Building and Running an Open edX Course - Cypress Release

Release

Contents

For Your Information

1.1 Read Me

The edX *Building and Running an Open edX Course* guide is created using RST files and Sphinx. You, the user community, can help update and revise this documentation project on GitHub:

```
https://github.com/edx/edx-documentation/tree/master/en_us/open_edx_course_authors/source
```

To suggest a revision, fork the project, make changes in your fork, and submit a pull request back to the original project: this is known as the GitHub Flow.

All pull requests need approval from edX. For more information, contact edX at docs@edx.org.

1.2 Preface

Course teams, researchers, developers, learners: the edX community includes groups with a range of reasons for using the platform and objectives to accomplish. To help members of each group learn about what edX offers, reach goals, and solve problems, edX provides a variety of information resources.

To help you find what you need, browse the edX offerings in the following categories.

- *The edX Partner Portal*
- *The Open edX Portal*
- *Release Announcements through the Open edX Portal*
- *System Status*
- *Resources for Course Teams*
- *Resources for Researchers*
- *Resources for Developers*
- *Resources for Open edX*
- *Resources for Learners*

All members of the edX community are encouraged to make use of any of the resources described in this preface. We welcome your feedback on these edX information resources. Contact the edX documentation team at docs@edx.org.

1.2.1 The edX Partner Portal

The edX Partner Portal is the destination for partners to learn, connect, and collaborate with one another. Partners can explore rich resources and share success stories and best practices while staying up-to-date with important news and

updates.

To use the edX Partner Portal, you must register and request verification as an edX partner. If you are an edX partner and have not used the edX Partner Portal, follow these steps.

1. Visit partners.edx.org, and select **Create New Account**.

2. Select **Request Partner Access**, then fill in your personal details.

3. Select **Create New Account**. You will receive a confirmation email with your account access within 24 hours.

Course Team Support in the edX Partner Portal

EdX partner course teams can get technical support in the edX Partner Portal. To access technical support, submit a support ticket, or review any support tickets you have created, go to partners.edx.org and select **Course Staff Support** at the top of the page. This option is available on every page in the Partner Portal.

1.2.2 The Open edX Portal

The Open edX Portal is the destination for all edX users to learn about the edX roadmap, as well as hosting, extending the edX platform, and contributing to Open edX. In addition, the Open edX Portal provides product announcements, the Open edX blog, and other rich community resources.

All users can view content on the Open edX Portal without creating an account and logging in.

To comment on blog posts or the edX roadmap, or subscribe to email updates, you must create an account and log in. If you do not have an account, follow these steps.

1. Visit open.edx.org/user/register.

2. Fill in your personal details.

3. Select **Create New Account**. You are then logged in to the Open edX Portal.

1.2.3 Release Announcements through the Open edX Portal

To receive and share product and release announcements by email, subscribe to announcements on the Open edX Portal.

1. Create an account on the Open edX Portal as described above.

2. Go to https://open.edx.org/announcements.

3. Under **Announcement Type** in the **Subscriptions** block, select the type of announcements that you want to receive through email.

4. Select **Save**.

You will now receive email messages when new announcements of the types you selected are posted.

Note: EdX partners can complete the same steps on the **Announcements** page in the edX Partner Portal.

1.2.4 System Status

For system-related notifications from the edX operations team, including outages and the status of error reports. On Twitter, you can follow @edxstatus.

Current system status and the uptime percentages for edX servers, along with the Twitter feed, are published on the edX Status web page.

1.2.5 Resources for Course Teams

Course teams include faculty, instructional designers, course staff, discussion moderators, and others who contribute to the creation and delivery of courses on edx.org or edX Edge.

edX101: Overview of Creating a Course

The edX101 course was built in Studio and is available for enrollment on edx.org. This course takes one to two hours to complete, and is designed to provide a high-level overview of the course creation and delivery process. It also highlights the extensive capabilities of the edX platform.

Documentation

Documentation for course teams is available on the docs.edx.org web page.

- Building and Running an edX Course is a comprehensive guide with concepts and procedures to help you build a course in edX Studio, and then use the Learning Management System (LMS) to run a course.

  When you are working in edX Studio, you can access relevant sections of this guide by selecting **Help** on any page.

- Using edX Insights describes the metrics, visualizations, and downloadable .csv files that course teams can use to gain information about student background and activity.

- edX Release Notes summarize the changes in each new version of deployed software.

- edX Open Learning XML Guide provides guidelines for building edX courses with Open Learning XML (OLX). Note that this guide is currently an alpha version.

These guides open in your web browser. The left side of each page includes a **Search docs** field and links to the contents of that guide. To open or save a PDF version, select **v: latest** at the lower right of the page, then select **PDF**.

Note: If you use the Safari browser, be aware that it does not support the search feature for edX documentation. This is a known limitation.

Email

To receive and share information by email, course team members can:

- Subscribe to announcements and other new topics in the edX Partner Portal or the Open edX Portal. For information about how to subscribe, see *Release Announcements through the Open edX Portal*.

- Join the openedx-studio Google group to ask questions and participate in discussions with peers at other edX partner organizations and edX staffers.

Wikis and Web Sites

The edX product team maintains public product roadmaps on *the Open edX Portal* and *the edX Partner Portal*.

The edX Author Support site for edX partners hosts discussions that are monitored by edX staff.

1.2.6 Resources for Researchers

Data for the courses on edx.org and edX Edge is available to the "data czars" at our partner institutions, and then used by database experts, statisticians, educational investigators, and others for educational research.

Documentation

The edX Research Guide is available on the docs.edx.org web page.

This guide opens in your web browser, with a **Search docs** field and links to that guide's contents on the left side of each page. To open or save a PDF version, select **v: latest** at the lower right of the page, and then select **PDF**.

Note: If you use the Safari browser, be aware that it does not support the search feature for edX documentation. This is a known limitation.

Email

To receive and share information by email, researchers can join the openedx-analytics Google group to ask questions and participate in discussions with peers at other edX partner organizations and edX staffers.

Wikis

The edX Analytics team maintains the Open edX Analytics wiki, which includes links to periodic release notes and other resources for researchers.

The edx-tools wiki lists publicly shared tools for working with the edX platform, including scripts for data analysis and reporting.

1.2.7 Resources for Developers

Software engineers, system administrators, and translators work on extending and localizing the code for the edX platform.

Documentation

Documentation for developers is available on the docs.edx.org web page.

- The edX Platform Developer's Guide includes guidelines for contributing to Open edX, options for extending the Open edX platform, using the edX public sandboxes, instrumenting analytics, and testing.

- Installing, Configuring, and Running the edX Platform provides procedures for getting an edX developer stack (Devstack) and production stack (Fullstack) operational.

- Open edX XBlock Tutorial guides developers through the process of creating an XBlock, and explains the concepts and anatomy of XBlocks.

- Open edX XBlock API Guide provides reference information about the XBlock API.

- edX Open Learning XML Guide provides guidelines for building edX courses with Open Learning XML (OLX). Note that this guide is currently an alpha version.

- edX Data Analytics API provides reference information for using the data analytics API to build applications to view and analyze learner activity in your course.

- edX Platform APIs provide reference information for building applications to view course information and videos and work with user and enrollment data.

Note: If you use the Safari browser, be aware that it does not support the search feature for edX documentation. This is a known limitation.

GitHub

These are the main edX repositories on GitHub.

- The edx/edx-platform repo contains the code for the edX platform.

- The edx/edx-analytics-dashboard repo contains the code for edX Insights.

- The edx/configuration repo contains scripts to set up and operate the edX platform.

Additional repositories are used for other projects. Our contributor agreement, contributor guidelines and coding conventions, and other resources are available in these repositories.

Email and IRC

To receive and share information by email, developers can join these Google groups to ask questions and participate in discussions with peers and edX staffers.

- For conversations about the code in Open edX, join edx-code.

- For conversations about running Open edX, join openedx-ops.

- For conversations about globalization and translation, join openedx-translation.

Additional Google groups are occasionally formed for individual projects.

Note: Please do not report security issues in public. If you have a concern, please email security@edx.org.

EdX engineers often monitor the Freenode #edx-code IRC channel.

Wikis and Web Sites

The Open edX Portal is the entry point for new contributors.

The edX Engineering team maintains an open Confluence wiki, which provides insights into the plans, projects, and questions that the edX Open Source team is working on with the community.

The pull request dashboard is a visualization of the count and age of the pull requests (PRs) assigned to teams at edX. Select the bars in this chart to get more information about the PRs.

The edx-tools wiki lists publicly shared tools for working with the edX platform, including scripts and helper utilities.

1.2.8 Resources for Open edX

Hosting providers, platform extenders, core contributors, and course staff all use Open edX. EdX provides release-specific documentation, as well as the latest version of all guides, for Open edX users. The following documentation is available.

- Open edX Release Notes provides information on the contents of Open edX releases.

- Building and Running an Open edX Course is a comprehensive guide with concepts and procedures to help you build a course in Studio, and then use the Learning Management System (LMS) to run a course.

  When you are working in Studio, you can access relevant sections of this guide by selecting **Help** on any page.

- Open edX Learner's Guide helps students use the Open edX LMS to take courses. This guide is available on the docs.edx.org web page. Because learners are currently only guided to this resource through the courseware, we encourage course teams to provide learners with links to this guide as needed in course updates or discussions.

- Installing, Configuring, and Running the edX Platform provides information about installing and using Devstack and Fullstack.

- The edX Platform Developer's Guide includes guidelines for contributing to Open edX, options for extending the Open edX platform, using the edX public sandboxes, instrumenting analytics, and testing.

- Open edX XBlock Tutorial guides developers through the process of creating an XBlock, and explains the concepts and anatomy of XBlocks.

- Open edX XBlock API Guide provides reference information on the XBlock API.

- EdX Open Learning XML Guide provides guidelines for building edX courses with Open Learning XML (OLX). Note that this guide is currently an alpha version.

- EdX Data Analytics API provides reference information for using the data analytics API to build applications to view and analyze learner activity in your course.

- EdX Platform APIs provide reference information for building applications to view course information and videos and work with user and enrollment data.

Note: If you use the Safari browser, be aware that it does not support the search feature for edX documentation. This is a known limitation.

1.2.9 Resources for Learners

Documentation

The EdX Learner's Guide and the Open edX Learner's Guide are available on the docs.edx.org web page. Because learners are currently only guided to this resource through the courseware, we encourage course teams to provide learners with links to these guides as needed in course updates or discussions.

In a Course

All edX courses have a discussion forum where you can ask questions and interact with other students and with the course team: select **Discussion**. Many courses also offer a wiki for additional resources and materials: select **Wiki**.

Other resources might also be available, such as a course-specific Facebook page or Twitter feed, or opportunities for Google Hangouts. Be sure to check the **Course Info** page for your course as well as the **Discussion** and **Wiki** pages.

From time to time, the course team might send email messages to all students. While you can opt out of these messages, doing so means that you can miss important or time-sensitive information. To change your preferences for course email, select **edX** or **edX edge** at the top of any page. On your dashboard of current courses, locate the course and then select **Email Settings**.

From edX

To help you get started with the edX learning experience, edX offers a course (of course!). You can find the edX Demo course on the edX web site. EdX also maintains a list of frequently asked questions and answers.

If you still have questions or suggestions, you can get help from the edX support team: select **Contact** at the bottom of any edX web page or send an email message to info@edx.org.

For opportunities to meet others who are interested in edX courses, check the edX Global Community meetup group.

1.3 Change Log

1.3.1 August 2015

Date	Change
12 August 2015	Added the *Qualtrics Survey Tool* topic.

1.3.2 July 2015

Date	Change
30 July 2015	Updated the *Working with Problem Components* and *Numerical Input Problem* sections to clarify how the **Randomization** setting is used.
28 July 2015	Updated the *Answer Data* section to remove references to features on the Analytics page of the Instructor Dashboard.
17 July 2015	Added the *Best Practices for Open Response Assessments* and *How Open Response Assessments Are Scored* sections.
	Updated this guide to use the course team "Admin" and "Staff" role names consistently. For more information, see the *Staffing* section.
8 July 2015	Added the *Poll Tool* and *Survey Tool* sections.
1 July	Several additions were made to provide information about using feedback and hints in common problems. • *Adding Feedback and Hints to a Problem* • *Use Feedback in a Checkbox Problem* • *Use Hints in a Checkbox Problem* • *Use Feedback in a Dropdown Problem* • *Use Hints in a Dropdown Problem* • *Use Feedback in a Multiple Choice Problem* • *Use Hints in a Multiple Choice Problem* • *Use Feedback in a Numerical Input Problems* • *Use Hints in a Numerical Input Problem* • *Use Feedback in a Text Input Problem* • *Use Hints in a Text Input Problem*

1.3.3 Apr-Jun 2015

Date	Change
22 Jun 2015	Updated the *Accessibility Best Practices for Developing Course Content* section.
16 Jun 2015	Added the *Creating a Custom Course* section.
10 Jun 2015	Added the *Report Learners Not Yet Enrolled* section.
8 Jun 2015	Updated the *Add a Course Update* section to include information about sending notifications to the edX mobile applications.
	Added the list of Mobile-Ready Problem Types.
	Added the *Setting Up Course Certificates* section.
	Added *Manage Course Fees*.
	Added *Notes Tool* topic.
28 May 2015	Updated this document to latest version.

1.3.4 Jan-Mar 2015

Date	Change
24 Feb 2015	Initial release of document for the Open edX Birch release.

1.4 edX Browser Support

The edX Platform runs on the following browsers.

- Chrome
- Safari
- Firefox
- Internet Explorer

Note: If you use the Safari browser, be aware that it does not support the search feature for the edX documentation. This is a known limitation.

The edX Platform is routinely tested and verified on the current and previous version of each of these browsers. We generally encourage the use of and fully support only the latest version.

This information is updated as new major operating system and browser versions are released. All point releases are supported unless noted; occasional exceptions are based on specific bug fixes or feature updates.

1.4.1 edX Learning Management System

The following table shows operating system and browser support for the edX learning management system (LMS), which learners and course teams use to interact with course content.

	Chrome	Safari	Firefox	IE 11	IE 10
Windows 8	Yes	N/A	Yes	Yes	Yes
Mac OSX Mavericks or Yosemite	Yes	Yes	Yes	N/A	N/A

For more information about the LMS, see Building and Running an edX Course.

1.4.2 edX Studio

The following table shows operating system and browser support for edX Studio, which course teams use to build a course.

	Chrome	Safari	Firefox	IE 11	IE 10
Windows 8	Yes	N/A	Yes	Provisional	Provisional
Mac OSX Mavericks or Yosemite	Yes	Yes	Yes	N/A	N/A

For more information about Studio, see Building and Running an edX Course.

1.4.3 edX Insights

The following table shows operating system and browser support for edX Insights, which course teams use to review and download data about their courses and learners.

	Chrome	Safari	Firefox	IE 11	IE 10
Windows 8	Yes	N/A	Yes	Provisional	Provisional
Mac OSX Mavericks or Yosemite	Yes	Yes	Yes	N/A	N/A

For more information about edX Insights, see Using edX Insights.

Getting Started

2.1 Exploring Your Dashboard, Settings, and Profile

After you create an edX account, you can view a list of your current courses, change your account settings, or create a profile. You can access course, account, or profile information from any edX page, whether you are in a course or browsing the course catalog.

- Your *dashboard* gives you access to course information, such as start and end dates, email settings, and certificates. To access your dashboard at any time, select your username in the upper right corner of any edX page.

- The *Account Settings* page allows you to change settings such as your email address, education level, and country or region, and to link your edX account to a Facebook or Google account. To access your account settings at any time, select the arrow next to your username in the upper right corner of any edX page, and then select **Account Settings**.

- On your *profile page*, you can create a profile that includes an image and biographical information. To access your profile at any time, select the arrow next to your username in the upper right corner of any edX page, and then select **My Profile**.

2.1.1 Exploring the Learner Dashboard

When you create an edX account or enroll in an edX course, you automatically go to your dashboard. You can also access your dashboard at any time by selecting your username in the upper right corner of any edX page.

Your dashboard contains important information about your courses. You can take several actions on your dashboard.

- Access your current and archived courses.

  To access a current or archived course, select **View Course** or **View Archived Course**. Note that archived courses may provide limited access to content.

- See when courses start or end.

  Course start and end dates appear below the name of the course.

  - If a course has not yet started, you see the course start date.

  - If a course has started but not ended, you see the course end date.

  - If a course has ended, you see the course end date.

- Change your course email settings.

1. Select the Options icon for the course, and then select **Course emails**.

2. Select or clear the **Receive course emails** check box, and then select **Save Settings**.

- Unenroll from a course.

  To unenroll, select the Options icon for the course, select **Unenroll**, and then select **Unenroll** in the confirmation dialog box.

- View your grades in courses that you have completed.

  Your final grade appears under the name of the course.

- Download a certificate.

  To download a certificate, select **Download Your Certificate (PDF)** or **Download Your ID Verified Certificate (PDF)**. You can then print the PDF certificate.

2.1.2 Exploring the Account Settings Page

When you create an account on edX, some basic information is required, including your email address and your name. You can also provide additional, optional information when you create your account, such as the level of education you have completed. Course team members can access this information to find out more about the learners who enroll in their courses. This information also helps edX increase the quality and quantity of our courses.

View or Change Basic Account Information

Basic account information includes the following information. This information is required for every account on edX.

- **Username**: The name that identifies you on edx.org. Note that you cannot change your edX username.
- **Full Name**: The name that appears on your edX certificates. Other learners cannot see your full name.
- **Email Address**: The email address you use to sign in to edX. You may receive communications from edX and your courses at this address.
- **Password**: Your password on edx.org. To reset your password, select **Reset Password**. EdX then sends a message to the email address in the **Email Address** field. You select the link in the message to finish resetting your password.
- **Language**: The language that the edX site uses during your visits. The edX site is currently available in a limited number of languages.
- **Country or Region**: The country or region that you live in.

To view or change this information, follow these steps.

Note: You cannot change your edX username.

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1. On any edX page, select the arrow next to your username in the upper right corner, and then select **Account Settings**.

2. On the **Account Settings** page, locate the **Basic Account Information (required)** section, and then make your changes.

EdX saves your changes automatically.

Specify Additional Information

Additional account information is optional and includes the following information.

- **Education Completed**: The highest level of education that you have completed.
- **Gender**: The gender you identify as.
- **Year of Birth**: The year that you were born.
- **Preferred Language**: The language that you prefer to communicate in.

To view or change this information, follow these steps.

1. On any edX page, select the arrow next to your username in the upper right corner, and then select **Account Settings**.
2. On the **Account Settings** page, locate the **Additional Information (optional)** section, and then make your changes.

EdX saves your changes automatically.

Link or Unlink a Social Media Account

You can link your edX account to your Facebook or Google account. If you link your accounts, you can sign in to edX automatically by signing in to Facebook or Google.

To link your accounts, follow these steps.

1. On any edX page, select the arrow next to your username in the upper right corner, and then select **Account Settings**.
2. In the **Connected Accounts** section, select **Link** next to either Facebook or Google.

   If you want to unlink your edX account from your Facebook or Google account, select **Unlink** next to either Facebook or Google in the **Connected Accounts** section.

2.1.3 Exploring the Profile Page

Your edX profile allows you to share information about yourself with the edX community. Your profile can include an image that identifies you on the edX site as well as your location and other biographical information. Course teams and other learners in your courses can view your profile.

You can share a limited profile or a full profile.
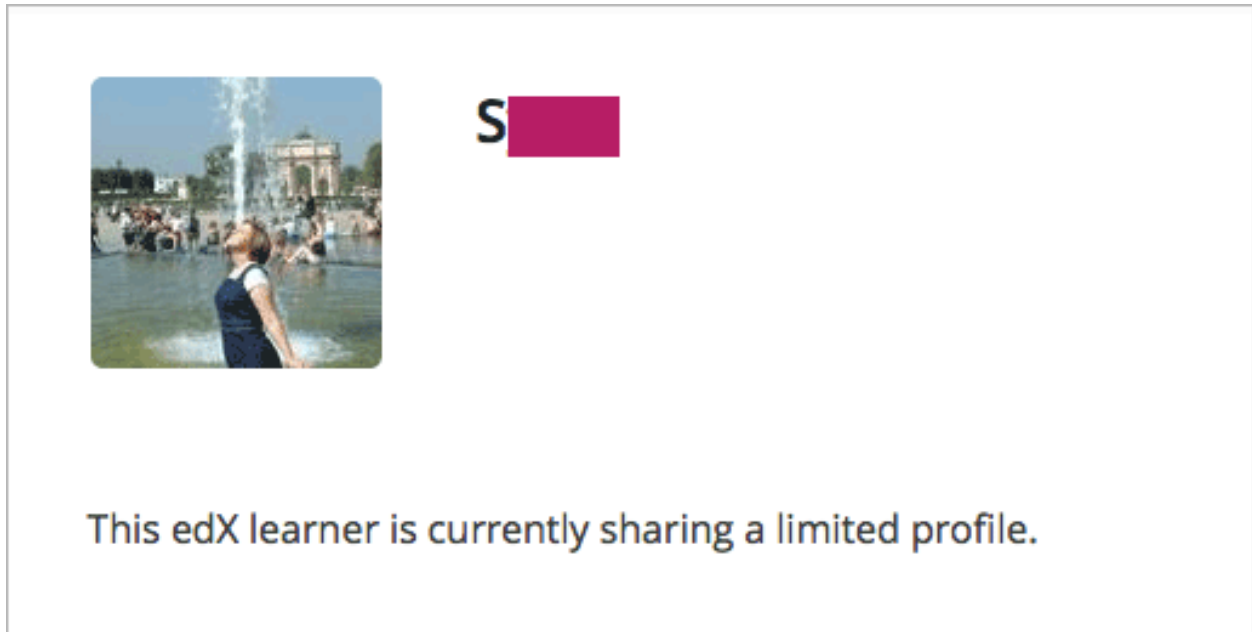
Note: Learners under 13 years of age can only share a limited profile.
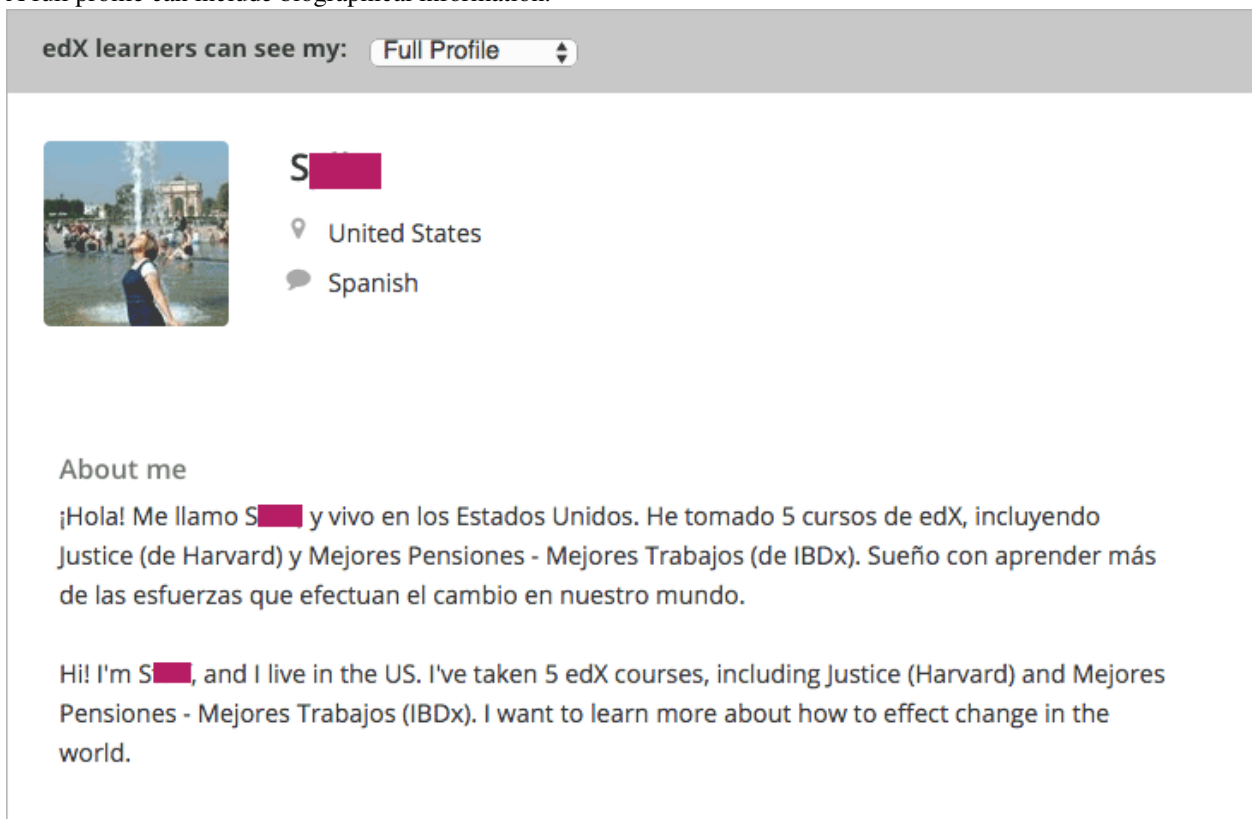
A limited profile can include only your username and an image.

A full profile can include biographical information.

Create or Edit a Limited Profile

A limited profile includes only your username and, optionally, an image.

To create or edit a limited profile, follow these steps.

1. On any edX page, select the arrow next to your username in the upper right corner, and then select **My Profile**.

2. On your profile page, locate **edX learners can see my** in the upper left corner of the page, and then select **Limited Profile**.

3. (optional) Add an image that you want to associate with your edX username. Your image must be a .gif, .jpg, or .png file. The image must be between 100 bytes and 1 MB in size. If you do not add an image, the placeholder image appears as your profile image.

   (a) Move your cursor over the placeholder image, and then select **Upload Image**.

   (b) In the dialog box, select the image file that you want, and then click **Open**.

   To change or remove your profile image, move your cursor over your image, and then select either **Change Image** or **Remove**. When you remove your profile image, the placeholder image appears as your profile image.

EdX saves your changes automatically.

Create or Edit a Full Profile

Note: You must specify your year of birth on the **Account Settings** page before you share a full profile. If you are under age 13, you can only share a limited profile.

A full profile can include the following information. Your username and country or region are required.

- Your username.

- An image that you select to identify you on the edX site.

- Your country or region.

- Your preferred language.

- A paragraph about yourself. You might include your interests, goals, or other information that you want to share. This paragraph can contain up to 3000 characters.
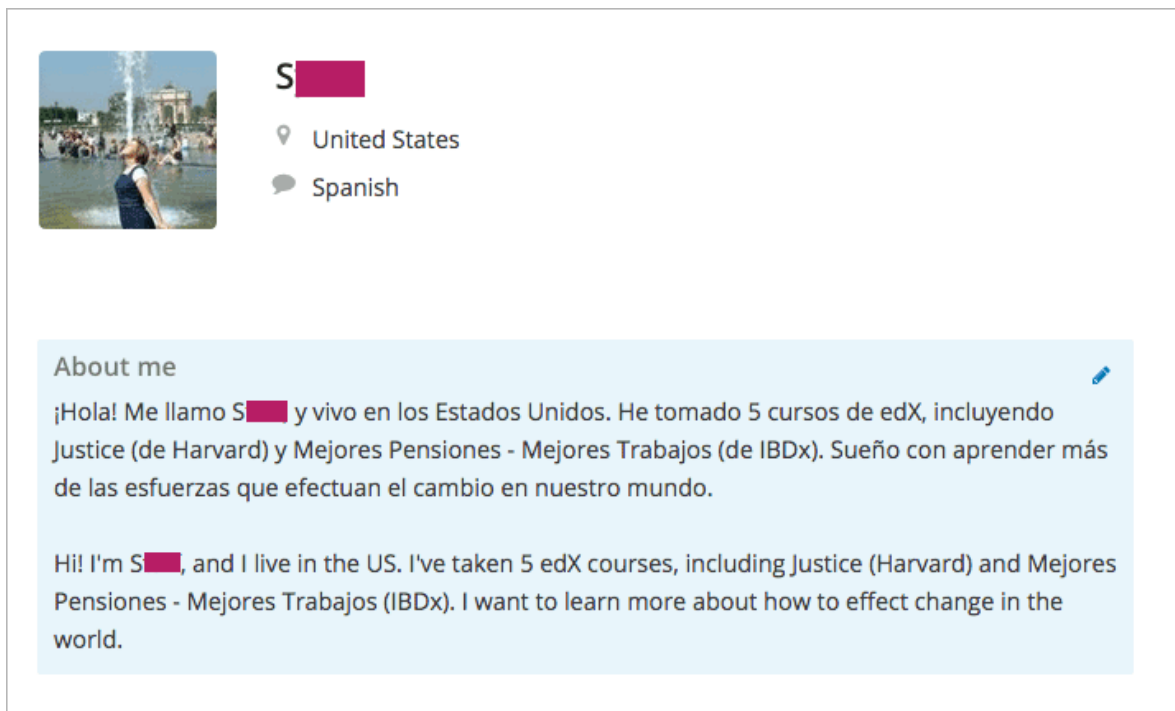
To create or edit your profile, follow these steps.

1. On any edX page, select the arrow next to your username in the upper right corner, and then select **My Profile**.

2. Locate **edX learners can see my** in the upper left corner of the page, and then select **Full Profile**.

3. On your profile page, move your cursor over the information that you want to add or change.

   If you have not added information to the field, the field appears highlighted and surrounded by a dashed line.
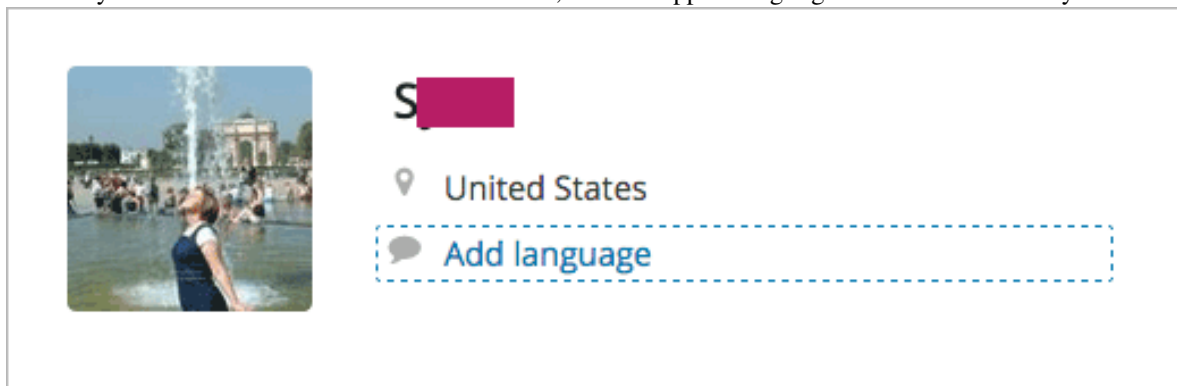
   If the field already has information, the field appears highlighted, and a pencil icon appears in the upper right corner.

4. Move your cursor inside the field, and then either enter text in the field or select a different option from a list.

EdX saves your changes automatically.

Note: If you change the profile type selection from **Full Profile** to **Limited Profile**, your location, language, and descriptive paragraph are not visible on your profile page. However, this information is saved. To make this information visible again, select **Full Profile**.

View Another Learner's Profile

You view other learners' profiles through the course discussions.

1. On the **Discussion** page, select the username of any learner in a post, a response, or a comment.

2. When the **Active Threads** page for that learner opens, select the learner's username in the upper left corner of the page.

The following image shows a learner's username in a post, the learner's username on the **Active Threads** page, and the learner's profile page.
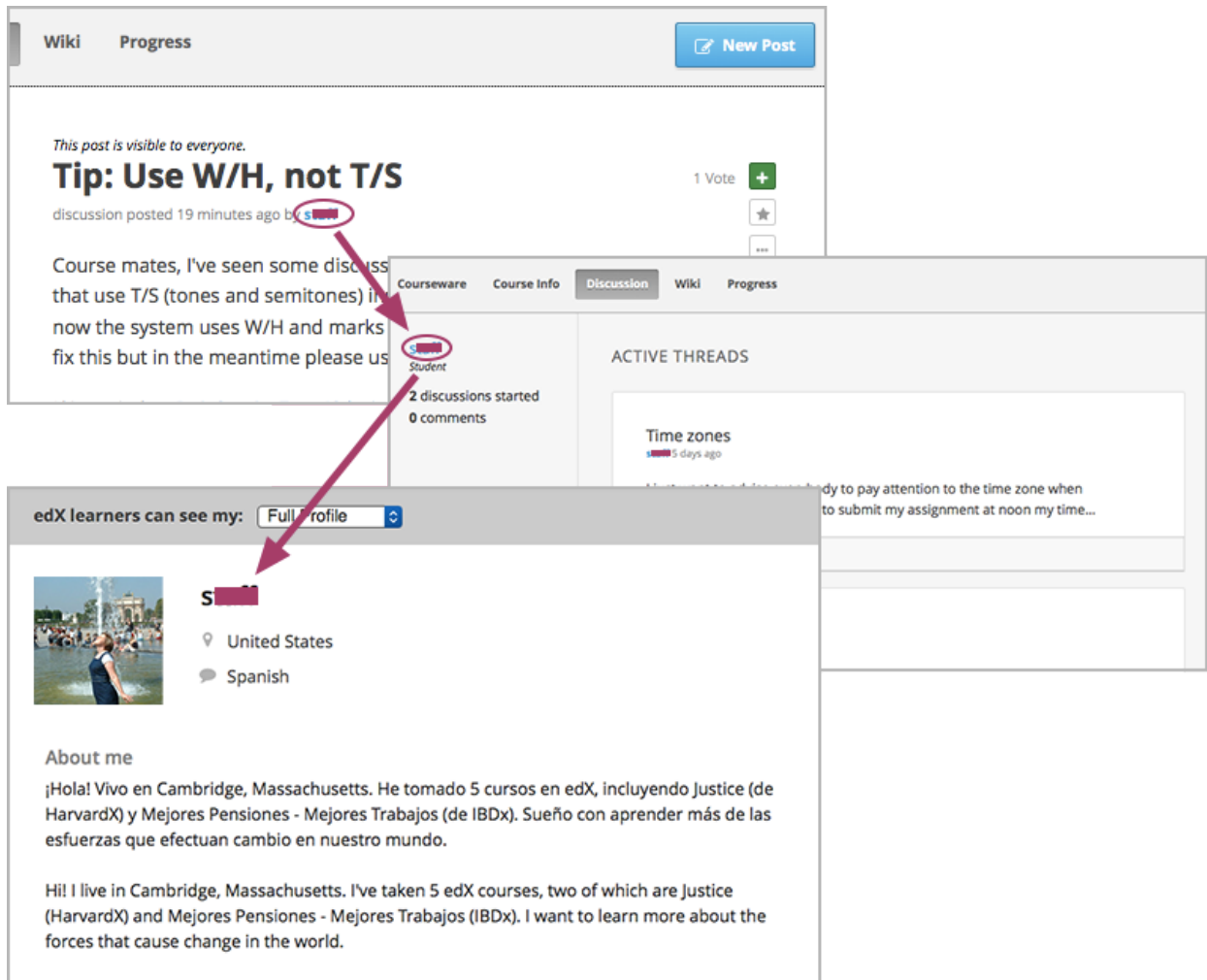
2.2 Getting Started with Studio

2.2.1 Overview

This chapter describes the tools you use to build an edX course, and how to create your first course:

- *What is Studio?*
- *Create Your First Course*

2.2.2 What is Studio?

Studio is the edX tool you use to build your courses.

You use Studio to create course content, problems, videos, and other resources for students.

With Studio, you can also manage your schedule and course team, set grading policies, publish your course, and more.

You use Studio directly through your browser. You do not need any additional software.

2.2.3 Create Your First Course

When you receive notice that you can create courses, log in to Studio.

You see the following page, which is your **My Courses** dashboard:

1. Click **Create Your First Course**.

2. Enter course information as needed and click **Create**.

Note: Enter new course information carefully. This information becomes part of the URL for your course. Because this information becomes part of your course URL, the total number of characters in the following three fields must be 65 or fewer.

- For **Course Name**, enter the title of your course. For example, the name may be "Sets, Maps and Symmetry Groups". Use title capitalization for the course title.

- For **Organization**, enter the name of your institution. Do not include whitespace or special charac-

ters.

- For **Course Number**, enter both a subject abbreviation and a number. For example, for public health course number 207, enter **PH207**. For math course 101x, enter **Math101x**. Do not include whitespace or special characters in the course number.

3. Click **Save.**

Your new course opens to the **Course Outline** page. Because you haven't created any content yet, this page is empty.

In your browser's address bar, notice that the URL of your course includes the course organization, number, and course run.

The rest of this documentation describes how you now build and run your course.

Accessibility Best Practices Guidance for Content Providers

The core mission of edX is to expand access to education for everyone. We expect courses and course content developed on the Open edX platform to be accessible to everyone, regardless of any physical limitation that they might have.

In furtherance of our mission, edX has entered into an agreement with the United States, under which we have agreed to incorporate accessibility into our website (http://www.edx.org), mobile applications, and platform to meet a wide variety of requirements of learners with disabilities and to enable content providers to develop accessible course content.

The topics in this section are intended to help course teams understand how to develop courses that can serve the widest possible audience.

Note: Course teams should familiarize themselves with this best practices guidance and distribute it to any members of their teams who are responsible for creating course content.

3.1 What Is The EdX Accessibility Best Practices Guidance Based On?

EdX measures and evaluates accessibility using the World Wide Web Consortium's Web Content Accessibility Guidelines (WCAG) 2.0 (Dec. 11, 2008). All features that are merged into edX repositories are expected to conform to Level AA of this specification and satisfy the requirements outlined in the edX Website Accessibility Policy.

In addition, our guidance is based on principles of universal design (usable by all, to the greatest extent possible, without the need for adaptation or specialized design). Course teams who build courses based on these principles create an inclusive experience that considers the diverse set of learning styles and needs of all learners, including learners with disabilities, learners whose native language is not English, learners with technical issues such as low bandwidth internet or no access to audio.

For the purposes of this guidance, we assume that end users are equipped with the appropriate adaptive technology and compatible software. To supplement the accessibility you can achieve within the Open edX platform, we recommend that you engage the resources available at your institution to support learners with disabilities. Most institutions offer disability support services and information technology resources that provide accessibility advice and support. These professionals are trained in making disability accommodation decisions and can advise you on what accommodations may be appropriate in light of the goals of the course and the instructional methodologies employed.

For more information, see the following topics.

- *Supporting Learners with Diverse Needs*

- *Accessibility Best Practices for Developing Course Content*

3.2 Supporting Learners with Diverse Needs

Almost one fifth of the world's population has some kind of disability. Online courses can reduce many barriers to education for these learners by providing access to courses from any location, at any time, and through the use of assistive technologies.

EdX is dedicated to creating a platform that is not only itself accessible, but also enables course content creators to create accessible content. If you encounter platform issues that you believe might affect your ability to provide accessible course content, please contact us at accessibility@edx.org. We welcome any comments and questions.

Note: Use of authoring tools other than those provided by edX might result in inaccessible course content. However, for clarity, use of edX authoring tools does not ensure that your course content will be accessible.

3.2.1 Who Are Our Learners?

In the following sections, we provide guidance on creating and delivering course content that allows students to use built-in accessibility functionality (such as text-to-speech and magnification features), assistive technologies, and alternative formats. These practices consider learners with diverse needs, such as those in the following list.

- Blind learners who use a screen reader, which reads page text aloud, or a Braille display device, which renders page text in refreshable Braille.
- Low-vision learners who use screen magnification software to enlarge or modify the contrast of text and other onscreen content.
- Learners with vision impairments, such as difficulty seeing in low-light conditions, who modify their browser or operating system to change background colors and text settings to make text easier to read.
- Learners with learning disabilities, such as dyslexia, who use text-to- speech technology that reads page content aloud.
- Physically disabled learners who control their computers using switching devices, voice recognition software, or eye gaze-activated technology instead of mouse devices or keyboards.
- Learners who modify their operating system settings to make the mouse or keyboard easier to use.
- Learners with hearing impairments who cannot access audio content and need the equivalent information in an alternative format, such as captions.

3.2.2 Removing Barriers to Learning

EdX highly recommends that you implement the best practices in this document and in other resources. If you cannot easily address any of these barriers to providing accessible course content, edX recommends that you consult with resources at your organization such as Disability Services, or assistive technology and accessibility specialists.

The following resources might also assist you in producing accessible course content.

- User Agent Accessibility Guidelines (UAAG) 1.0
- Authoring Tool Accessibility Guidelines (ATAG) 2.0
- WAI-ARIA (Accessible Rich Internet Applications)
- WCAT2ICT
- EPUB 3.0
- DAISY Consortium

- MathJax
- MathML

While your ability to support students in the MOOC context might be different from supporting on-campus students, we encourage you to develop a plan to respond to students who inform you of accessibility barriers to learning. However, given the large numbers of learners enrolling in many of the courses, you will quickly see how important it is to address accessibility concerns when creating a course.

3.3 Accessibility Best Practices for Developing Course Content

EdX is dedicated to creating a platform that is not only itself accessible, but also enables course content creators to create accessible content. If you encounter platform issues that you believe might affect your ability to provide accessible course content, please contact us at accessibility@edx.org. We welcome any comments and questions.

Note: Use of authoring tools other than those provided by edX might result in inaccessible course content. However, for clarity, use of edX authoring tools does not ensure that your course content will be accessible.

- *Make Sure Your Course Content is Perceivable*
- *Make Sure Your Course Content is Understandable*
- *Use Best Practices for Describing Images*
- *Create Accessible Course Materials*
- *Use Best Practices for Mathematical Content*
- *Use Best Practices for Custom Content Types*
- *Create Accessible Media*
- *Use Best Practices for HTML Markup*
- *Apply Universal Design for Learning*

3.3.1 Make Sure Your Course Content is Perceivable

The WCAG 2.0 guidelines are organized around several principles, one of which is that web content must be perceivable. That is, information and user interface components must be presentable to users in ways they can perceive; it cannot be invisible to all of their senses. In almost all cases, this means that the information should be available as text, which can be rendered or transformed into a format that can be perceived.

To produce content that is perceivable by all learners, follow these guidelines.

Include Text Alternatives for Non-Text Content

For any non-text content, provide text alternatives so that the content can be changed into other forms that people need, such as large print, braille, speech, symbols, or simpler language.

For non-text tests or exercises that would be invalid if presented in text, provide text alternatives that at least provide descriptions of the non-text content. Make sure that all images have useful alternative text that screen readers and other assistive technologies can read. For more information, see *Use Best Practices for Describing Images*.

Provide Alternatives for Time-Based Media

For time-based media, including pre-recorded audio or video content, provide alternative equivalent information, such as captions, audio description or pre-recorded sign language interpretation. For more information, see *Create*

Accessible Media.

Make Sure Your Content is Adaptable

Design your course content so that it can be presented in different ways without losing information or structure. If your content includes specific information, structure, and relationships (such as sequence) that is conveyed through presentation, make sure the same information, structure, and relationships can be programmatically determined or are available in text. HTML is an ideal format in which to publish course content, because it provides semantic elements with implied roles, states, and properties. Users of assistive technologies rely on such semantic elements to effectively and efficiently consume and navigate content. Publish your content in HTML whenever possible.

Make sure your course content does not rely solely on sensory characteristics such as shape, size, visual location, orientation, or sound to be understood by learners.

Make It Easier for Learners to See and Hear Content

Make the default presentation as easy to perceive as possible, especially by making it easier for learners to distinguish foreground information from the background, in both visual and audio elements.

For visual elements, techniques include making sure the fonts you use are readable, and that there is sufficient contrast between the foreground and background. Do not use color as the sole means of visually distinguishing an element or conveying critical information. If you must create images that contain text, make sure that the text has a font size of at least 14 points and has good contrast with the background. Images of text cannot be scaled or color corrected as effectively as HTML text. Whenever possible, use the default font and color defined in the edX platform, which was designed to be easy to read. If you choose to override default font colors, make sure that the foreground and background colors have sufficient contrast.

For audio elements, make sure that foreground sounds are sufficiently louder than background sounds.

3.3.2 Make Sure Your Course Content is Understandable

Make sure your course content is readable and understandable. EdX courses have a global and diverse audience, including learners whose native language is not the language in which you created your course, as well as learners who have a disability that affects reading, such as dyslexia or a visual impairment.

Learners will be better positioned to access concepts in your content if you write in clear, straightforward language and the content is well structured.

Write Simply and Clearly

Avoid jargon. If unfamiliar words or phrases are relevant to the subject, explain them when they are first used, and include a glossary with your course materials. When you use an abbreviation or acronym, provide the full phrase the first time it appears. For example, "World Health Organization (WHO)."

The Center for Plain Language provides detailed resources on writing clearly and concisely, in language appropriate for your content and target audience.

Make Your Course Easy to Navigate

One aspect of making your course understandable is making sure that learners can easily grasp its structure, find content, and determine where they are within the course.

Name your course sections, subsections, units, components, and discussion topics in a consistent way, and make sure the names are useful and easy to skim. Make an element's name descriptive of its content, and put important keyword information first in the name. These names are used in navigation menus, page headings, and section headings; they are signposts that help learners to navigate your course and read course content.

When you create written learning resources, break text into sections using HTML elements such as headings, paragraphs, and lists. Long blocks of unbroken text are a barrier to most readers. Segmented content is more inviting and is easier to navigate and search. See *Use Best Practices for HTML Markup* for guidance on creating accessible HTML.

When you provide links to external materials, use link text that clearly explains the link destination (for example, "Review the Course Syllabus"). Avoid using constructs such as "Review the Course Syllabus here", with only the word "here" serving as link text. For links that point to documents rather than web pages, include the document type in the link. For example, "Supplemental Reading for Week 1 (EPUB)". Screen reader users frequently browse lists of links, or navigate web pages by moving from one link to the next. Ensuring that link text is understandable without surrounding context is important.

3.3.3 Use Best Practices for Describing Images

When you use images (including diagrams, maps, charts, or icons) in your course content, you must provide text alternatives that provide information equivalent to the visual content, or that identify the purpose of such non-text content.

The text alternative for an image depends on the image's context and purpose, and might not be a simple description of the image's visual characteristics. In general, for every image, edX recommends that you provide a text alternative that provides the equivalent information that a sighted learner would obtain from viewing the image. If the image contains words that are important for understanding the content, include the words in the text alternative. If the image itself is being used as a link, the text alternative should describe the destination or action that will be performed when the link is activated.

The primary mechanism for providing a text alternative for an image in HTML is the `alt` attribute. The text value of this attribute is what screen reader users hear when they encounter the image in your content.

Note: All images *must* include an `alt` attribute. There are some cases, noted below, when an empty `alt` attribute (`alt=""`) is desirable. However, the `alt` attribute must never be omitted.

Create useful and meaningful text alternatives for images in your course by following these guidelines for particular situations.

- *Images That Are Links or Controls*
- *Images That Contain Text*
- *Images That Contribute Meaning or Additional Context to the Page*
- *Graphs or Complex Visual Representations of Information*
- *Images With Unknown Descriptions at The Time of Publication*
- *Non-Informative Images*
- *Information Graphics (Charts, Diagrams, Illustrations)*
- *Accessible Images Resources*

Images That Are Links or Controls

If your image serves as a link to additional content or is an interactive form control such as a button, the value of the `alt` attribute should describe the destination of the link or the action that will be performed when the user clicks the image. For example, if a linked image of an envelope opens an email program to send an email, a useful text alternative is "Send message", rather than "Envelope."

Images That Contain Text

If your image contains text, the `alt` attribute would typically consist of exactly the same text as is contained in the image. However, there are a couple of conditions when having an empty `alt` attribute (alt="") is the preferred solution.

If the text contained in the image is also available in nearby HTML, or otherwise accessible text, including it in the `alt` attribute would be redundant. In this case, setting an empty `alt` attribute (alt="") is acceptable. Doing so effectively "hides" the image from screen reader users.

Note: All images *must* include an `alt` attribute so do not omit the `alt` attribute entirely. If the `alt` attribute is omitted entirely, screen readers will read the value of the `src` attribute (the path to the image on a web server) as a fallback. This is rarely helpful to the user and often results in a poor user experience.

If the text contained in the image is for decorative purposes only and adds no value to the content of the page, an empty `alt` attribute is also acceptable.

Images That Contribute Meaning or Additional Context to the Page

If the image is a simple graphic or photograph that provides additional context to the surrounding content, the `alt` attribute should briefly describe the image in a way that conveys that context.

Consider the following examples of meaningful alt attributes for a photo of the famous stone bridge, Ponte Vecchio in Florence, Italy.

- For a representative image of the bridge included on a page about Florence, a meaningful `alt` attribute would be "Photo of Ponte Vecchio, a famous bridge and shopping center in Florence, Italy."

- If the context of the page is about the bridge itself a meaningful `alt` attribute would be more specific: "Photo of Ponte Vecchio showing its three stone arches which span the Arno River."

- For a technical diagram, or illustration, on a page about the construction of the bridge the `alt` attribute would include the details conveyed visually, such as dimensions and materials used: "The Ponte Vecchio is a stone bridge with three arches and a span-to-rise ratio of 5 to 1."

- For a map intended to provide directions to the bridge, the `alt` attribute would provide directions as text.

Graphs or Complex Visual Representations of Information

If the image is a graph or represents a complex piece of information, include the information contained in the image as accessible text adjacent to the image, or provide a link to the information. The `alt` attribute should convey a summary of what the complex image conveys visually. For example, a line graph that represents the price of a stock over time might be "The price of the stock rises from $45 in January of 2015 to over $76 in June of 2015 with a significant drop of 30% during the month of March."

Consider using a caption to display long descriptions so that the information is available to all learners. In the following example, the image element includes the short description as the `alt` attribute and the paragraph element includes the long description.

```
<img src="image.jpg" alt="Photo of Ponte Vecchio">
<p>Photo of Ponte Vecchio showing its three stone arches and the Arno river</p>
```

Alternatively, provide long descriptions by creating an additional unit or downloadable file that contains the descriptive text and providing a link to the unit or file below the image.

```
<img src="image.jpg" alt="Illustration of Ponte Vecchio">
<p><a href="description.html">Description of Ponte Vecchio Illustration</a></p>
```

Images With Unknown Descriptions at The Time of Publication

If a suitable text alternative is unknown at the time of publication (for example, a webcam image that updates every 10 minutes) provide an `alt` attribute that includes as much useful information as possible. For example, "Traffic on Interstate 90 at 5:45 PM June 26, 2015."

Non-Informative Images

Images that do not provide information, including purely decorative images, do not need text descriptions. For example, an icon that is followed by link text that reads "Course Syllabus (EPUB)" does not need alternative text.

For non-informative images that should be skipped by screen reading software, include an `alt` attribute but leave it with an empty value (also known as a NULL `alt` attribute).

```
<img src="image.jpg" alt="">
```

Note: While it is appropriate to have an empty `alt` attribute, it is never acceptable to omit the `alt` attribute entirely. If image elements do not include an `alt` attribute at all, a screen reader will read the path to the image, or, in the case of a linked image, announce the linked URL. This is rarely helpful to the user and often results in a poor user experience.

Information Graphics (Charts, Diagrams, Illustrations)

Graphics are helpful for communicating concepts and information, but they can present challenges for people with visual impairments. For example, a chart that requires color perception or a diagram with tiny labels and annotations will likely be difficult to comprehend for learners with color blindness or low vision. All images present a barrier to learners who are blind.

EdX recommends that you follow these best practices for making information graphics accessible to visually impaired students.

- Avoid using only color to distinguish important features of an image. For example, on a line graph, use a different symbol or line style as well as color to distinguish the data elements.

- Whenever possible, use an image format that supports scaling, such as .svg, so that learners can employ zooming or view the image larger. Consider providing a high-resolution version of complex graphics that have small but essential details.

- For every graphic, provide a text alternative that provides the equivalent information that a sighted learner would obtain from viewing the graphic. For charts and graphs, a text alternative could be a table displaying the same data. See *Use Best Practices for Describing Images* for details about providing useful text alternatives for images.

Accessible Images Resources

- W3C Resources on Alternative Text for Images

- W3C WAI Images Tutorial

- HTML5 - Requirements for providing text to act as an alternative for images

- WebAim provides general guidance on the appropriate use of alternative text for images.

- The DIAGRAM Center, established by the US Department of Education (Office of Special Education Programs), provides guidance on ways to make it easier, faster, and more cost effective to create and use accessible images.

3.3.4 Create Accessible Course Materials

The source teaching materials for your course might exist in a variety of formats. For example, your syllabus might be in MS Word, your presentation slides in MS PowerPoint, and your textbooks in publisher-supplied PDF. It is important to consider how accessible these supplemental materials are before making them available through your course.

Carefully consider the document format you choose for publishing your course materials, because some formats support accessibility better than others. Whenever possible, create course materials in HTML format, using the tools available to you in edX Studio. When you make digital textbooks (ebooks) available within your course, ask digital book publishers for books in either DAISY or EPUB 3 format, or both. Both of these digital book formats include unparalleled support for accessibility. However, simply supporting accessibility does not always mean a document will be accessible. When you source ebooks from third parties, it helps to ask the right questions about accessibility.

- Can screen readers read the document text?

- Do images in the document include alternative text descriptions?

- Are all tables, charts, and math provided in an accessible format?

- Does all media include text equivalents?

- Does the document have navigational aids, such as a table of contents, index, headings, and bookmarks?

Natively accessible formats like those mentioned above might not always be available options. Other popular document formats included in edX courses include PDF, Microsoft Word, Excel, or Powerpoint. Many of the same accessibility techniques and principles that apply to authoring web content apply to these document formats as well.

- Images must have descriptive text associated with them.

- Documents should be well structured.

- Information should be presented in a logical order.

- Hyperlinks should be meaningful and describe the destination.

- Tables should include properly defined column and row headers.

- Color combinations should be high contrast.

The information that follows provides some practical guidance to publishing accessible course materials in popular formats.

- *Accessible Course Materials Resources*
- *Creating Accessible PDF Documents*
- *Creating Accessible Word Documents*
- *Creating Accessible Excel Documents*
- *Creating Accessible Powerpoint Documents*

Accessible Course Materials Resources

- The DAISY Consortium is a global partnership of organizations that supports and helps to develop inclusive publishing standards.

- The EPUB 3 format is widely adopted as the format for digital books.

Creating Accessible PDF Documents

Not all ebooks are available in DAISY or EPUB 3 format. Portable Document Format (PDF) is another common format for course materials, including textbooks supplied by publishers. However, converting materials to PDF documents can create accessibility barriers, particularly for learners with visual impairments. Such learners rely on the semantic document structure inherently available in HTML, DAISY, or EPUB 3 to understand and effectively navigate PDF documents. For more information, see *HTML Markup Resources*).

Accessibility issues are very common in PDF files that were scanned from printed sources or exported from a non-PDF document format. Scanned documents are simply images of text. To make scanned documents accessible, you must perform Optical Character Recognition (OCR) on these documents, and proofread the resulting text for accuracy before embedding it within the PDF file. You must also add semantic structure and other metadata (headings, links, alternative content for images, and so on) to the embedded text.

When you export documents to PDF from other formats, it is important to ensure that the source document contains all the required semantic structure and metadata before exporting. Unfortunately, some applications do not include this information when exporting and require the author to add or "tag" the document manually using PDF editing software. You should carefully consider whether exporting to PDF is necessary at all.

Note: OpenOffice and LibreOffice will produce the best results when you export documents to PDF.

Best Practices for Authoring Accessible PDF Documents

- Explicitly define the language of the document so that screen readers know what language they should use to parse the document.

- Explicitly set the document title. When you export a file to PDF format, the document title usually defaults to the file name, not a human readable title.

- Verify that all images have alternative content defined or are marked as decorative only.

- Verify that the PDF file is "tagged". Make sure the semantic structure from the source document has been correctly imported to the PDF file.

- Verify that a logical reading order is defined. This is especially important for documents that have atypical page layouts or structure.

- If your document includes tables, verify that table headers for rows and columns are properly defined.

Note: When you export Microsoft Office documents as PDF, use the **Save as PDF** option. Make sure the **Document Structure Tags for Accessibility** option is selected (consult your software documentation for more details). PDFs generated from Windows versions of MS Office might be more accessible than those generated from Mac OS versions of MS Office. If you are using Mac OS, we highly recommend exporting from OpenOffice or LibreOffice.

Note: When you export from OpenOffice or LibreOffice, use the **Export as PDF** option. Make sure the **Tagged PDF** option is selected.

Evaluating PDF Files for Accessibility

EdX highly recommends using the tools available in Adobe Acrobat Pro (for example, "Accessibility Checker") to evaluate your PDF files for accessibility. Adobe Acrobat Pro also includes tools (for example, "Make Accessible") for fixing most common accessibility issues.

Accessible PDF Resources

- Microsoft provides detailed guidance on generating accessible PDFs from Microsoft Office applications, including Word, Excel, and PowerPoint.

- Adobe provides documentation on how to create and verify PDF accessibility.

- Adobe Accessibility (Adobe) is a comprehensive collection of resources on PDF authoring and repair, using Adobe's products.

- PDF Accessibility (WebAIM) provides a detailed and illustrated guide on creating accessible PDFs .

- The National Center of Disability and Access to Education has a collection of one-page "cheat sheets" on accessible document authoring.

- The Accessible Digital Office Document (ADOD) Project provides guidance on creating accessible Office documents.

Creating Accessible Word Documents

Many of the same accessibility techniques and principles that apply to authoring web content also apply to creating Word documents.

- Images must have descriptive text associated with them.

- Documents should be well structured.

- Hyperlinks should be meaningful and describe the destination.

- Tables should include properly defined column and row headers.

- Color combinations should be high contrast.

- Verify the accessibility of your document using Microsoft's Accessibility Checker.

In addition, follow these guidelines when you format Word documents.

- Keep formatting simple. Use headings, paragraphs, lists, images, and captions. Use tables for tabular data. Do not add unnecessary indents, rules, columns, blank lines, or typographic variation.

- Use standardized styles for formatting your text, such as Normal, Heading 1, and Heading 2, rather than manually formatting text using text styles and indents. Formatting text for its semantic meaning and not for its visual appearance allows users of assistive technology to consume and navigate documents effectively and efficiently.

Accessible Microsoft Word Resources

- Microsoft guide to creating accessible Word documents.

- Microsoft tool that allows you to check Word documents for accessibility issues.

Creating Accessible Excel Documents

Many of the same accessibility techniques and principles that apply to authoring data tables in HTML also apply to creating Excel spreadsheets.

- Images must have descriptive text associated with them. For more information, see Add alternative text to images and objects in Excel documents.

- Column and row headings should be programmatically identified.

- Hyperlinks in spreadsheets should be meaningful and describe the destination.
- Use a unique and informative title for each worksheet tab.
- Do not use blank cells for formatting.
- Color combinations should be high contrast.
- Verify the accessibility of your workbook using Microsoft's Accessibility Checker.

Accessible Microsoft Excel Resources

- Microsoft guide to creating accessible Excel workbooks.
- Microsoft tool that allows you to check Excel workbooks for accessibility issues.

Creating Accessible Powerpoint Documents

Many of the same accessibility techniques and principles that apply to authoring web content also apply to creating Powerpoint presentations.

- Images must have descriptive text associated with them. For more information, see Add alternative text to images and objects in Powerpoint documents.
- Column and row headings should be programmatically identified. For more information, see Specify column header information in tables in Powerpoint documents.
- Hyperlinks in presentations should be meaningful and describe the destination.
- Use a unique and informative title for each slide.
- Ensure that information is presented in a logical order
- Color combinations should be high contrast.
- Verify the accessibility of your presentation using Microsoft's Accessibility Checker.

To make your content accessible and comprehensible to learners who use screen reading software, start in Outline view and include all of your content as text. After completing the outline, add design elements and images, and use the picture formatting options in MS Powerpoint to include detailed text descriptions of images that convey useful information to learners who cannot view the images. Use the **Home > Drawing > Arrange > Selection Pane** option to view the reading order of objects on each slide. If the reading order is not logical, change the order of the objects.

Accessible Powerpoint Resources

- Microsoft guide to creating accessible PowerPoint presentations.
- WebAIM's PowerPoint Accessibility.
- Microsoft tool that allows you to check Powerpoint documents for accessibility issues.

3.3.5 Use Best Practices for Mathematical Content

Math in online courses can be challenging to deliver in a way that is accessible to people with vision impairments. Non-scalable images of mathematical content cannot be sufficiently enlarged or navigated by low-vision users and are not accessible to blind users at all.

EdX uses MathJax to render math content in a format that is clear, readable, and accessible to people who use screen readers. MathJax works together with math notation such as LaTeX and MathML to render mathematical equations

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as text instead of images. EdX recommends that you use MathJax to author your math content. MathJax renders math in a variety of formats on the client side, offering the end user the ability to consume math content in their preferred format. EdX Studio supports authoring math directly in LaTeX using the LaTeX Source Compiler to transform LaTeX into MathJax.

Accessible Mathematical Content Resources

- The MathJax website provides guidance on creating accessible pages using their display engine.

- The DO-IT project from the University of Washington provides guidance on creating accessible math content.

- The AccessSTEM website provides guidance on creating accessible science, technology, engineering and math educational content.

- The Design Science News blog shares information about making math accessible.

3.3.6 Use Best Practices for Custom Content Types

Using different content types in your courses can significantly add to the learning experience for your students. This section covers how to design several custom content types so that your course content is accessible to all learners.

- *Simulations and Interactive Modules*
- *Online Exercises and Assessments*
- *Third-Party Content*
- *Accessible Custom Content Resources*

Simulations and Interactive Modules

Simulations, including animated or gamified content, can enhance the learning experience. In particular, they benefit learners who might have difficulty acquiring knowledge from reading and processing textual content alone. However, simulations can also present some groups of learners with difficulties. To minimize barriers to learning, consider the intended learning outcome of the simulation. Is your goal to reinforce understanding that can also come from textual content or a video lecture, or is it to convey new knowledge that other course resources cannot cover? Providing alternative resources will help mitigate the impact of any barriers.

Although you can design simulations to avoid many accessibility barriers, some barriers, particularly in simulations supplied by third parties, might be difficult or impossible to address for technical or pedagogic reasons. Understanding the nature of these barriers can help you provide workarounds for learners who are affected. Keep in mind that attempted workarounds for simulations supplied by third parties might require the supplier's consent if copyrighted material is involved. If you consider third party solutions, we encourage you to evaluate them for accessibility. The easiest way to do this is to contact the vendor and ask them about the accessibility of their product.

Consider the following questions when creating simulations, keeping in mind that as the course creator, you enjoy considerable freedom in selecting course objectives and outcomes. Additionally, if the visual components of a simulation are so central to your course design, providing alternative text description and other accommodations might not be practical or feasible.

- Does the simulation require vision to understand? If so, provide text describing the concepts that the simulation conveys.

- Is a computer mouse necessary to operate the simulation? If so, provide text describing the concepts that the simulation conveys.

- Does the simulation include flashing or flickering content that could trigger seizures?

  If so, and if this content is critical to the nature of the simulation, take these steps.

  - Do not make using the simulation a requirement for a graded assessment activity.
  - Provide a warning that the simulation contains flickering or flashing content.

Online Exercises and Assessments

For each activity or assessment that you design, consider any difficulties that learners with disabilities might have in completing it, and consider using multiple assessment options. Focus on activities that can be completed and submitted by all learners.

Some students take longer to read information and input responses, such as students with visual or mobility impairments and students who need time to comprehend the information. If an exercise has a time limit, consider whether the allowed time is enough for all learners to respond. Advance planning might help to reduce the number of students requesting time extensions.

Some online exercise question types, such as the following examples, might be difficult for students who have vision or mobility impairments.

- Exercises requiring fine hand-eye coordination, such as image mapped input or drag and drop exercises, might present difficulties to students who have limited mobility. Consider alternatives that do not require fine motor skills, unless, of course, such skills are necessary for effective participation in the course. For example, instead of a drag and drop exercise for mapping atoms to compounds, provide a checkbox or multiple choice exercise.

- Highly visual stimuli, such as word clouds, might not be accessible to students who have visual impairments. Provide a text alternative that conveys the same information, such as an ordered list of words in the word cloud.

Third-Party Content

If you include links to third-party content in your course, be mindful of the accessibility of such resources. EdX recommends that you evaluate third-party content prior to sharing it with learners.

You can use the eReader tool or *Adding Files to a Course* to incorporate third-party textbooks and other publications in PDF format into your course. You can also incorporate such materials into your course in HTML format. See *Creating Accessible PDF Documents* for guidance on working with third-party supplied PDFs, and *Use Best Practices for HTML Markup* for guidance on creating accessible HTML.

Accessible Custom Content Resources

- Effective Practices for Description of Science Content within Digital Talking Books, from the National Center for Accessible Media, provides best practices for describing graphs, charts, diagrams, and illustrations.

- AccessSTEM provides guidance on creating accessible science, technology, engineering and math educational content.

- The National Center on Educational Outcomes (NCEO) provides Principles and Characteristics of Inclusive Assessment and Accountability Systems.

3.3.7 Create Accessible Media

Media-based course materials help to convey concepts and can bring course information to life. We require all videos in edX courses to include text captions in SubRip (SRT) format. The edX media player displays caption files in an interactive sidebar that benefits a variety of learners, including learners who are hard of hearing or whose native

language differs from the primary language of the media. This built-in universal design mechanism enhances your course's accessibility. When you create your course, you need to factor in time and resources for creating text captions.

Audio Captions

Audio captions are essential for presenting the readable equivalent of audio content to learners who cannot hear. They can also be helpful for learners whose native languages are languages other than the primary language of the media. Synchronized text captions allow learners who cannot hear to follow along with the video. The edX media player displays text captions as links in an interactive area adjacent to the video, which allows all learners to navigate to a specific section of the video by selecting some location within the caption text.

Text caption files start with the text version of a video's spoken content and any non-spoken audio that is important to understanding the context of the video, such as [BUZZER], [LAUGHTER], or [THUNDER]. If you created your video using a script, you have a great start on creating the text caption file. Simply review the recorded video and update the script as needed. Text captions can be uploaded to Youtube along with the video to create a timed text file in SubRip (SRT) format. Otherwise, you will need to transcribe the video yourself or engage someone to do it. There are many companies that will create timed text captions (captions that synchronize the text with the video using time codes) for a fee. SRT files should be associated with video components in Studio. See *Working with Video Components* for details on how to associate text captions with videos.

Descriptions in Video

When you create video segments, consider how you will convey information to learners who cannot see what is happening in a video. Actions that are only visible on screen without any audible equivalent are not accessible to learners who have visual impairments.

For many topics, you can fully cover concepts in the spoken presentation. If it is practical to do so, you should audibly describe visual events as they happen in the video. For example, if you are illustrating dropping a coin and a feather together from a height, you should consider narrating your actions as you perform them. Ask yourself if your video would make sense if the learner were only listening to the audio content, for example while they were driving a car.

Downloadable Transcripts

For both audio and video transcripts, consider including a text file that students can download and review using tools such as word processing, screen reader, or literacy software. All learners can use transcripts of media-based learning materials for study and review.

Accessible Media Resources

Accessible Digital Media Guidelines provides detailed advice on creating online video and audio with accessibility in mind.

3.3.8 Use Best Practices for HTML Markup

HTML is the best format for creating accessible content. It is well supported and adaptable across browsers and devices. Also, the information in HTML markup helps assistive technologies, such as screen reader software, to provide information and functionality to people with vision impairments.

Most of the problem type templates in edX Studio conform to our recommended best practices in terms of good HTML markup. You can manually add appropriate HTML tagging even if it does not exist in the component template. Depending on the type of component you are adding to your course in edX Studio, the raw HTML data is available either automatically or by selecting the "Advanced Editor" or "HTML" views.

Keep the following guidelines in mind when you create HTML content.

- Use HTML tags to describe your content's meaning rather than its appearance. For example, you should tag a title with the appropriate heading level (for example `<h2>`) rather than making the heading simply appear like a heading by using visual elements such as bold text and a larger font size. Format list items as a list rather than using images of bullets or indents. Using HTML to describe your content's meaning is valuable for learners who use screen readers, which, for example, can read through all headings of a specific level or announce the number of items in a list.

- Use HTML heading levels in sequential order to represent the structure of a document. Well-structured headings help learners and screen reader users to navigate a page and efficiently find what they are looking for.

- Use HTML list elements to group related items and make content easier to skim and read. HTML offers three kinds of lists.

    - Unordered lists, where the order of items is not important. Each item is marked with a bullet.

    - Ordered lists, where the order of items is important. Each item is listed with a number.

    - Definition lists, where each item is represented using term and description pairs (like a dictionary).

- Use table elements to format information that works best in a grid format, and include descriptive row and column headings. Tag row and column headers with the `<th>` element so screen readers can effectively describe the content in the table.

HTML Markup Resources

- Creating Semantic Structure provides guidance on reflecting the semantic structure of a web page in the underlying markup (WebAIM).

- Creating Accessible Tables provides specific guidance on creating data tables with the appropriate semantic structure so that screen readers can correctly present the information (WebAIM).

3.3.9 Apply Universal Design for Learning

Universal Design for Learning focuses on delivering courses in a format so that as many of your learners as possible can successfully interact with the learning resources and activities you provide them, without compromising on pedagogic rigor and quality.

The principles of Universal Design for Learning can be summarized by the following points.

1. Present information and content in various ways.

2. Provide more than one way for students to express what they know.

3. Stimulate interest and motivation for learning.

Course teams can apply these principles in course design by following several guidelines.

- Design resources and activities that can be accessed by learners in a variety of ways. For example, if there is a text component, provide the ability to enlarge the font size or change the text color. For images and diagrams, always provide an equivalent text description. For video, include text captions.

- Provide multiple ways for learners to engage with information and demonstrate their knowledge. This is particularly important to keep in mind as you design activities and assessments.

- Identify activities that require specific sensory or physical capability and for which it might be difficult or impossible to accommodate the accessibility needs of learners. For example, an activity that requires learners to identify objects by color might cause difficulties for learners with visual impairments. In these cases, consider whether there is a pedagogical justification for the activity being designed in that way. If there is a justification,

communicate these requirements to prospective learners in the course description and establish a plan for responding to learners who encounter barriers. If there is no justification for the requirements, edX recommends that you redesign the learning activities to be more flexible and broadly accessible.

Universal Design for Learning Resources

- Delivering Accessible Digital Learning (JISC Techdis) provides a useful overview of an inclusive approach to course design.

- The National Center on Universal Design for Learning provides a helpful overview on Universal Design for Learning.

Setting up Your Course

Use the topics in this section to create and build your course.

For information on how to develop your course content in the Studio Outline, see *Developing Your Course*.

4.1 Creating a New Course

This topic describes how to create and set up your course with Studio.

Section Contents

- *Create a New Course*
- *Edit Your Course*
- *Use the Course Checklist*
- *Add Course Team Members*

Another way to create a course is to re-run an existing course. See *Re-running a Course*.

You can also *Export a Course* and *Import a Course* through Studio. You can do this when you need to edit the course in XML.

4.1.1 Create a New Course

1. Log in to Studio.

2. Select **New Course**.

3. Enter course information as needed and select **Create**.

Note: Enter new course information carefully. This information becomes part of the URL for your course. For courses on edx.org and edX Edge, to change the URL after the course is created, you must contact edX through the Help site (http://help.edge.edx.org). Additionally, because this information becomes part of your course URL, the total number of characters in the following four fields must be 65 or fewer.

Create a New Course

Course Name *

e.g. Introduction to Computer Science

The public display name for your course. This cannot be changed, but you can set a different display name in Advanced Settings later.

Organization *

e.g. UniversityX or OrganizationX

The name of the organization sponsoring the course. **Note: This is part of your course URL, so no spaces or special characters are allowed.** This cannot be changed, but you can set a different display name in Advanced Settings later.

Course Number *

e.g. CS101

The unique number that identifies your course within your organization. **Note: This is part of your course URL, so no spaces or special characters are allowed and it cannot be changed.**

Course Run *

e.g. 2014_T1

The term in which your course will run. **Note: This is part of your course URL, so no spaces or special characters are allowed and it cannot be changed.**

CREATE   CANCEL

- For **Course Name**, enter the title of your course. For example, the name may be "Sets, Maps, and Symmetry Groups". Use title capitalization for the course title.

- For **Organization**, enter the identifier for your organization. Do not include spaces or special characters.

- For **Course Number**, enter both a subject abbreviation and a number. For example, for public health course number 207, enter **PH207**. For math course 101x, enter **Math101x**. Do not include spaces or special characters in the course number.

    Note: If your course will be open to the world, be sure to include the "x". If it is exclusively an on-campus offering, do not include the "x".*

- For **Course Run**, enter the term in which your course will run. For example, enter 2014SOND or T2_2014. Do not include spaces or special characters.

    The value that you enter for the run does not affect the course start date that you define for the course. For more information, see *Setting Start and End Dates*.

4. Select **Save.**

You then see the empty course outline.

4.1.2 Edit Your Course

After you create a course, the course opens in Studio automatically and you can begin editing.

When you return to Studio later, the Studio **My Courses** dashboard page lists the courses that you created as well as any courses for which you have course team privileges.

To open a course, select the course name. The Studio **Course Outline** page appears.

4.1.3 Use the Course Checklist

You can use a Course Checklist within Studio to help you work through the tasks of building a course.

Categories of tasks in the Course Checklist include:

- Getting Started with Studio

- Draft a Rough Course Outline

- Explore edX's Support Tools

- Draft Your Course About Page

From the **Tools** menu, select **Checklists**.
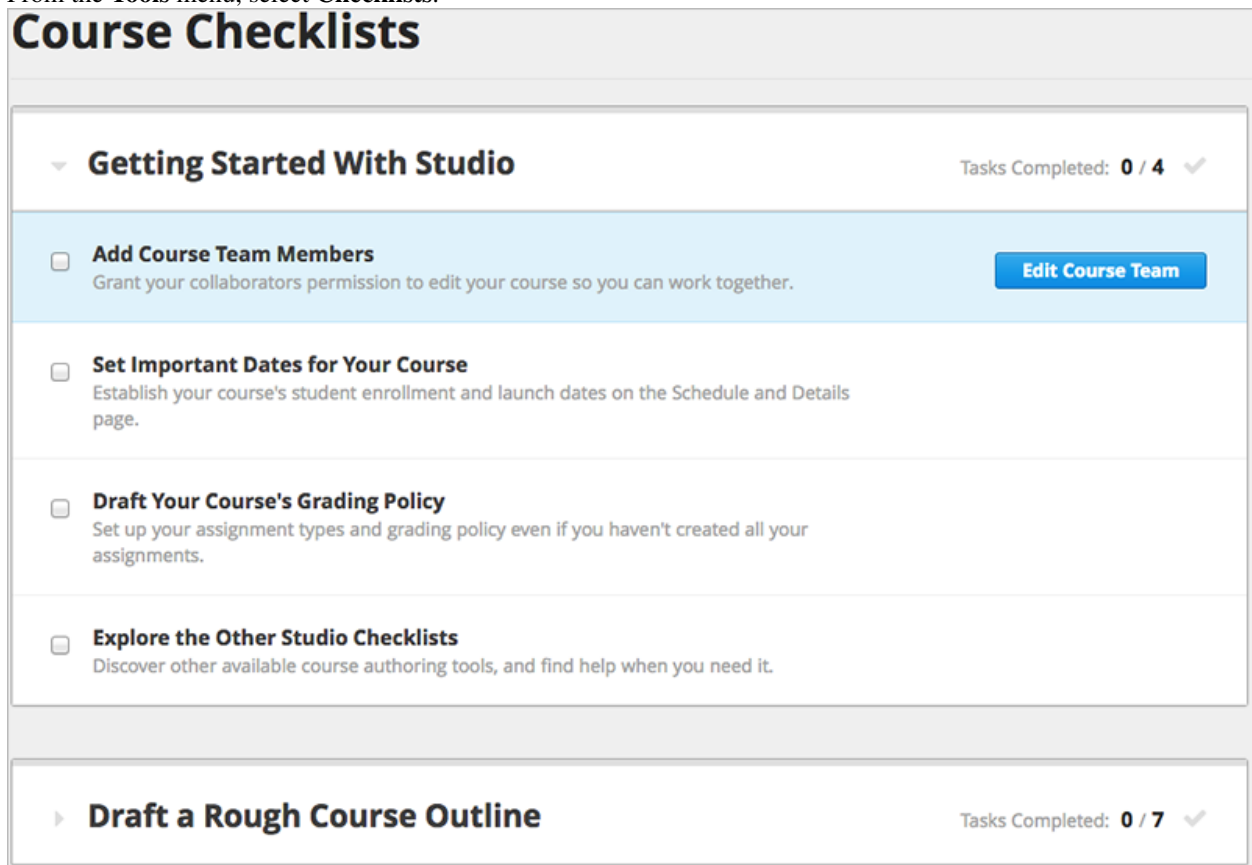
As shown in the example above, for the **Add Course Team Members** task, if you hover over a task, a button is displayed that takes you to the page to complete that task.

You can expand and collapse sections of the checklist as needed.

You can check tasks as you complete them. Studio saves your changes automatically. Other members of the course team can see your changes.

4.1.4 Add Course Team Members

Course team members are users who help you build your course. Before you can assign Staff or Admin access to a team member, you must meet these prerequisites.

- You must be an Admin.

- The team member that you want to add must register a user account and activate the account.

- You need the same, registered email address for the team member you want to add.

Other course team members can edit the course and perform all tasks except adding and removing other team members and granting Admin access.

Note: Any course team member can delete content created by other team members.

To add a course team member:

1. Ensure you have Admin access.

2. Ensure that the new team member has registered and activated an account.

3. In Studio, from the **Settings** menu, select **Course Team**.

4. Select **Add a New Team Member**.

5. Enter the new team member's email address, then select **ADD USER**.

The new team member can now work on the course in Studio.

- To preview the course in the LMS, the team member must enroll in the course.

- To moderate course discussions, the team member must also have one of the discussion roles. For more information, see *Assign Discussion Administration Roles*.

You can also assign privileged roles to users when you work in the LMS.

Regardless of where the role is assigned, these administrative team members can work on your course in Studio immediately, and use the LMS and Insights after enrollment. For more information about assigning roles while you run your course, see *Staffing*.

You can also designate teams of people to beta test your course and to moderate and manage its discussions by assigning other LMS roles. The beta testers and discussion administrators must be enrolled in your course, but they do not need to have Staff or Admin access. For more information, see *Beta Testing a Course* and *Assign Discussion Administration Roles*.

4.2 Course Search

Learners can search much of the content of your edX course, including the course title, description, course text, and video transcripts. Learners can search inside individual courses, or they can search all the courses that they are enrolled in at one time. When learners search all their courses at one time, they can filter search results based on course subject, type, and language.

Before learners can search your course, Studio must index your course content. Studio indexes your course content automatically every time you make a change to the content. You can also manually begin an indexing operation in Studio. To do this, select **Reindex** in the upper right corner of the **Course Outline** page.

The search engine returns not only exact matches for search terms, but also matches that contain the search term. These matches must contain the entire search term. For example, a search for "grade" returns results for "grades" and "graded", but a search for "graded" would not return "grade" or "grades".

When the search engine returns results, either for an individual course or across all courses, learners can select any search result to view that result in the courseware.

For more information about the student experience, see Searching the Course.

Note: Studio does not index course exercises and problems, including homework and exam problems. Studio also does not index course discussions. However, learners can search course discussions by using the **Search all posts** field on the **Discussions** page.

4.3 Setting Start and End Dates

The start and end dates you set for your course and for course enrollment are important for prospective and current learners. As soon as enrollment starts, prospective learners can see your course in the edX course catalog, view the course About page, and enroll in the course. Current learners see your course start or end date on their dashboards.

For more information about the start and end dates for your course, as well as instructions for setting start and end dates, see the following topics.

- *View Start and End Dates as a Learner*
- *Determine Start and End Dates*
- *Set Course and Enrollment Dates and Times*

4.3.1 View Start and End Dates as a Learner

Your course start date is visible to both prospective and current learners if the course has not started or is in progress. The course end date is visible to enrolled learners after the course ends.

Learners who have not yet enrolled in your course see the course start date on the About page (sometimes also called the course summary page).

Learners who enroll in your course see the start or end date for your course on their dashboards, depending on whether the course has ended. If the course has not started or is in progress, learners see the start date. If the course has ended, learners see the course end date.

4.3.2 Determine Start and End Dates

EdX recommends that you consider your course and enrollment start and end dates carefully. After you determine the dates for your course, you set these dates and times on the **Schedule & Details** page in Studio. EdX recommends that you verify all important dates in Studio one week before you plan to start the course.

Note: For courses on edX.org, you must communicate the course start and end dates and times to your edX program manager to ensure the information is accurate on the course About page.

Course Start Date and Time

The course start date and time specify when learners can access published course content. By default, the course start date and time are set to **01/01/2030** at **00:00 UTC** to ensure that your course does not start before you intend it to. You must change this setting to the correct date and time for your course.

EdX recommends that you set the start time of your course early in the day, generally 00:00 UTC or earlier. Learners often expect the course to be available on the start date in their own time zones and try to access course content during the day. If you do not specify a start time for your course, learners see the default start time, 00:00 Universal Coordinated Time (UTC).

Learners can see some parts of the course before the course start date. For example, they can see your **Course Info** page and course-wide discussion topics as soon as they enroll in your course. For more information, see *Create Course-Wide Discussion Topics*.

Note: You can set a different advertised start date for your course. You might want to do this if there is uncertainty about the exact start date. For example, you could advertise the start date as Spring 2015. For more information, see *Advertise a Different Start Date*.

Course End Date and Time

The course end date and time specify when learners can no longer earn credit toward certificates. Learners can continue to complete coursework, but cannot earn credit after the course ends. Learners who have earned certificates can view the certificates soon after the course end date.

Important: If you do not set a course end date, learners cannot access earned certificates.

Enrollment Start Date and Time

The enrollment start date and time specify when learners can start to enroll in the course. Ensure that the enrollment start date is early enough to allow learners to both enroll in and prepare for the course.

Enrollment End Date and Time

The enrollment end date and time specify when learners can no longer enroll in the course. Ensure that the enrollment end date is late enough to allow learners adequate time to enroll. The enrollment end date cannot be later than the course end date.

Important: For partner courses on edx.org, when the enrollment end date passes, the course is no longer listed in the course catalog. EdX encourages you to keep enrollment open as long as possible. For more information, contact your edX program manager.

4.3.3 Set Course and Enrollment Dates and Times

You set dates and times for the course and for course enrollment in Studio.

1. From the **Settings** menu, select **Schedule and Details**.

2. Locate the **Course Schedule** section of the **Schedule & Details** page, and replace the placeholder dates and times with your own information.

   When you make changes, a **Save Changes** button appears in the lower right corner of the page.

3. When you finish entering your dates and times, select **Save Changes**.

Note: The Time fields on this page, and the times that learners see, use Universal Coordinated Time (UTC).
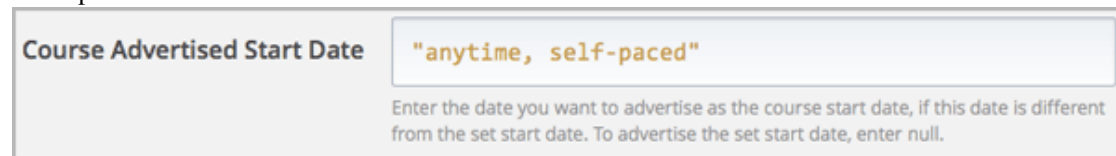

EdX recommends that you verify that all important dates are correct one week before you plan to start the course.

Advertise a Different Start Date

You can advertise a start date for your course that is different from the course start date you set in the **Schedule and Details** page. You might want to do this if there is uncertainty about the exact start date. For example, you could advertise the start date as **Spring, 2015**.

To set an advertised start date in Studio, follow these steps.

1. From the **Settings** menu, select **Advanced Settings**.

2. Find the **Course Advertised Start Date** policy key. The default value is **null**.

3. Enter the value you want to display as the advertised start date. You can use any string, enclosed in double quotation marks. If you format the string as a date (for example, as 02/01/2015), the value is parsed and presented to learners as as a date.

Course Advertised Start Date	"anytime, self-paced"
	Enter the date you want to advertise as the course start date, if this date is different from the set start date. To advertise the set start date, enter null.

4. Select **Save Changes** at the bottom of the page.

Learners now see the value of the **Course Advertised Start Date** policy key as the course start date on their dashboards.

If you do not change the default course start date (01/01/2030), and the **Course Advertised Start Date** policy value is `null`, then the dashboard does not list a start date for the course. Learners just see that the course has not yet started.

4.4 Setting Details About Your Course

This topic describes how to set details about your course in Studio. The details you set affect the information learners see on their dashboards. For more information, see *Exploring Your Dashboard, Settings, and Profile*.

> **Section Contents**
>
> - *The Course About Page*
> - *The Learner Dashboard*
> - *Describe Your Course*
> - *Add a Course Image*
> - *Add a Course Video*
> - *Set Course Effort Expectations*
> - *A Template For Your Course Overview*

For information about setting important dates, see *Setting Start and End Dates*.

For information about setting the course license, see *Licensing a Course*.

4.4.1 The Course About Page

The following example shows the course About page. Learners can see the About page before they enroll in the course, and may decide to enroll based on the content of the page.

You configure the contents of this page in Studio, as described in this topic.

Note: Given the diversity of MOOC learners, be careful to clearly communicate the target audience, level, and prerequisites for your course. Aim for concrete, unambiguous words (for example, `understand eigenvalue decomposition` rather than `intermediate linear algebra`).

4.4.2 The Learner Dashboard

If a learner enrolls in your course, the course is then listed on the **Current Courses** dashboard, with the course image. From the dashboard, a learner can open a course that has started. If the course has not started, the learner can see the start date, as explained in *Setting Start and End Dates*.
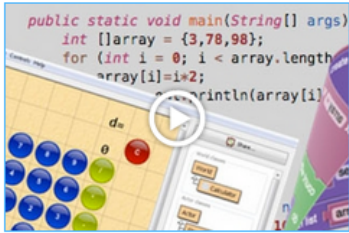
4.4.3 Describe Your Course

Learners see the description of your course on the course About page.

For example, the course description is circled in the following course About page.

Note: For courses on edX.org, you must communicate the course description to your edX Program Manager, to ensure the content is accurate on the course About page.

1. From the **Settings** menu, select **Schedule & Details**.

2. Scroll down to the **Introducing Your Course** section, then locate the **Course Overview** field.

3. Overwrite the content as needed for your course, following the directions in the boilerplate text. Do not edit

HTML tags. For a template that includes placeholders, see *A Template For Your Course Overview*.

4. Select **your course summary page** in the text beneath the field to test how the description will appear to learners.

5. When you make changes, a **Save Changes** button appears at the bottom right of the page. Select **Save Changes** when you have completed the course description.

4.4.4 Add a Course Image

The course image that you add in Studio appears on the dashboard. It should be a minimum of 378 pixels in width by 225 pixels in height, and in .jpg or .png format. Make sure the image that you upload maintains the aspect ratio of those dimensions so that the image appears correctly on the dashboard.

In the following example, the course image that was added in Studio is circled in the dashboard.

1. From the **Settings** menu, select **Schedule & Details**.

2. Scroll down to the **Course Image** section.

3. To select an image from your computer, click **Upload Course Image**, then follow the prompts to find and upload your image.

4. When you make changes, a **Save Changes** button appears at the bottom right of the page. Select **Save Changes** when you have added the course image.

5. View your dashboard to test how the image will appear to learners.
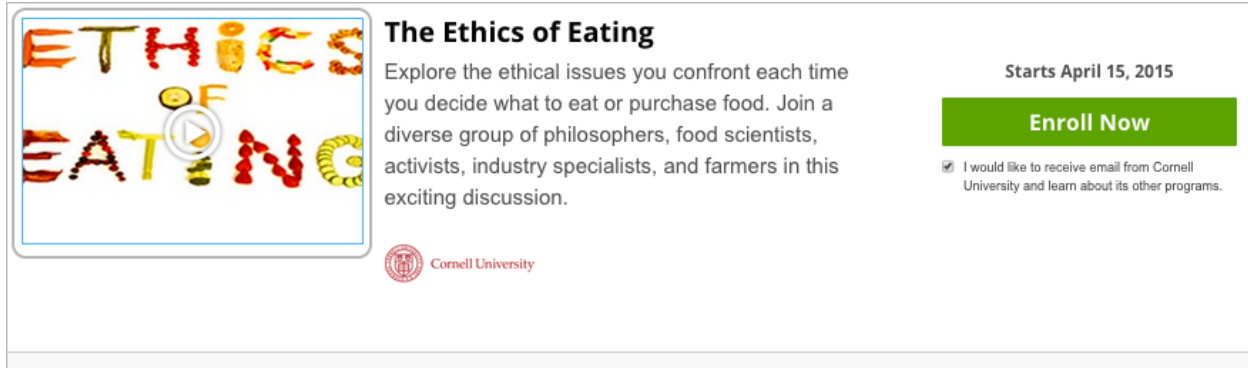
Note: On edX.org, the course image you add in Studio is used on the learner dashboard, but does not automatically appear on the course About page. Work directly with your edX program manager to set up the About page assets and course image for the course summary page.

4.4.5 Add a Course Video

The course video appears on the course About page.

In the following example, the course video is circled in the course About page:

The course video should excite and entice potential learners to enroll, and reveal some of the personality that the course team brings to the course.

The video should answer these key questions:

- Who is teaching the course?
- What university or college is the course affiliated with?
- What topics and concepts are covered in your course?
- Why should a learner enroll in your course?

The video should deliver your message as concisely as possible and have a run time of less than 2 minutes.

Ensure your course introduction video follows the same *Recommended Compression Specifications* and *Supported Video Formats* guidelines as course content videos.

1. Upload the course video to YouTube. Make note of the code that appears between **watch?v =** and **&feature** in the URL. This code appears in the green box below.
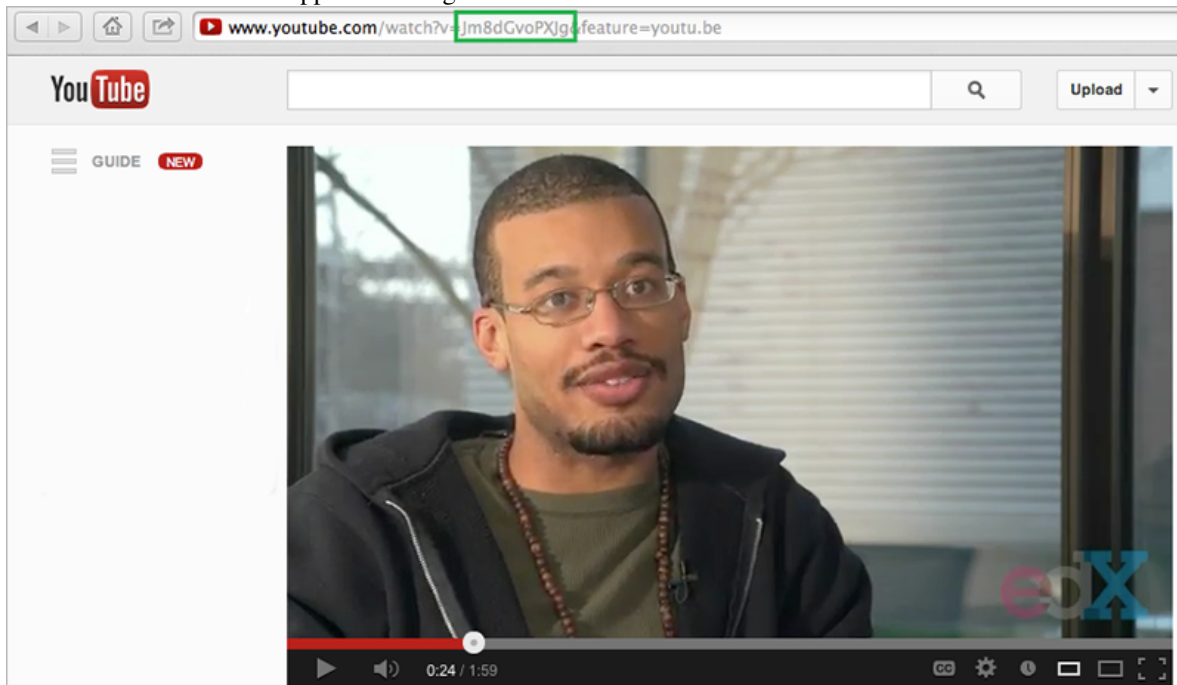
2. From the **Settings** menu, select **Schedule & Details**.
3. Scroll down to the **Course Introduction Video** section.

---

4. In the field below the video box, enter the YouTube video ID (the code you copied in step 1). When you add the code, the video automatically loads in the video box.

5. When you make changes, a **Save Changes** button appears at the bottom right of the page. Select **Save Changes** when you have added the course video.

6. View your course About page to test how the video will appear to learners.

Note: On edX.org, you work directly with your Program Manager to set up the course video in the summary page.

4.4.6 Set Course Effort Expectations

The estimated effort the course requires appears in the course About page.

You set the hours and minutes a week estimate in Studio.

1. From the **Settings** menu, select **Schedule & Details**.

2. Scroll down to the **Requirements** section.

3. In the **Hours of Effort per Week** field, enter the number of hours you expect learners to work on this course each week.

4. When you make changes, a **Save Changes** button appears at the bottom right of the page. Select **Save Changes** when you have added the estimated effort.

5. View your course About page to test how the requirements will appear to learners.

4.4.7 A Template For Your Course Overview

Replace the placeholders in the following template with your information.

```html
<section class="about">
  <h2>About This Course</h2>
  <p>Include your long course description here. The long course description
  should contain 150-400 words.</p>
  <p>This is paragraph 2 of the long course description. Add more paragraphs
  as needed. Make sure to enclose them in paragraph tags.</p>
</section>
<section class="prerequisites">
  <h2>Requirements</h2>
  <p>Add information about the skills and knowledge students need to take
  this course.</p>
</section>
<section class="course-staff">
  <h2>Course Team</h2>
  <article class="teacher">
    <div class="teacher-image">
      <img src="/static/images/placeholder-faculty.png" align="left"
      style="margin:0 20 px 0" alt="Course Team Image #1">
    </div>
    <h3>Team Member #1</h3>
    <p>Biography of course team member #1</p>
  </article>
  <article class="teacher">
    <div class="teacher-image">
      <img src="/static/images/placeholder-faculty.png" align="left"
      style="margin:0 20 px 0" alt="Course Team Image #2">
```

```
    </div>
    <h3>Team Member #2</h3>
    <p>Biography of course team member #2</p>
  </article>
</section>
<section class="faq">
  <section class="responses">
    <h2>Frequently Asked Questions</h2>
    <article class="response">
      <h3>Do I need to buy a textbook?</h3>
      <p>No, a free online version of Chemistry: Principles, Patterns, and
      Applications, First Edition by Bruce Averill and Patricia Eldredge
      will be available, though you can purchase a printed version (
      published by FlatWorld Knowledge) if you'd like.</p>
    </article>
    <article class="response">
      <h3>Question #2</h3>
      <p>Your answer would be displayed here.</p>
    </article>
  </section>
</section>
```

4.5 Set Course Prerequisites

You might want to make sure that your students have a specific set of skills and knowledge before they take your course.

- *Specify Prerequisite Courses*
- *Require an Entrance Exam*

4.5.1 Specify Prerequisite Courses

You can require that your students pass a particular edX course before they enroll in your course. Students see information about course prerequisites on the course About page.

If students have not completed the prerequisite course, they can enroll in your course and then see your course on the Student Dashboard. However, unlike with other courses, the Student Dashboard does not provide a link to the courseware. The Student Dashboard includes a link to the About page for the prerequisite course. Students can enroll in the prerequisite course from the About page.

To define one course as the prerequisite for another, you must be the course creator in both the current course and in the prerequisite course.

To specify a prerequisite course, follow these steps.

1. In Studio, open your course.

2. On the **Settings** menu, select **Schedule & Details**.

3. On the **Schedule & Details** page, scroll to the **Requirements** section.

4. Under **Prerequisite Course**, select a course from the list.

5. At the bottom of the page, select **Save Changes**.
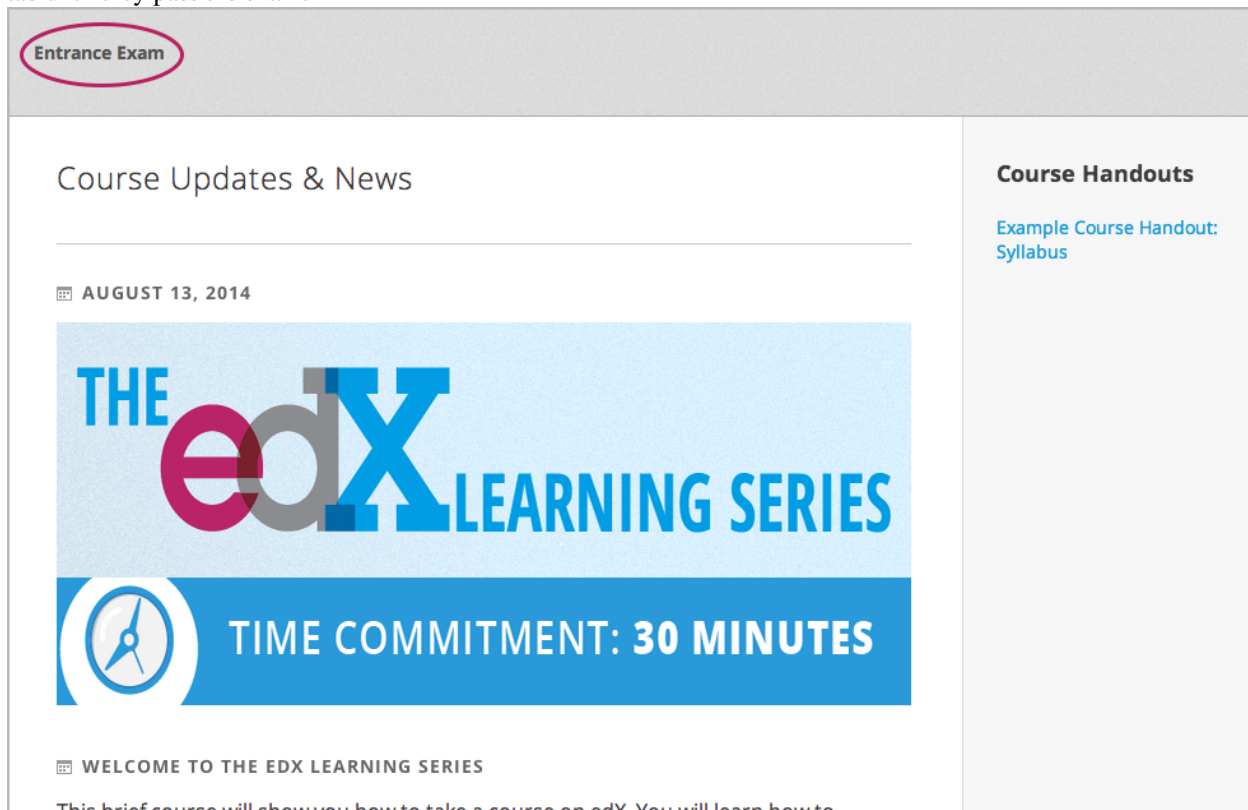
Note: Currently, you can specify only one prerequisite course.

4.5.2 Require an Entrance Exam

You can require your students to pass an entrance exam before they access your course materials. If you include an entrance exam, students who enroll in your course see only the **Course Updates & News** page and an **Entrance Exam** tab until they pass the exam.

After students pass the exam, they can access all released materials in your course.

To require an entrance exam, follow these steps.

1. In Studio, open your course.

2. On the **Settings** menu, select **Schedule & Details**.

3. On the **Schedule & Details** page, scroll to the **Requirements** section.

4. Select the **Require students to pass an exam before accessing course materials** check box.

5. At the bottom of the page, select **Save Changes**.

After you save your changes, Studio automatically creates an **Entrance Exam** section in your course outline. To add content to your entrance exam, go to the course outline.

Best Practices for Entrance Exams

We strongly recommend that you follow several guidelines to help you and your students have a positive experience with entrance exams.

- Make sure that your beta testers include the entrance exam when they test your other course content.

- Make sure that you mention the entrance exam in the course description on your course About page. Otherwise, students will not know about the entrance exam before they enroll in your course and try to access course content.

- Add an anouncement at the top of the **Course Updates & News** page that contains information and instructions for students who need to take the exam. When students first try to access content in a course that has an entrance exam, they see the **Course Updates & News** page. We suggest that you include the following information.

  - To begin the course entrance exam, students click the **Entrance Exam** tab on the left side of the screen.

  - After students complete the entrance exam, they have to click the **Entrance Exam** tab again or refresh the page in their browser. When the page refreshes, students can see all currently available course content.

Create an Entrance Exam from the Course Outline

You create your course entrance exam from the course outline in Studio. Creating entrance exam content is just like creating other course content. For more information, see *Creating Course Content*.

Adjust Scores in the Entrance Exam

If you find an error in the exam after students have taken it, and corrections to the exam are unavoidable, you have several options to rescore the exam for individual students. These options are available on the Instructor Dashboard.

On the Instructor Dashboard, click **Student Admin**, and then scroll to the **Entrance Exam Grade Adjustment** section. The following options are available.

- **Reset Student Attempts**: Reset the value for one particular student's attempts back to zero so that the student can begin work over again. For more information, see *Reset Student Attempts for a Problem*.

- **Rescore Student Submission**: Rescore the responses that a student has submitted. For more information, see *Rescore Student Submissions for a Problem*.

- **Delete Student State for Problem**: Delete a student's entire history for the exam from the database. For more information, see *Delete Student State for a Problem*.

Another option on the Instructor Dashboard is **Show Background Task History for Student**. If you reset student attempts, rescore student submissions, or delete student state, the operation runs in the background. If you want to see a record of all the operations that have run for the entrance exam, select **Show Background Task History for Student**.

4.6 Licensing a Course

You can specify licensing options for your course content as well as for each video in your course.

By specifying the license, you communicate to learners whether and how they can reuse your course content.

4.6.1 License Options

For your course content and for each video in your course, you can select one of the following license options.

- All Rights Reserved
- Creative Commons

All Rights Reserved License

The All Rights Reserved license indicates to learners that you own the copyright for course content or videos. Learners cannot reuse or republish course content or videos that have All Rights Reserved licenses.

Creative Commons License

The Creative Commons license indicates to learners that they can share or reuse course content or videos, depending on the license options that you select.

When you specify a Creative Commons license for your course or a video, you specify one or more options.

License Option	Description
Attribution	This option allows others to copy, distribute, display, and perform your copyrighted work but only if they give credit to you in the way that you request. This option is enabled for all Creative Commons licenses on edX course content. You cannot clear this option.
Noncommercial	This option allows others to distribute, display, and perform your work – and derivative works based upon it – but for non-commercial purposes only.
No Derivatives	This option allows others to distribute, display, and perform only verbatim copies of your work, not derivative works based upon it. You cannot use this option with the **Share Alike** option.
Share Alike	This option allows others to distribute derivative works only under a license identical to the license that governs your work. You cannot use this option with the **No Derivatives** option.

For more information, see the Creative Commons website.

4.6.2 Set Course Content Licensing

When you create a new course, the license is set to **All Rights Reserved**. You can change the license for your course in the **Schedule & Details** page in Studio.

The license options that you select apply to all course content, including videos, unless you explicitly specify different licensing options for your videos. Learners see the license at the bottom of all pages in the courseware.

1. From the **Settings** menu, select **Schedule & Details**.

2. Scroll to the bottom of the page to view the **Course Content License** section.

3. Select the license option for your course.

- To grant learners to right to share and use course content, select **Creative Commons**. The Creative Commons options are displayed.

Select the *Creative Commons license options* to apply.

- To reserve all course content rights, select **All Rights Reserved**.

4. Select **Save** at the bottom of the page to save your changes.

4.6.3 Set Video Licensing

If you intend for a specific video to have a different license than the course as a whole, you must set the license in the *Setting Advanced Options*.

For example, you might license for your course under Creative Commons, but use a video from another party that is copyrighted. In this case, you can set the license for that particular video to **All Rights Reserved**.

If a video is to have the same license as the course as a whole, you do not need to set the license for the video.

4.6.4 Learners' View of Licenses

When they view content in the **Courseware** tab, learners see the license that you set for the course at the bottom of the page.
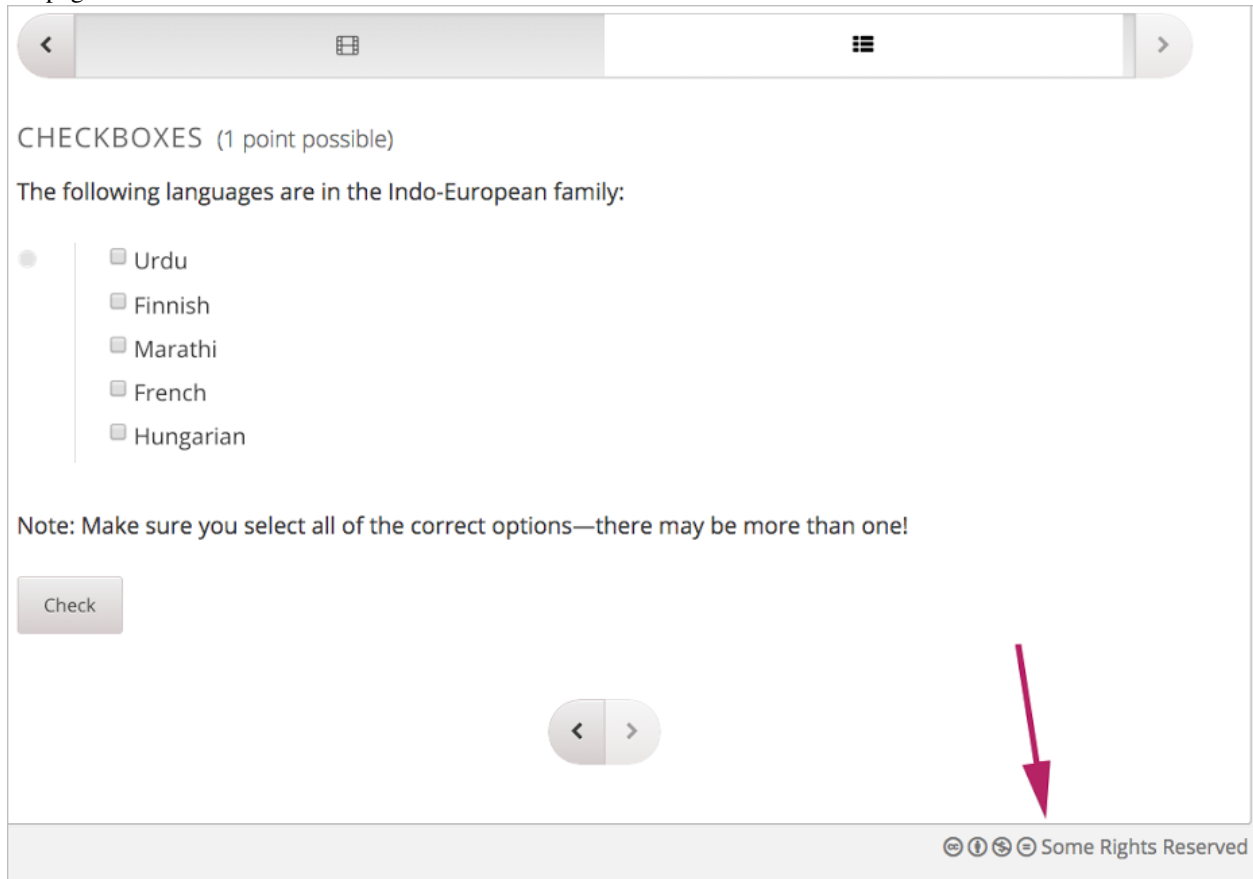
If the video has a different license than the course as a whole, learners see the license at the bottom right of the video player.
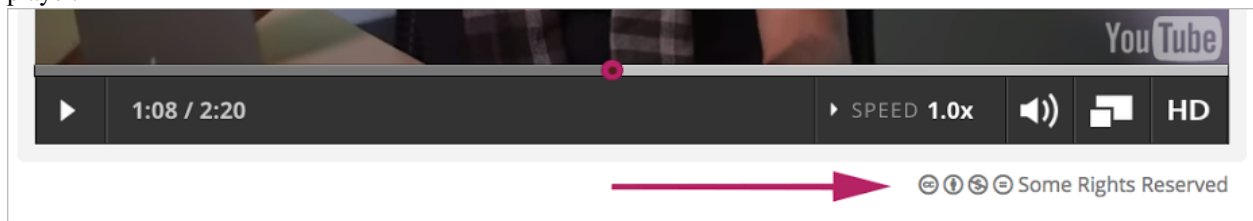
For the course and for videos, if you choose **All Rights Reserved**, learners see **All Rights Reserved**; if you choose **Creative Commons** and select any allowed combination of options, learners see **Some Rights Reserved** and can select the link to see details.

4.7 Adding Files to a Course

To use images and other files in your course, you upload the files to your course by using Studio, and then you add links to the files in the course content. You can also use uploaded files in bulk email messages sent from the Instructor Dashboard.

- *File Size*

- *Upload a File*

- *Use File URLs to Reference Uploaded Files*

- *Sort Files*

- *Filter Files*

- *Find Files*

- *Lock a File*

- *Delete a File*

4.7.1 File Size

The maximum size for an uploaded file is 50 MB.

We recommend that you use standard compression tools to reduce PDF and image file sizes before you add the files to your course. If you have to use files that are larger than 50 MB after compression, contact your edX program manager.

If you have video or audio files or large data sets to share with your students, use YouTube or another hosting service to host these files. Do not use the Files & Uploads page to add these files to your course. If you are an edX partner and you need to store large data sets, contact your edX program manager.

4.7.2 Upload a File

You upload the files in Studio on the **Files & Uploads** page.

Note: Ensure that you obtain copyright permissions for files and images you upload to your course, and that you cite sources appropriately.

To upload files:

1. Create or locate the file on your computer.

    Note: When URLs are generated for uploaded files, the file name becomes part of the URL and is visible to students when they access the file. Avoid using file names that contain information about the file contents that should not be shared, such as `Answerkey.pdf`.

    ---

2. From the **Content** menu, select **Files & Uploads**.

3. Select **Upload New File**.

4. In the **Upload New File** dialog box, select **Choose File**.

5. In the **Open** dialog box, select one or more files to upload, then select **Open**.

    Note: If you upload a file that has the same name as an existing course file, the original file is overwritten without warning.

    ---

6. To upload additional files, select **Load Another File** and repeat the previous step.

7. To close the dialog box, select the **X** in the top right corner.

The **Files & Uploads** page refreshes to show the uploaded file.

4.7.3 Use File URLs to Reference Uploaded Files

After you upload a file, you can use the URLs listed for it. On the **Files & Uploads** page, the **URL** column lists a Studio URL and web URL for each file.

Use the web URL if you want to perform either of the following actions. Add a file or image to a bulk email message... Provide a link to the file or image from outside the course.

- You use the **Studio URL** to add a file or image to a component, a course update, or course handouts. For more information, see *Add an Image to an HTML Component*. You cannot use the web URL to link to a file or image from within your course.

- Use the **Web URL** to:

  - Add a file or image to a bulk email message in the LMS. For more information, see *Send Email Messages to Course Participants*.

  - To provide a link to the file or image from outside the course.

Note: You can lock a file if you do not want anyone outside your course to view the file. When you lock a file, the web URL only allows file access to learners who are signed in to edX and enrolled in the course. For more information, see *Lock a File*.

To copy a URL from the file list, select the URL in the **URL** column and copy it.

4.7.4 Sort Files

On the **Files & Uploads** page, you can sort your files by any column that has a blue column header. For example, to sort the list by name, select the **Name** column header.

Change the sort order by selecting a sortable column header. The direction of the arrow in the column header indicates whether the order is ascending or descending. Each time you select the column header, the sort order reverses.

The current sort order is shown at the top of the file list, and the active sort column header is underlined.

4.7.5 Filter Files

You can filter the list of files by type so that only a selected type of file is visible. The list remains in the current sort order.

Type	File Types Include
Images	.gif, .ico, .jpg, .jpeg, .png, .tif, or .tiff
Documents	.pdf, .txt, Microsoft Office and Open Office documents, presentations, or spreadsheets
Other	Files not included in the other types, such as .html, .js, or .sjson

To filter the list of files by type:

1. On the **Files & Uploads** page, select the **Type** column header.

2. In the drop-down list, select the type of file that you want to view.

The list refreshes to show only the type of file you selected, and the column header changes to reflect the type of file that you have filtered by.

To reset the list and view files of all types, select **Show All** in the **Type** drop-down list.

4.7.6 Find Files

The **Files & Uploads** page lists up to 50 files. If your course has more than 50 files, additional files are listed on other pages.

The range of the files listed on the page, and the total number of files, are shown at the top of the page.

You can navigate through the pages in these ways.

- Select the **<** and **>** buttons at the top and bottom of the list to navigate to the previous and next pages.

- At the bottom of the page, you can edit the first number in the page range. Select the number to place your cursor in the field, then enter the page number you want to jump to.

4.7.7 Lock a File

By default, anyone can access a file you upload if they know the web URL, even if they are not enrolled in your course. You can prevent outside access to a file by locking the file. When you lock a file, the web URL only allows learners who are enrolled in your course and signed in to edX to access the file.

To lock a file, select the lock icon in the right column.

4.7.8 Delete a File

To delete a file, select the **x** icon in the row for file. You are prompted to confirm the deletion.

> **Warning:** After you delete a file, links to the file from course content will be broken. You must update links to files that you need to delete.

4.8 Adding Course Updates and Handouts

You add course updates and identify handouts in Studio. Learners see the course updates and handouts on the **Course Info** page in your course.

Section Contents

- *Add a Course Update*
- *Identify a Course Handout*

4.8.1 Add a Course Update

You add updates to notify learners of upcoming exams or deadlines, changes in the course schedule, or to make other announcements.

To add a course update, follow these steps.

1. From the **Content** menu, select **Updates**.

2. Select **New Update**.

3. Enter your update in the HTML editor that opens.

- You must use HTML to format your update. The *visual editor* is not provided.

- If you change the supplied date, the new date appears above the update on the **Course Info** page. However, the update is visible to all enrolled learners as soon as you post it.

1. Optionally, choose whether to send a notification about your update to the edX mobile app.

- Learners can choose to turn off notifications for individual courses or for all courses. The **Course Info** page continues to show all updates.

- All updates appear on the **Course Info** page, even if you do not send notifications.

1. Select **Post**. Your update appears on your course's **Course Info** page immediately.

4.8.2 Identify a Course Handout

You can identify previously uploaded files as handouts for your course. Learners see a link on the **Course Info** page for each course handout.

Before you identify a course handout, you *add the file* to your course and copy its Studio URL. You can open the Studio **Files & Uploads** page in another browser window to make this process easier.

To identify a course handout, follow these steps.

1. From the **Content** menu, select **Updates**.

2. In the **Course Handouts** panel, select **Edit**.

3. In the editor that opens, use HTML formatting to add a link to the previously uploaded file. An example follows.

```
<p><a href="/static/Syllabus_Fall2016.pdf" target="_blank">Syllabus</a></p>
<p><a href="/static/Glossary_v3.pdf" target="_blank">Glossary</a></p>
```

4. Select **Save**.

4.9 Adding Pages to a Course

This topic describes how to add pages, or tabs, to your course.

- *Default Pages*
- *Add a Page*
- *Hide or Show the Course Wiki Page*
- *Reorder Pages*
- *Delete a Page*
- *Code for Dynamic HTML Schedule*

4.9.1 Default Pages

By default, your course includes these pages.

- Courseware
- Course Info
- Discussion
- Wiki
- Progress

You can change the order of the **Discussion**, **Wiki**, and **Progress** pages, and you can hide the **Wiki** page.

4.9.2 Add a Page

You can add pages to your course. Each page appears for learners in the navigation bar for your course.

For example, the following navigation bar includes the default pages as well as the additional Course Schedule and Supplements & Instructor's blog pages.
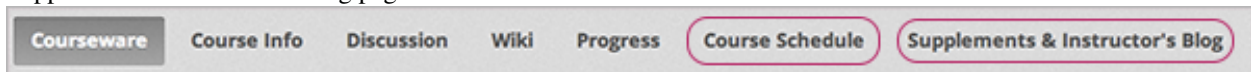
You can create other pages for the grading policy, course slides, or any other purpose. More examples of pages you can add follow.

- A dynamic HTML calendar, using the template in *Code for Dynamic HTML Schedule*.
- An instant hangout. See *Google Instant Hangout Tool* for more information.

1. In Studio, from the **Content** menu, select **Pages**. A page titled **Pages** opens. This page contains a list of the pages that appear in the navigation bar in your course.

Pages

Courseware		
Course Info		
Discussion		⣿
Wiki	👁	⣿
Progress		⣿

2. Select **Add a New Page**. A page with the title **Empty** is added to the list.

Pages

Courseware			
Course Info			
Discussion			⣿
Wiki		👁	⣿
Progress			⣿
Empty	✏ Edit	🗑	⣿

3. In the row for the new page, select **Edit**. The HTML editor opens.
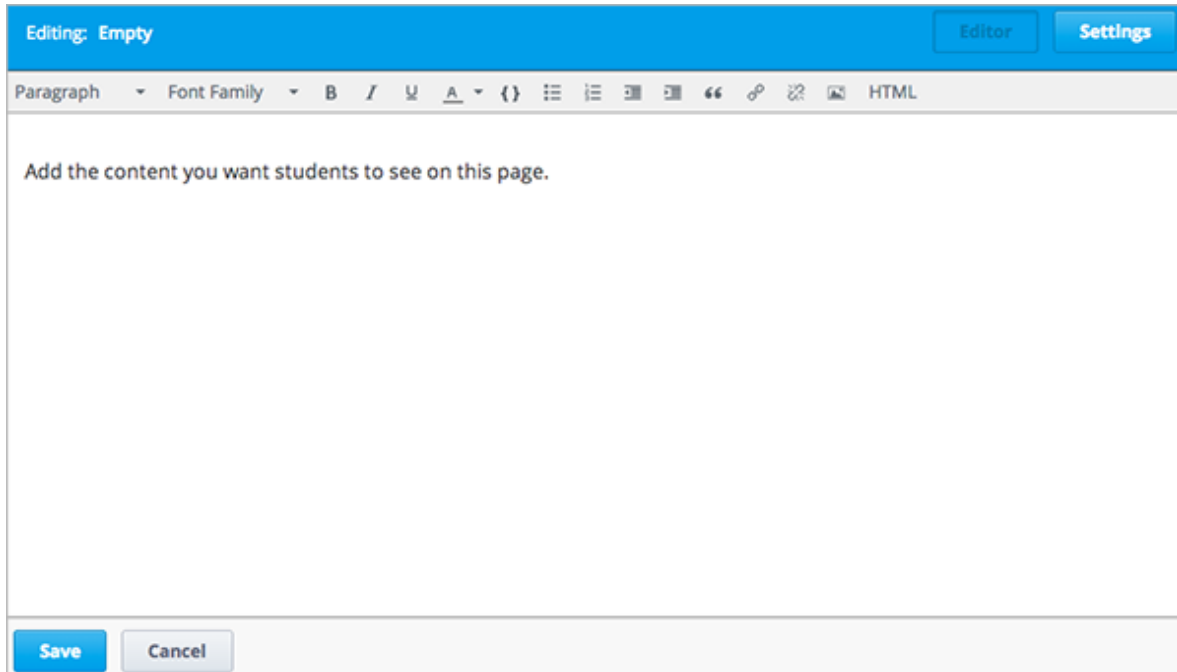
4. Enter content for your page.

   For more information about using the editor, see *Options for Editing HTML Components*.

5. Select **Settings** to edit the **Display Name**. The display name is the name of the page visible to learners in the course.

6. Select **Save**.

The new page is immediately available to learners if the course has started.

4.9.3 Hide or Show the Course Wiki Page

By default, your course includes a wiki page. Learners and the course team can use the wiki to post content as well as comment on other people's content. For details, see *Using the Course Wiki*.

If you do not want to use a wiki in your course, you can hide the page.

In the **Pages** list, the eye icon that appears next to the **Wiki** page indicates that the wiki is visible in your course.

Select the eye icon to hide the **Wiki** page. The icon changes as shown in this example.

Select it again to make the **Wiki** page visible.

Note: Content remains in the wiki when you hide the page. For example, if a student bookmarks a wiki topic, then you hide the **Wiki** page, the student can still use the bookmark to access that wiki topic. All content that was previously posted in the wiki remains available after you hide the wiki page, and any students logged in to edX can access the content if they know the URL.

4.9.4 Reorder Pages

To reorder the pages in your course you can drag a page to different location in the navigation bar and drop it there.

To move a page, hover over the element handle on the right side of the page row until the mouse pointer changes to a four-headed arrow. Then select and drag the page to the location that you want.

Note: You cannot reorder the **Courseware** or **Course Info** pages.

4.9.5 Delete a Page

To delete a page that you previously added, select the trash can icon in the row for the page. You are prompted to confirm the deletion.

Note: You cannot delete the **Courseware**, **Course Info**, **Discussion**, or **Progress** pages. You can hide the course **Wiki** page.

4.9.6 Code for Dynamic HTML Schedule

You can use the following code in a page to provide a dynamic HTML schedule in your course.

Note: Paste the following code into the page using either *the visual editor* or the *raw HTML editor*. Do not paste the code directly into the visual editor.

```html
<div class= "syllabus">

<table style="width: 100%">
        <col width="10%">
        <col width="15%">
        <col width="10%">
        <col width="30%">
        <col width="10%">
        <col width="15%">
        <col width="10%">

<!-- Headings -->
        <thead>
                <td class="day"> Wk of </td>
                <td class="topic"> Topic </td>
                <td class="reading"> Read </td>
                <td class="video"> Lecture Sequence </td>
                <td class="slides"> Slides </td>
                <td class="assignment"> HW/Q </td>
                <td class="due"> Due </td>
        </thead>

<!-- Week 1 Row 1 -->
        <tr class="first">
                <td class="day">10/22</td>
                <td class="topic">Topic 1</td>
                <td class="reading">Ch. 1</td>
                <td class="video"><a href="#">L1: Title</a></td>
                <td class="slides"><a href="#">L1</a></td>
```

```
                <td class="assignment"><a href="#">HW 1</a></td>
                <td class="due">11/04</td>
        </tr>

<!-- Week 1 Row 2 -->
        <tr>
                <td class="day"> </td>
                <td class="topic"></td>
                <td class="reading"></td>
                <td class="video"><a href="#">L2: Title</a></td>
                <td class="slides"><a href="#">L2</a></td>
                <td class="assignment">     </td>
                 <td class="due">      </td>
        </tr>

         <tr> <td class="week_separator" colspan=7> <hr/> </td> </tr>

<!-- Week 2 Row 1 -->
        <tr>
                <td class="day">10/29</td>
                <td class="topic">Topic 2</td>
                <td class="reading">Ch. 2</td>
                <td class="video"> <a href="#">L3: Title<a></td>
                 <td class="slides"><a href="#">L3</a></td>
                <td class="assignment"><a href="#">Quiz 1</a></td>
                <td class="due">11/11</td>
         </tr>

<!-- Week 2 Row 2 -->
        <tr>
                <td class="day"></td>
                <td class="topic"></td>
                <td class="reading"></td>
                <td class="video"><a href="#">L4: Title</a></td>
                <td class="slides"><a href="#">L4</a> </td>
                <td class="assignment"></td>
                <td class="due"></td>
        </tr>
        <tr> <td class="week_separator" colspan=7> <hr/> </td> </tr>

<!-- Week 3 Row 1 -->
        <tr>
                <td class="day">11/05</td>
                <td class="topic">Topic 3</td>
                <td class="reading">Ch. 3</td>
                <td class="video"><a href="#">L5: Title</a></td>
                <td class="slides"><a href="#">L5 </a></td>
                <td class="assignment"><a href="#">HW 2</a></td>
                <td class="due">11/18 </td>
        </tr>

<!-- Week 3 Row 2 -->
        <tr>
                <td class="day"> </td>
                <td class="topic"> </td>
                <td class="reading"></td>
                <td class="video"><a href="#">L6: Title</a></td>
                <td class="slides"><a href="#">L6 </a></td>
```
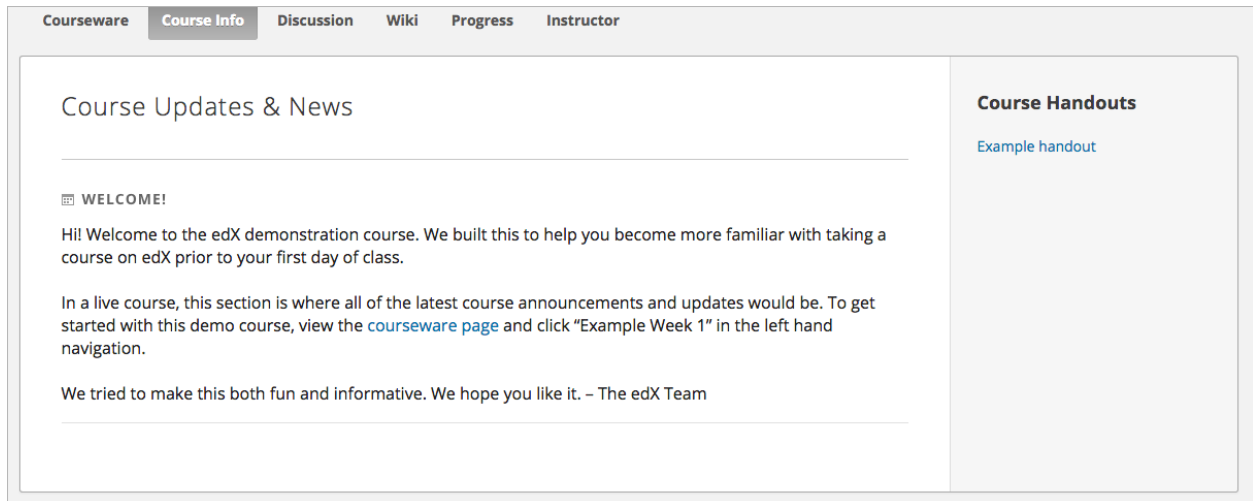
```
                    <td class="video"></td>
                    <td class="assignment"></td>
                    <td class="due"></td>
            </tr>
            <tr> <td class="week_separator" colspan=7> <hr/> </td> </tr>

    <!-- Week 4 Row 1 -->
            <tr>
                    <td class="day">11/12</td>
                    <td class="topic">Topic 4</td>
                    <td class="reading">Ch. 4</td>
                    <td class="video"><!--<a href="#">L7: Title</a>--> L7: Title</td>
                    <td class="slides"><!--<a href="#">L7</a>-->L7</td>
                    <td class="assignment"><!--<a href="#">Quiz 2</a>-->Quiz 2</td>
                    <td class="due"> 11/25 </td>
            </tr>

    <!-- Week 4 Row 2 -->
            <tr>
                    <td class="day"></td>
                    <td class="topic"></td>
                    <td class="reading"></td>
                    <td class="video"><!--<a href="#">L8: Title</a>-->L8: Title</td>
                    <td class="slides"><!--<a href="#">L8</a>-->L8</td>
                    <td class="assignment"></td>
                    <td class="due"></td>
            </tr>
            <tr> <td class="week_separator" colspan=7> <hr/> </td> </tr>

    <!-- Week 5 Row 1 -->
            <tr>
                    <td class="day">11/19</td>
                    <td class="topic">Topic 5</td>
                    <td class="reading">Ch. 5</td>
                    <td class="video"><!--<a href="#">L9: Title</a>-->L9: Title</td>
                    <td class="slides"><!--<a href="#">L9</a>-->L9</td>
<           td class="assignment"><!--<a href="#">HW 3</a>-->HW 3</td>
                    <td class="due"> 12/02 </td>
            </tr>

    <!-- Week 5 Row 2 -->
            <tr>
                    <td class="day"></td>
                    <td class="topic"></td>
                    <td class="reading"></td>
                    <td class="video"><!--<a href="#">L10: Title</a>-->L10: Title</td>
                    <td class="slides"><!--<a href="#">L10</a>-->L10 </td>
                    <td class="assignment"></td>
                    <td class="due"></td>
            </tr>
            <tr> <td class="week_separator" colspan=7> <hr/> </td> </tr>

    <!-- Week 6 Row 1 -->
            <tr>
                    <td class="day">11/26</td>
                    <td class="topic">Topic 6</td>
                    <td class="reading">Ch. 6</td>
                    <td class="video"><!--<a href="#"><L11: Title</a>-->L11: Title </td>
```

```
                <td class="slides"><!--<a href="#">L11</a>-->L11</td>
                <td class="assignment"><!--<a href="#">HW 4</a>-->HW 4</td>
                <td class="due">12/09</td>
            </tr>

    <!-- Week 6 Row 2 -->
            <tr>
                <td class="day"> </td>
                <td class="topic"> </td>
                <td class="reading"></td>
                <td class="video"><!--<a href="#">L12: Title</a>-->L12: Title</td>
                <td class="slides"><!--<a href="#">L12</a>-->L12</td>
                <td class="assignment"></td>
                <td class="due">      </td>
            </tr>
    </table>
    </div>
```

4.10 Adding Textbooks

You can add PDF textbooks to your course.

Note: Do not use image files (for example, .png files) as textbooks for your course, as they are not accessible to screen readers. For more information, review *Creating Accessible PDF Documents*.

Each textbook that you add is displayed to learners as a page, or tab, in the course navigation bar.

EdX recommends that you upload a separate PDF for each chapter of your textbook.

When learners open the textbook page in the course, they can navigate the textbook by chapter.
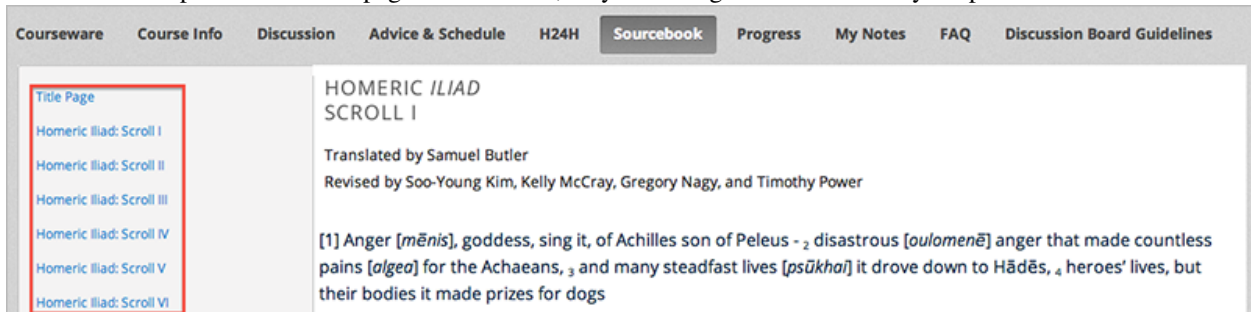
4.10.1 Add a Textbook

1. Prepare PDFs of your textbook on your computer.

2. From the **Content** menu, select **Textbooks**.

3. Select **New Textbook**. The following screen opens:

Textbook Name *

Introduction to Cookie Baking

provide the title/name of the text book as you would like your students to see it

Chapter Name * **Chapter Asset *** Upload PDF

Chapter 1 path/to/introductionToCookieBaking-CH1.pdf

provide the title/name of the chapter that will be used in navigating upload a PDF file or provide the path to a Studio asset file

+ Add a Chapter

SAVE CANCEL

4. Enter the **Textbook Name**.

5. Enter the first **Chapter Name**.

6. To upload a PDF from your computer, select **Upload PDF**. Follow the prompts to upload your file.

7. To add more chapters, select **Add a Chapter** and repeat steps 3 and 4.

8. Select **Save**.

4.11 Establishing a Grading Policy

Establishing a grading policy takes several steps. You must:

1. *Set the Grade Range*

2. *Set the Grace Period*

3. *Configure the Assignment Types*

4. *Graded Subsections*

5. *The Learner View of Grades*

Important: Any changes to the course grading policy, to graded subsections, or to graded components after a course begins will affect the student experience in the course and analysis of its data.

4.11.1 Set the Grade Range

You must set the grade range for the course. For example, your course can be pass/fail, or can have letter grades A through F.

To set the grade range, from the **Settings** menu, select **Grading**.

The control for the grade range is at the top of the Grading page.
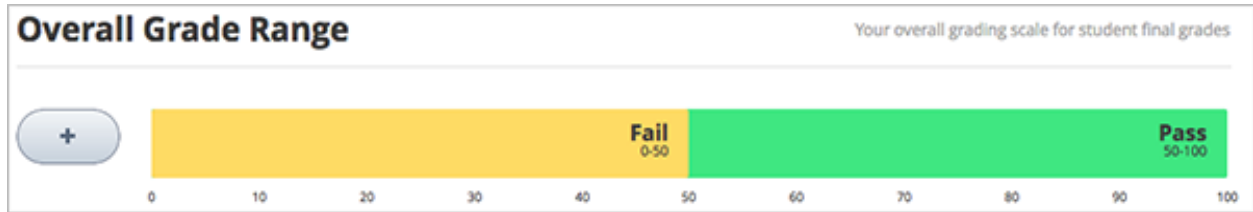
The above example shows that you have a pass/fail grade range, with a score of 50 as the cutoff. This is the default setting for a new course.

You can adjust the grade range as needed.

- To add a grade in the range, select the **+** icon.

  A new grade is added to the range between the existing grades. For example, if you add a grade in the default setting, the grade range changes to **F** (0 to 50), **B** (50 to 75), and **A** (75 to 100):

- To change the score range, move the cursor over the line dividing two grades and then select and drag the line left or right.

  You can see the range numbers of the two grades adjacent to the line change. Unselect the line when it is where you want it.

- To change the name of the grade, select the current name of the grade and start typing the name of the new grade. For example, if the original name of the grade is "Pass", you can select "Pass" and then type "Excellent" to replace the name.

  You cannot change **F** or **Fail**.

- To remove a grade, move the cursor so that it is over the grade.

  A **remove** link appears above the grade. Select the link.

  You cannot remove F or A.

After you make any changes to the grade range, you must select **Save Changes** at the bottom of the page.

Grade Ranges and Certificates

If you plan for your course to offer certificates, note that a learner will qualify for a certificate by earning any grade over the F, or Fail, threshold. This is true regardless of how many grade levels you add in the grade range.

4.11.2 Set the Grace Period

You can set a grace period that extends homework due dates for your learners.

Note: The grace period applies to the whole course; you cannot set a grace period for individual assignments.

In the Grading page, under **Grading Rules & Policies**, enter a value in the **Grace Period on Deadline** field. Enter the value in Hours:Minutes format.

4.11.3 Configure the Assignment Types

You must create assignment types for your course and determine the weight of the total grade for each assignment type.

For example, you might have the following assignment types.

- 10 homework assignments, worth a total of 50% of the grade;

- A midterm exam, worth a total of 20% of the grade;

- A final exam, worth 30% of the grade.

By default, a new course has the following four assignment types.

- Homework

- Lab

- Midterm Exam

- Final Exam

You can use these assignment types, modify or remove them, and create new assignment types.

To create a new assignment type, in the bottom of the Grading page, select **New Assignment Type**, then configure the fields described below.

Note: In a MOOC, some number of learners will experience personal emergencies, technical problems (such as power blackouts or loss of internet access), or other issues. You will not be able to grant individual extensions to such learners, but can provide some amount of flexibility for managing such issues by designing longer deadlines and allowing droppable assignments.

Assignment Type Fields

You configure the following fields for each assignment type.

- **Assignment Type Name:**

  The general category of the assignment. This name will be visible to learners.

  Note: All assignments of a particular type count the same toward the weight of that category. As a result, a homework assignment that contains 10 problems is worth the same percentage of a student's grade as a homework assignment that contains 20 problems.

- **Abbreviation:**

  This is the short name that appears next to an assignment on a learner's **Progress** tab.

- **Weight of Total Grade:**

  The assignments of this type together account for the percent value set in **Weight of Total Grade**.

  The total weight of all assignment types must equal 100.

  Note: Do not include the percent sign (%) in this field.

- **Total Number:**

  The total number of subsections in your course that contain problems of this assignment type.

- **Number of Droppable**

  The number of assignments of this type that the grader will drop. The grader will drop the lowest-scored assignments first.

4.11.4 Graded Subsections

After you configure assignment types, as you are organizing your course, you set the assignment type for subsections that contain problems that are to be graded.

Each subsection that contains problems to be graded can include only one assignment type.

Note: You can only set assignment types and due dates at the subsection level. You cannot set assignment types or due dates for entire sections or for individual units within subsections. Additionally, you can designate a subsection as one, and only one, of the assignment types you configured.

For more information, see *Developing Course Subsections*.

For instructions on designating a subsection as a graded assignment, see *Set the Assignment Type and Due Date for a Subsection*.

Within a graded subsection, you create problems of the type designated for that subsection. You cannot not mix problems of different assignment types in the same subsection.

For example, if you want to create a homework assignment and a lab for a specific topic, create two subsections. Set one subsection as the Homework assignment type and the other as the Lab assignment type. Both subsections can contain other content as well as the actual homework or lab problems.

Note: You can create problems in Studio without specifying that the subsection is an assignment type. However, such problems do not count toward a learner's grade.

For more information about creating problems, see *Working with Problem Components*.

4.11.5 The Learner View of Grades

After a grading policy is in place, learners can view both their problem scores and the percent completed and current grade in the **Progress** tab for the course.
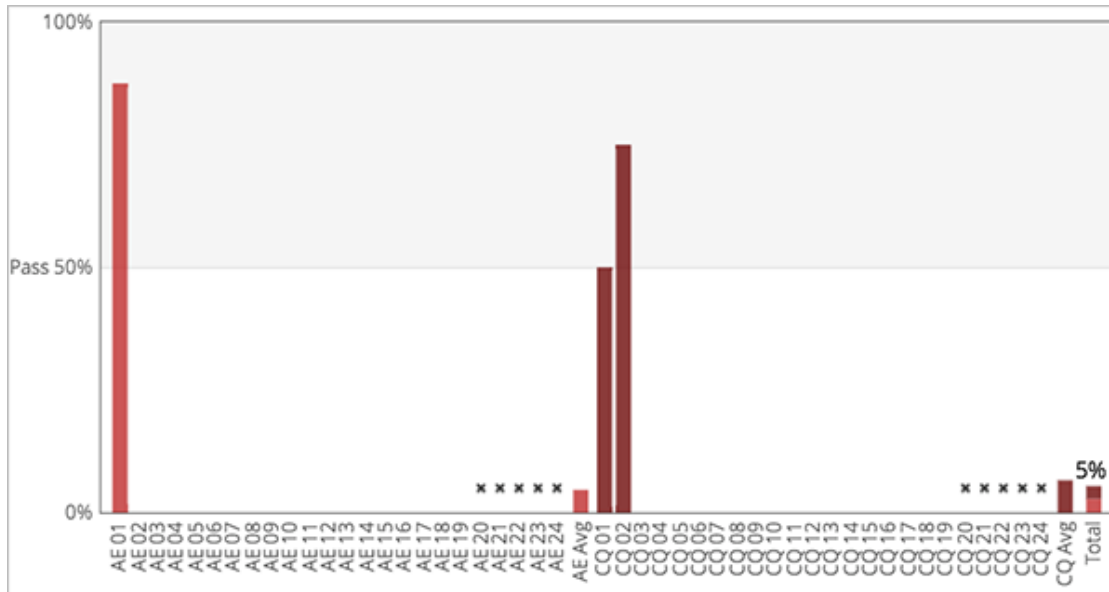
Each item in the X axis of the chart is for a graded subsection. Graded problems in units are not broken out in the chart; the score from each problem in the subsection is added to that vertical bar.

Graded subsections are grouped in the chart by assignment type rather than listed in chronological order. For example, all homework exercises are grouped together, followed by labs, then exams.

Note: The **x** for an assignment in the Progress tab indicates that the grade for that assignment is currently dropped. You configure how many assignments are dropped when you *configure assignment types*.

4.12 Setting Up Course Certificates

This section describes how to configure certificates for your course in Studio.

- *Create a Certificate Configuration*
- *Edit a Certificate Configuration*
- *Delete a Certificate Configuration*
- *Preview Certificates*
- *Activate a Certificate Configuration*
- *Deactivate a Certificate Configuration*
- *Manage Certificate Images*
- *Enable or Disable Badges for Your Course*

4.12.1 Create a Certificate Configuration

You create one certificate configuration per course to serve as the template for certificates issued for all of the enrollment tracks available for your course (such as "honor code" or "verified"). Honor code certificates use the organization logo and signatory information, but do not include signature images, which are used only for verified certificates.

To create a certificate configuration for your course, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, select **Add a new certificate**.

3. (Optional) Specify an alternative course title to use on the certificate instead of the official course title. You might want to use a different title on your course certificates if, for example, the official course name is too long to fit well on the certificate.

4. Upload your organization's logo image file. Make sure that this is the approved official logo for your organization, for consistency with certificates that are issued by other courses in your organization.

Note: Images that you upload for certificates can be a maximum of 10MB in size and must not exceed the dimensions indicated underneath the **Organization Logo** field.

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5. Add a signatory for each person associated with the course or organization whose name and title you want to appear on the certificate, up to a maximum of four signatories. You must specify at least one signatory.

6. (Optional) If you offer verified certificates in your course, upload image files showing the signature for each signatory. Signature images are used only for verified certificates; honor certificates show only the names and titles of signatories, without signatures.

7. When you have finished creating your certificate configuration, select **Create**.

   You can *preview the certificate* to see how it will appear to a learner taking the course in the selected mode.

   Your course certificate is not available for issuing to learners until you *activate the certificate configuration*.

4.12.2 Edit a Certificate Configuration

You can edit a certificate configuration at any time, including after the configuration has been activated. However, as a best practice, do not make changes to certificate configurations in a running course if it is possible that certificates have already been issued to learners, because different learners might be awarded certificates with different details for the same course.

To make changes to a certificate configuration, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, at the top right corner of the certificate configuration form, select the **Edit** icon.

3. When you have finished editing the certificate configuration, select **Save**.

   After you save your changes, you can *preview the certificate* to make sure it appears as you want it to. You then need to *activate the certificate configuration* again before certificates can be issued.

4.12.3 Delete a Certificate Configuration

You can delete a certificate configuration at any time. However, as a best practice, do not delete certificate configurations in a running course if it is possible that certificates have already been issued to learners.

To delete a certificate configuration, follow these steps.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, at the top right corner of the certificate configuration form, select the "Delete" icon.

3. In the confirmation dialog, confirm that you want to delete the certificate configuration.

Certificate Details

✎ Edit 🗑

4.12.4 Preview Certificates

After you have finished editing your certificate configuration, you can preview a certificate for verification purposes. You select from the available course modes (such as "honor code" or "verified") to see how a certificate will appear to a learner taking the course in the selected mode.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, select the course mode of the certificate you want to preview, then click **Preview Certificate**.

   You see the web view for the certificate, as a learner in the selected course mode would see it.

Choose mode honor ⬍   **Preview Certificate**   **Activate**
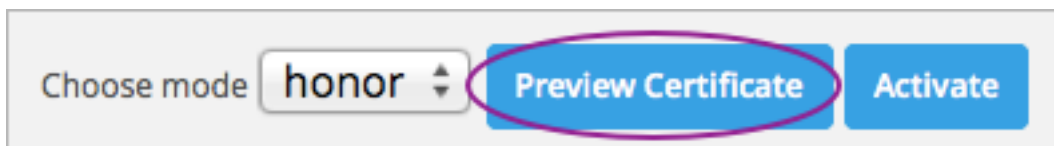
After previewing the certificate, you can *edit the certificate* further or *activate your certificate configuration*.

4.12.5 Activate a Certificate Configuration

When you have verified your certificate configuration and are ready to issue certificates, you activate the configuration.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, click **Activate**.

Choose mode honor ⬍   **Preview Certificate**   **Activate**
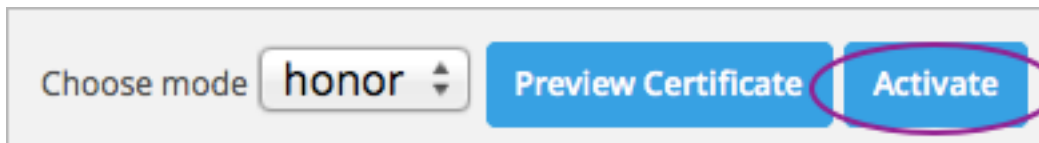
The certificate configuration becomes active. When learners in your course attain a passing grade or otherwise qualify for certificates, they receive certificates that are based on this active configuration.

You can edit active certificate configurations, but if you make and save any changes, the configuration becomes inactive. You must activate it again before certificates can be issued using the configuration.

4.12.6 Deactivate a Certificate Configuration

In some situations, after having made a certificate configuration active, you might need to deactivate an active certificate configuration. If there are no active configurations, certificates are not available for issuing or for viewing by learners.As a best practice, do not make changes to certificate configurations in a running course if it is possible that certificates have already been issued to learners.

1. In Studio, from the **Settings** menu, select **Certificates**.

2. On the Certificates page, click **Deactivate**.

The certificate configuration is no longer active. Certificates cannot be viewed by or issued to learners.

4.12.7 Manage Certificate Images

When you add image files to a certificate configuration, such as the organization logo or signature images, the uploaded files are listed in Studio on the **Files & Uploads** page.

When you delete a certificate configuration, images that you uploaded for use with that configuration are also deleted. However, if you edit a certificate configuration and replace images, the unused image files remain on the **Files & Uploads** page. You can manually remove unused images. For information, see *Delete a File*.

4.12.8 Enable or Disable Badges for Your Course

Badges provide a way for learners to share their course achievements. For courses that have badges enabled, learners receive a badge at the same time as they receive a course certificate, and have the option of sharing their badges to a badging site such as Mozilla Backpack.

The Open edX platform supports Open Badges, an open standard developed by the Mozilla Foundation. For more information about Open Badges, see the Open Badges web site.

If badging is enabled for your platform, badges are enabled by default for your course. If you are unsure whether badging is enabled for your platform, contact your platform administrator.

To stop issuing badges in your course, follow these steps.

1. In Studio, from the **Settings** menu, select **Advanced Settings**.

2. Locate the **Issue Open Badges** policy key. The default value is `True`.

3. Change the setting to `False` and save your changes.

To enable badging for your course if it has previously been disabled, change the value of the key to `True`.

4.13 Re-running a Course

Another way to create a course in Studio is to re-run an existing course. When you select the course re-run option, most, but not all, of the original course content is duplicated to the new course. The original course is not changed in any way.

- *Data Duplicated When You Re-Run a Course*

- *Use Re-Run to Create a Course*

- *Update the New Course*

4.13.1 Data Duplicated When You Re-Run a Course

Type of Content	Duplicated to New Course?
Course start date	No. Set to midnight on January 1, 2030 (UTC).
All other course dates	Yes. You must update all release dates and due dates.
Course structure (sections, subsections, units) and state (published, hidden)	Yes.
Individual problems and other components	Yes.
Files uploaded to the course, including videos and textbooks	Yes.
Pages added to the course	Yes, including all page content and the defined page order.
Course Updates	Yes.
Advanced Settings	Yes.
Grading policy	Yes.
Student enrollment data	No.
Course team privileges, including admins, discussion moderators, beta testers	No. Only the user who created the new course has access to it.
Manually created cohort groups	No.
Student answers, progress, and grading data	No.
Certificates	No.
Discussion posts, responses, comments, and other data	No.
Wiki contributions	No.

After you re-run a course, modifications to the original course and the re-run course are independent. Changes to either course are not propagated to the other course. Therefore, you should ensure that the original course content is as complete as possible before you re-run the course.

For more information, see *Use Re-Run to Create a Course* and *Update the New Course*.

4.13.2 Use Re-Run to Create a Course

Before you re-run a course, complete the following steps.

- For a course that is hosted on the edge.edx.org site, verify that you have permission to create courses in Studio.

- For a course that is hosted on the edx.org site, contact your Program Manager. Your Program Manager will create the new course using the re-run feature, and then work with you to complete the steps to *update the new course*.

- Ensure that the course content is complete. Additions and changes you make to the original course after creating the new course are not propagated to the new course.

To re-run a course, you must have course creation privileges in Studio and you must be a member of the course team for the course you want to re-run.

To re-run a course, follow these steps.

1. Log in to Studio. Your dashboard lists the courses that you have access to as a course team member.

2. Move your cursor over each row in the list of courses. The **Re-Run Course** and **View Live** options appear for each course.

3. Locate the course you want to re-run and select **Re-Run Course**. The **Create a re-run of a course** page opens with values already supplied in the **Course Name**, **Organization**, and **Course Number** fields.

4. Supply a **Course Run** to indicate when the new course will be offered.

   Together, the course number, the organization, and the course run are used to create the URL for the new course. The combination of these three values must be unique for the new course. In addition, the total number of characters used for the name, organization, number, and run must be 65 or fewer.

5. Select **Create Re-Run**. Your **My Courses** dashboard opens with a status message about the course creation process.

   Duplication of the course structure and content takes several minutes. You can work in other parts of Studio or in the LMS, or on other web sites, while the process runs. The new course appears on your **My Courses** dashboard in Studio when configuration is complete.

4.13.3 Update the New Course

When you create a course by re-running another course, you must carefully review the settings and content of the new course. To assure a quality experience for learners, be sure to test the course thoroughly before the course start date. See *Testing Your Course Content* and *Beta Testing a Course*.

At a minimum, you must make the following changes to prepare the new course for release.

- Add course team members, including discussion admins, moderators, and community TAs. See *Add Course Team Members* or *Staffing*.

- Update course-wide dates, including course and enrollment start and end dates. See *Setting Start and End Dates*.

- Change the release dates of course sections, subsections, and units. See *Release Dates*.

- Change the due dates of subsections that are part of your grading policy. See *Set the Assignment Type and Due Date for a Subsection*.

- Delete or edit posts on the **Course Updates** page in Studio. See *Add a Course Update*.

- Review the files on the **Files & Uploads** page. To update a file that contains references to course-related dates, you must complete the following steps.

  1. Locate the source file.

  2. Change course-related dates in the file.

  3. Upload the revised version of the file.

  Note: If you use the same file name when you upload a revised file, links to that file in course components and course handouts will continue to work correctly. If you rename a file and then upload it, you must also update all links to the original file name. See *Identify a Course Handout* or *Add a Link to a File*.

- Review the staff biographies and other information on the course summary page and make needed updates. See *The Course About Page*.

- Create initial posts for discussion topics and an "introduce yourself" post. See *Managing Course Discussions*.

- Add initial wiki articles.

You can use the *course checklists* to work through the course and verify that it is ready for release. You can also refer to the *Course Launching Activities* topic for tools and ideas that help you prepare the course for launch.

Note: Changes you make in the new course are not propagated to the original course.

4.14 Creating a Custom Course

This topic describes custom courses on the edX platform (CCX).

Section Contents

- *Overview*
- *Custom Courses and Roles*
- *Enable Custom Courses for an Existing Course*
- *Add a CCX Coach*
- *Create the Custom Course*
- *The CCX Coach Dashboard*

4.14.1 Overview

You can create a custom course in the edX platform (CCX) to reuse course content. By using a CCX, you can run some or all of an existing course for a group of students on a new schedule.

A CCX can contain only content from an existing course; you cannot author new content in a CCX.

4.14.2 Custom Courses and Roles

There are three roles involved in creating and running a CCX.

- **Admins** create the existing course and have privileges to create CCX coaches for their course.
- **CCX Coaches** select content from the existing course for the CCX. CCX coaches also enroll learners, set start and due dates for their scheduled content, and manage the grading policy for the CCX.
- **Learners** take the CCX and view the selected content on the specified schedule.

4.14.3 Enable Custom Courses for an Existing Course

CCX for a course is disabled by default.

You enable CCX in Studio. Ensure you have access to the course in Studio, then complete the following steps.

1. In Studio, from the **Settings** menu, select **Advanced Settings**.
2. Find the `Enable CCX` key and change the value to `true`.
3. Click `Save Changes`.

You can now add a CCX coach.

4.14.4 Add a CCX Coach

The first step to create a CCX is to create a CCX coach in an existing course. A CCX can have only one CCX coach.

You add a CCX coach through the Instructor Dashboard in the LMS. Ensure you have the Admin role in the course.

In addition, ensure that the new CCX coach has registered in the LMS and enrolled in the course.

1. In the LMS, select **Instructor**, and then select **Membership**.
2. In the **Course Team Management** section, from **Select a course team role**, select **CCX Coaches**.
3. Enter the CCX coach's username or email address and select **Add CCX Coach**.

When the CCX coach next logs into the LMS, the **CCX Coach** tab will be visible. The CCX coach dashboard is not accessible by course team members with other roles.

4.14.5 Create the Custom Course

When you have been made the CCX coach for a course, you can then access the course and create a CCX.

1. In the LMS, select the **CCX Coach** tab.
2. From the CCX coach Dashboard, enter the name for your CCX, then select **Coach a new Custom Course for edX**.
3. When the CCX is created, you are re-directed to the full CCX coach Dashboard.

Note: When entering a CCX name, consider that the name should distinguish your CCX from other CCXs based on the same course.

You can revisit your CCX by opening the original course and selecting the `CCX Coach` tab.

4.14.6 The CCX Coach Dashboard

The CCX coach Dashboard provides the tools for you to manage the CCX. The CCX coach Dashboard contains four tabs, described in the following sections.

Note: CCX coaches do not have the same level of access and control over content that team members with the Admin or Staff roles do, and do not have access to the Instructor Dashboard.

Schedule Tab

On the **Schedule** tab, you select the course content from the original course that is to be included in the CCX.

Use the drop-down lists to drill down through the course content and select an items from the content hierarchy. You then add those items in the order needed.

Select **add all units** to include all of the source course's content.

You can configure each unit to have its own start and due dates. You can select these before or after you add the unit to the CCX . After units are added, you can edit their start and due dates by hovering over or selecting that space on the CCX content hierarchy.

Select **Save changes** to save the content you configured.

Enrollment Tab

The **Enrollment** tab contains controls to invite and manage learners. Select **Student List Management** to add individual students who are already registered on the platform.

To have students added in through Batch Enrollment receive an email invitation to the CCX, select **Notify users by email**. Students are automatically enrolled in the CCX when they access the invitation.

Student Admin Tab

You use the **Student Admin** tab to view the gradebook and download student grades.

Grading Policy Tab

Use the **Grading Policy** tab to modify the grading policy for the CCX.

A CCX coach can modify the grading policy of the underlying course for their CCX.

Note: As a CCX coach, you can modify the grading policy of the original course on which the CCX was based. Only attempt this if you are confident that you understand how your changes will affect grading. Modifying the grading policy can make your CCX unusable.

The grading policy is in JSON format. Verify that it is well-formed before selecting **Save Grading Policy**.

4.15 Exporting and Importing a Course

You can *Export a Course* and *Import a Course* through Studio.

When you import and export a course, you work with *.tar.gz files*.

To duplicate an existing course for a new run, course creators can use the course re-run option. See *Re-running a Course*.

> **Caution:** Before exporting and importing a course, ensure that links in the course to other course content use the `/jump_to_id/<unit identifier>` syntax. If a link does not use the `/jump_to_id/<unit identifier>` syntax, the link will be broken if you export then import the course. For more information, see *Add a Link to a Course Unit*.

4.15.1 Export a Course

There are several reasons you might want to export your course. Examples follow.

- To save your work.
- To edit the XML in your course directly.
- To create a backup copy of your course, which you can import if you want to revert the course back to a previous state.
- To share with the team members of another course.
- To create a copy of your course that you can later import into another course instance and customize.

When you export your course, Studio creates a **.tar.gz** file that includes the following course data.

- Course content (all Sections, Subsections, and Units)
- Course structure
- Individual problems
- Pages
- Course assets
- Course settings

The following data is not exported with your course.

- User data
- Course team data
- Discussion data
- Certificates

To export your course, follow these steps.

1. From the **Tools** menu, select **Export**.
2. Select **Export Course Content**.

When the export completes you can then access the .tar.gz file on your computer.

4.15.2 Import a Course

> **Warning:** Content of the imported course replaces all the content of this course. **You cannot undo a course import**. We recommend that you first export the current course, so you have a backup copy of it.

There are several reasons you may want to import a course. For example:

- To load a course you developed outside of Studio.

- To run a new version of a course that was not created in Studio.

The course that you import must be in a .tar.gz file (that is, a .tar file compressed with GNU Zip). This .tar.gz file must contain a course.xml file in a course data directory. The tar.gz file must have the same name as the course data directory. It may also contain other files.

If your course uses legacy layout structures, you may not be able to edit the course in Studio. To make sure that your course is completely editable, ensure that all components are embedded in a unit.

The import process has five stages. During the first two stages, you must stay on the Course Import page. You can leave this page after the Unpacking stage has completed. EdX recommends, however, that you don't make important changes to your course until the import operation has completed.

To import a course, follow these steps.

1. From the **Tools** menu, select **Import**.

2. Select **Choose a File to Import**.

3. Locate the file that you want, and then Select **Open**.

4. Select **Replace my course with the one above**.

> **Note:** When you import a course, important dates, such as the course start date and time, are overwritten. After the import is complete, you should check dates to ensure they are set as intended. For more information, see *Setting Start and End Dates*.

4.15.3 Work with the .tar.gz File

Courses are exported and imported in .tar.gz files containing OLX, an edX format for open course exchange. For more information about OLX, see the edX OLX Documentation.

To extract and compress .tar.gz files, you will need a third-party program.

If you are using Microsoft Windows, see the following resources.

- How to Unpack a tar File in Windows

- How to Extract a Gz File

- The gzip Home Page

- The Windows section of the How to Open .tar.gz Files page

If you are using a Macintosh computer, see the following resources:

- The Mac OS X section of the How to Open .tar.gz Files page.

Developing Your Course

Use the chapters in this section to understand how to develop your course content in the Studio Outline page.

For information on building specific course component types, see *Creating Course Content*.

For information on creating exercises and tools, see *Creating Exercises and Tools*.

For information on creating content libraries from which you can randomly draw content for randomized assigments, see *Working with Content Libraries*.

5.1 Getting Started with Course Content Development

When you are done *setting up your course*, you are ready to build your course content.

This chapter provides an outline of the steps involved in developing your course content, with links to more details. See:

- *Understanding Course Building Blocks*
- *Creating New Course Content*
- *Making Course Content Visible to Students*
- *Revising Content*

5.1.1 Understanding Course Building Blocks

Before you begin, you should understand the building blocks of an edX course.

- *The course outline* is the container for all of your course content. The outline contains one or more sections.
- *Course sections* are at the top level of your course and typically represent a time period. A section contains one or more subsections.
- *Course subsections* are parts of a section, and usually represent a topic or other organizing principle. A subsection contains one or more units.
- *Course units* are lessons in a subsection that students view as single pages. A unit contains one or more components.
- *Course components* are objects within units that contain your actual course content.

5.1.2 Creating New Course Content

Once you understand the way edX courses are structured, you can start organizing your content and entering it into Studio.

You create *sections*, *subsections*, and *units* in the *course outline*.

For graded subsections, you also *set the assignment type and due date*.

You *create components* in the unit page.

In addition, you *control content visibility* by setting release dates on the outline and publishing units.

The following diagram summarizes the content creation workflow:
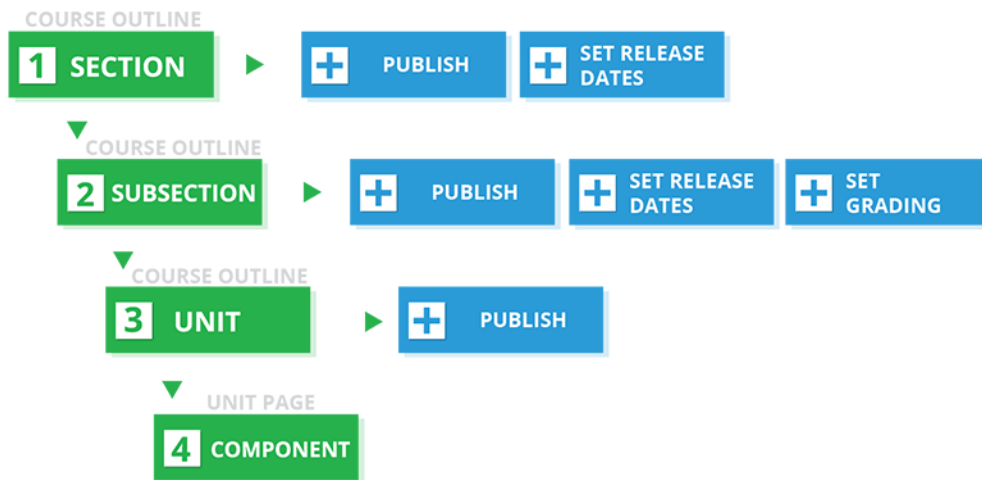
It is recommended that you *test course content* throughout the creation process.

5.1.3 Making Course Content Visible to Students

When you create your content, you'll also specify if and when students will be able to see it. Content visibility depends on several factors:

- The *course start date*
- The release dates of the *section* and *subsection*
- The *publishing status* of the unit
- The *Hide content from students* setting
- The use of *Content Groups*

For more information, see *Controlling Content Visibility*.

5.1.4 Making Course Content Searchable

Learners can search course text in *HTML components* and video transcripts by using the **Search** box in the upper-left corner of the **Courseware** tab.

Before learners can search your course, Studio must index the content. Studio indexes all new course content automatically when you *publish* the content.

If necessary, you can manually reindex all of the content in your course at any time. Typically, you would only manually reindex your course content if learners see unexpected search results. To reindex your course content, select **Reindex Content** in the upper-right corner of the **Course Outline** page. Reindexing usually takes less than 30 seconds.

5.1.5 Revising Content

You can revise your course content at any time.

- When you *reorganize sections, subsections, and units* in the outline, the new order is immediately visible to students if the section and subsection are released.

- When you *edit a unit*, or *components* within a unit, you must *publish* those changes to make them visible to students.

The following diagram summarizes the content revision workflow and content visibility:
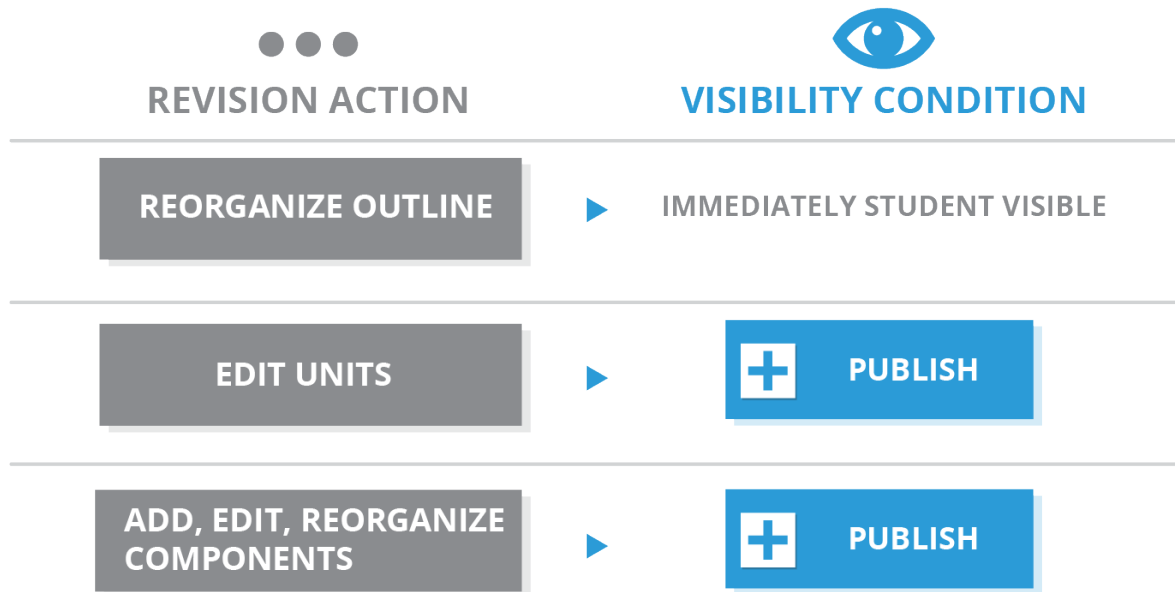
It is recommended that you *test course content* during the revision process.

5.2 Developing Your Course Outline

As you develop your course, you work primarily in the edX Studio course outline. This chapter includes the following information about working with the course outline:

- *Open the Course Outline*

- *Example of a Developed Course in the Outline*

- *View the Course Organization as a Student*

- *Navigate the Course Outline*

- *Add Content in the Course Outline*

- *Modify Settings for Objects in the Course Outline*
- *Publish Content from the Course Outline*
- *Reorganize the Course Outline*
- *Delete Content in the Course Outline*

See the following chapters for information about working with the course building blocks in the course outline:

- *Developing Course Sections*
- *Developing Course Subsections*
- *Developing Course Units*
- *Developing Course Components*

5.2.1 Open the Course Outline

To view the course outline:

1. Log in to edX Studio.

2. In the **My Courses** page, select the course you want to develop.

   The course outline opens by default when you open a course.

When working in a course, to open the outline, from the **Content** menu, select **Outline**.

The first time you view an outline for a course, it contains no content.
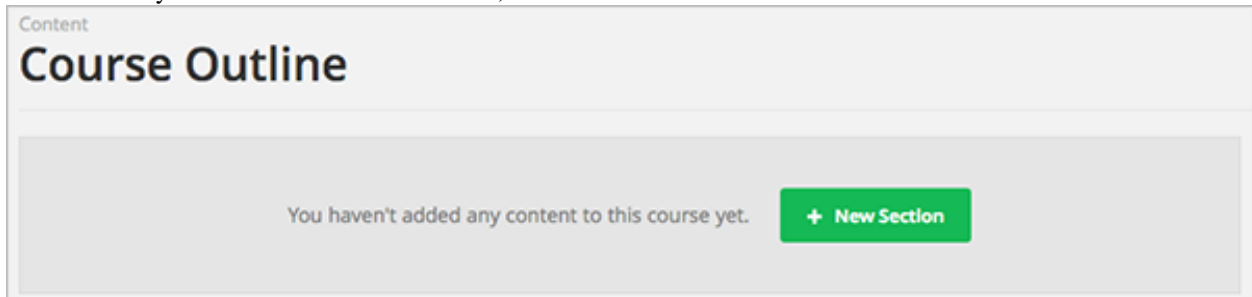
You must *create the first section*.

5.2.2 Example of a Developed Course in the Outline

The following example shows a sample course in the outline, with indications for sections, subsections, and units. As you develop your course, it will begin to look like this example:
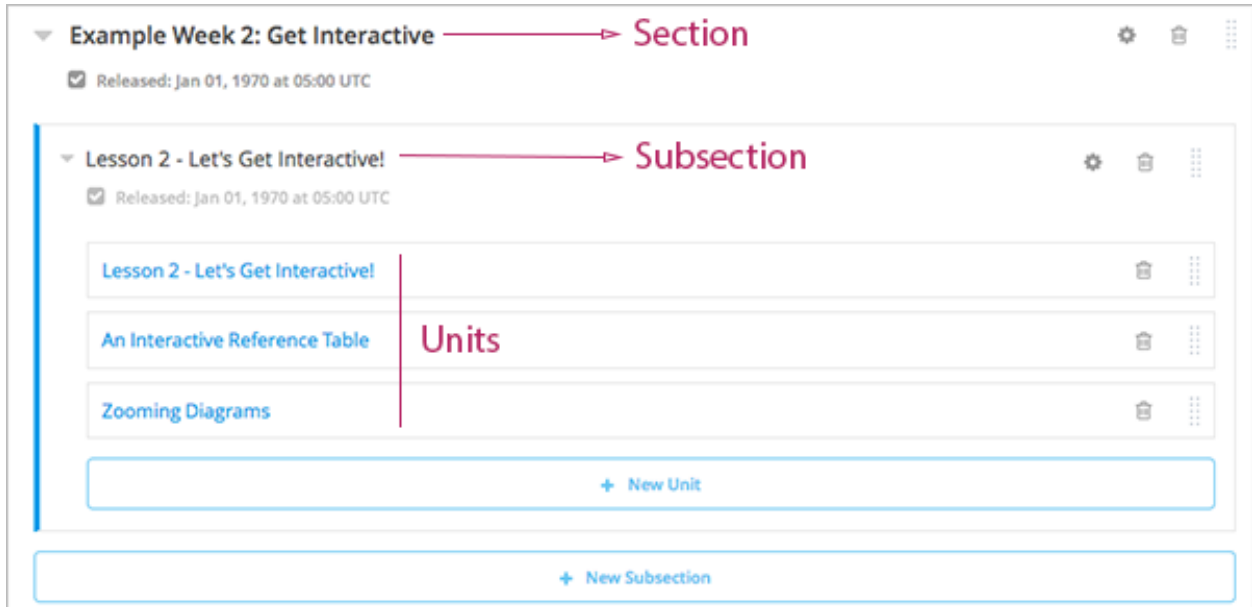
As this example shows, the course is organized into the following levels:

1. *Sections*

2. *Subsections*

3. *Units*

Components are not shown in the outline. You add or access components by clicking on the units that contain them.

Use the links above for more information and instructions on working with each type of object in the course. The rest of this chapter provides more detail about the course outline.

5.2.3 View the Course Organization as a Student

The content you see in the outline in Studio is displayed to students in the Courseware tab in the LMS. The following image shows how a student sees your course content:

5.2.4 Navigate the Course Outline

In Studio, you navigate the course outline by expanding and collapsing sections and subsections. Use the drop-down icon next to a section or subsection name to expand or collapse its contents:

When you expand a subsection, all units in the subsection are visible:
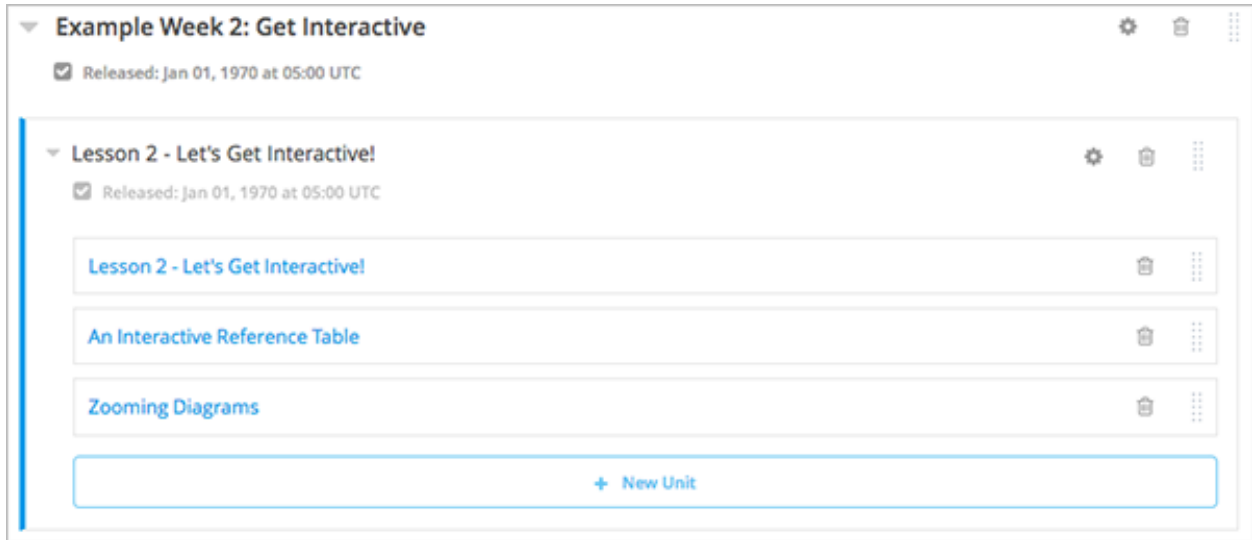
Click the name of a unit to open the *unit page*.

5.2.5 Add Content in the Course Outline

You add sections, subsections, and units directly in the outline.

To add a section to the end of the outline, click **New Section** at the top of the outline page or at the bottom of the outline:
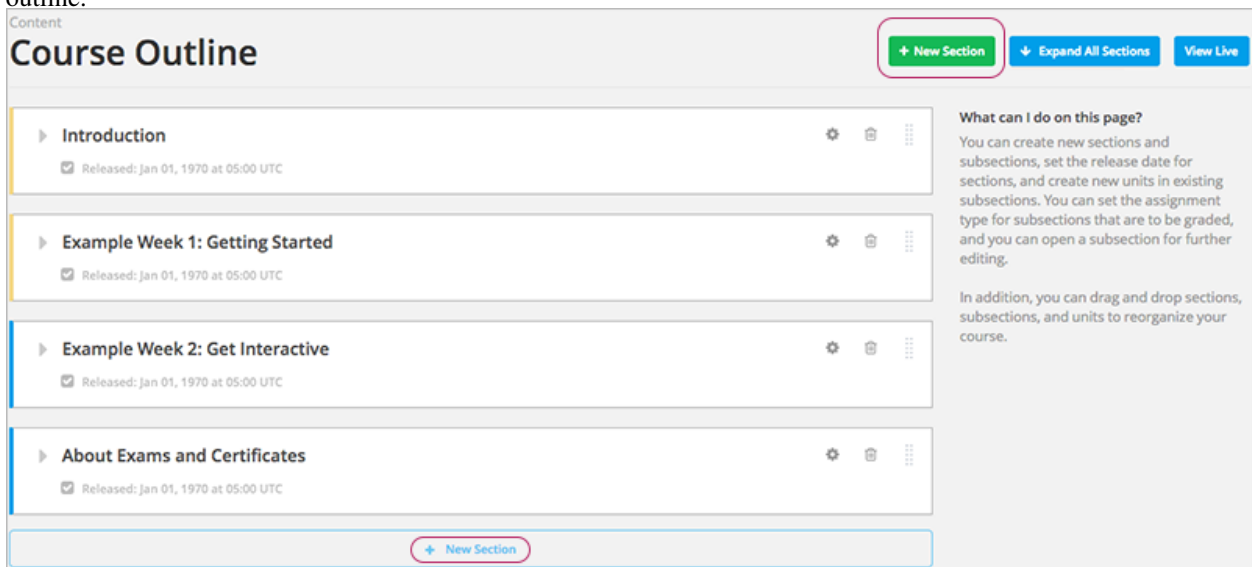
To add a subsection to the end of the section, expand the section and click **New Subsection**:
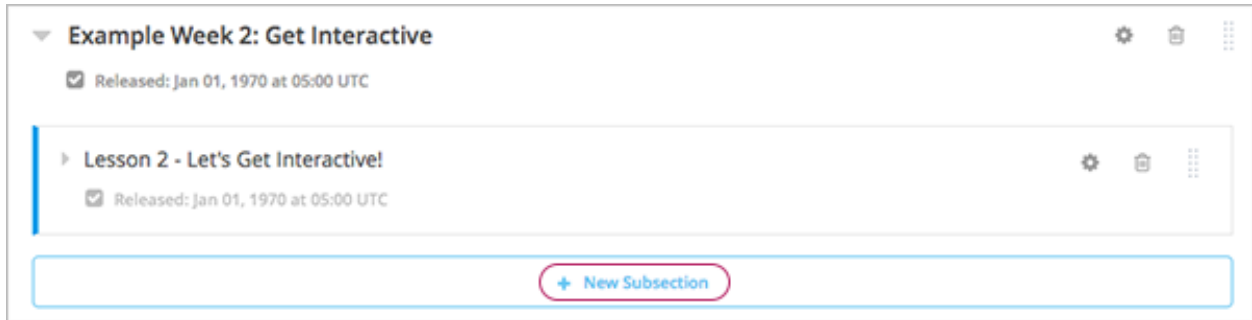
To add a unit to the end of a subsection, expand the subsection and click **New Unit**:
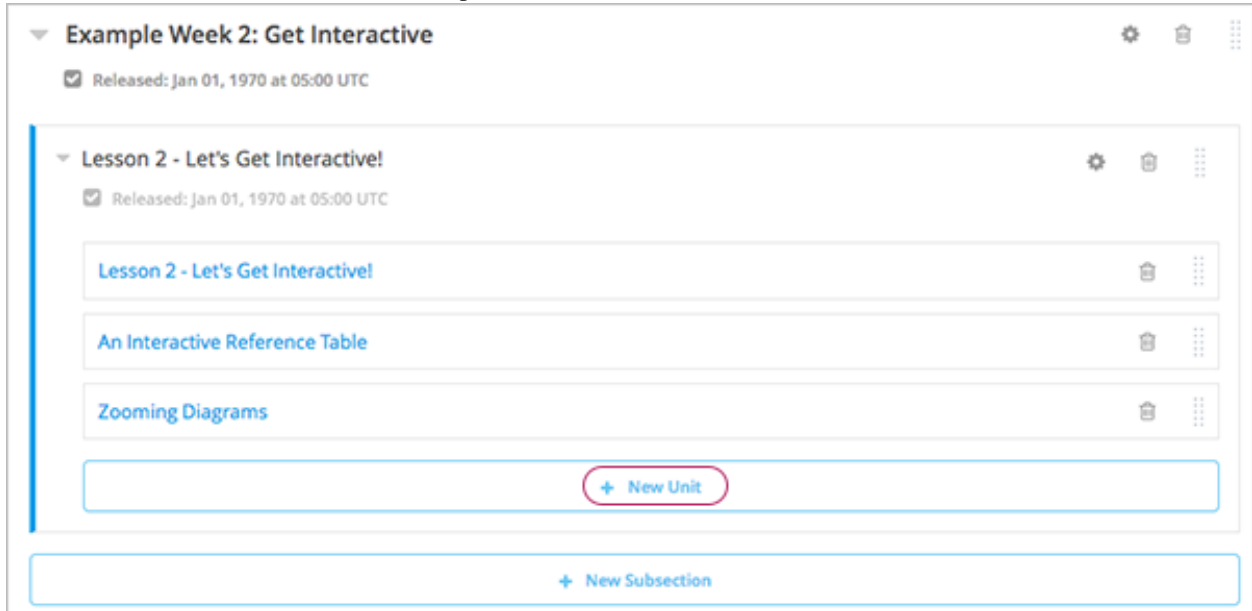
The *unit* page opens.

Note: If you want to require an entrance exam for your course, you also create the exam in the course outline. Before you can create an exam, you must set your course to require an entrance exam in Studio. For more information, see *Require an Entrance Exam*.

5.2.6 Modify Settings for Objects in the Course Outline

You modify settings for sections, subsections, and units in the course outline. Specifically, you can complete the following tasks:

- *Set a Section Release Date*
- *Hide a Section from Students*
- *Set a Subsection Release Date*
- *Set the Assignment Type and Due Date for a Subsection*
- *Hide a Subsection from Students*
- *Hide a Unit from Students*

To modify settings for a section, subsection, or unit, click the settings icon for that object. In the following example, the settings icon is circled for a section, a subsection, and two units:
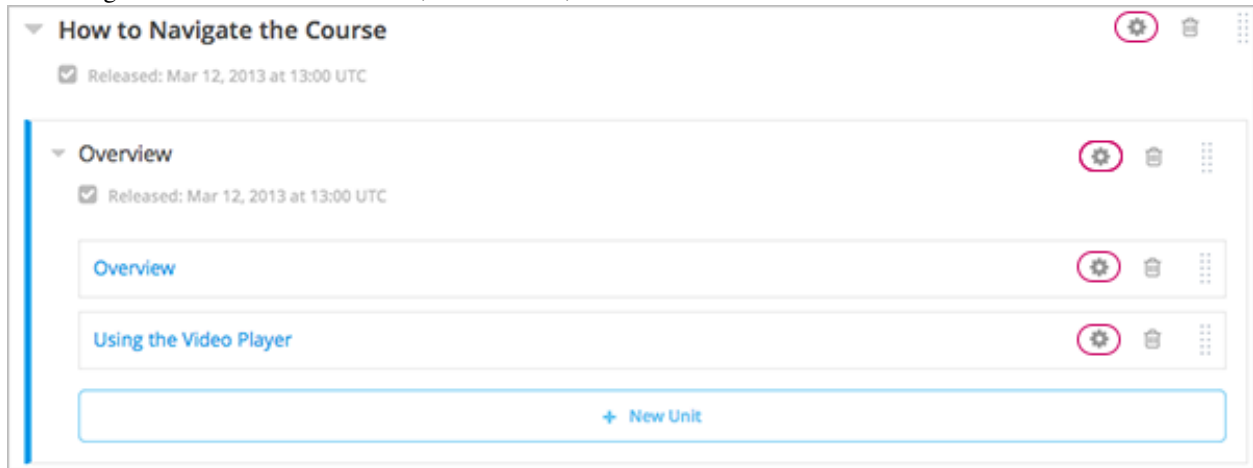
For more information, see the links above.

5.2.7 Publish Content from the Course Outline

You can publish new and changed units for an entire section or subsection. You can also publish individual units.

To publish new and changed units, click the publish icon for a section, subsection, or unit. In the following example, the publish icon is circled for a section, subsection, and unit:
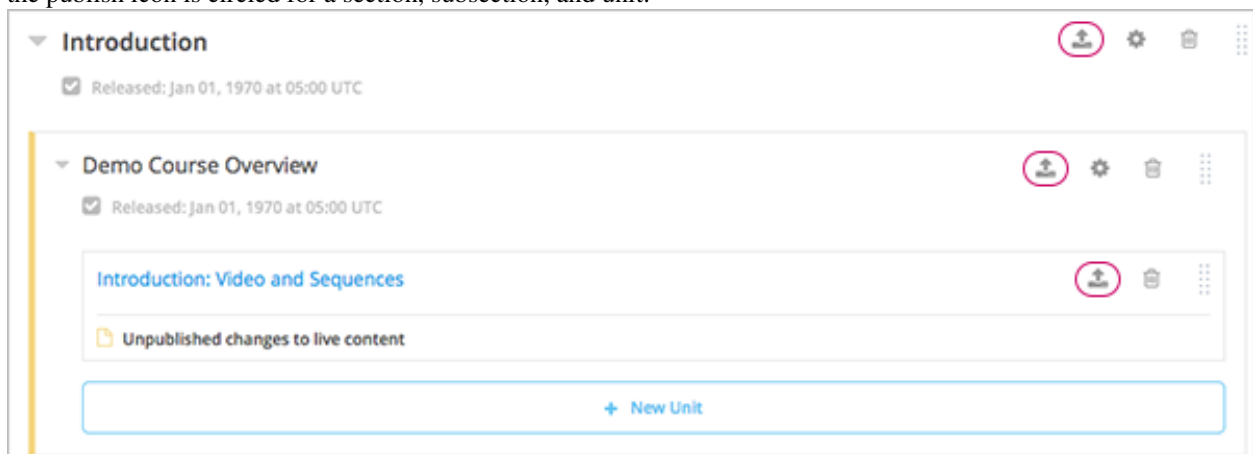
Note: The publish icon only appears when there is new or changed content within the object.

For more information, see:

- *Unit Publishing Status*
- *Publish all Units in a Section*
- *Publish all Units in a Subsection*
- *Publish a Unit*

5.2.8 Reorganize the Course Outline

You can reorganize your course content by dragging and dropping sections, subsections, and units to new locations in the outline.

To move a section, subsection, or unit, hover over the handle on the right of the object's box until the cursor changes to a four-headed arrow. For example, in the image below, the handle for the subsection Lesson 1 - Getting Started is selected:
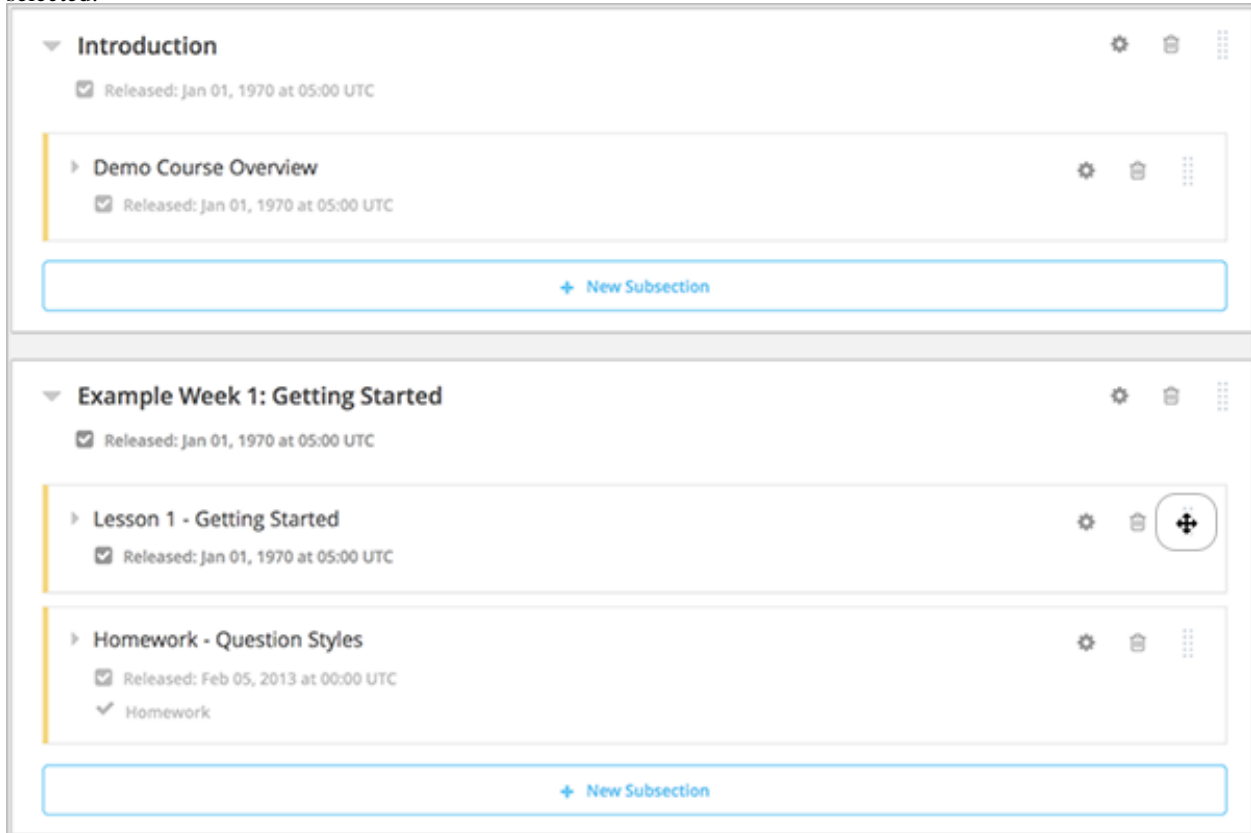
Then, click and drag the object to the location that you want.

If you expanded the section or subsection you are moving the object to, when you move the object, a blue line indicates where the object will land when you release the mouse button. For example, in the image below, the subsection Lesson 1 - Getting Started is being moved to the end of the section Introduction:
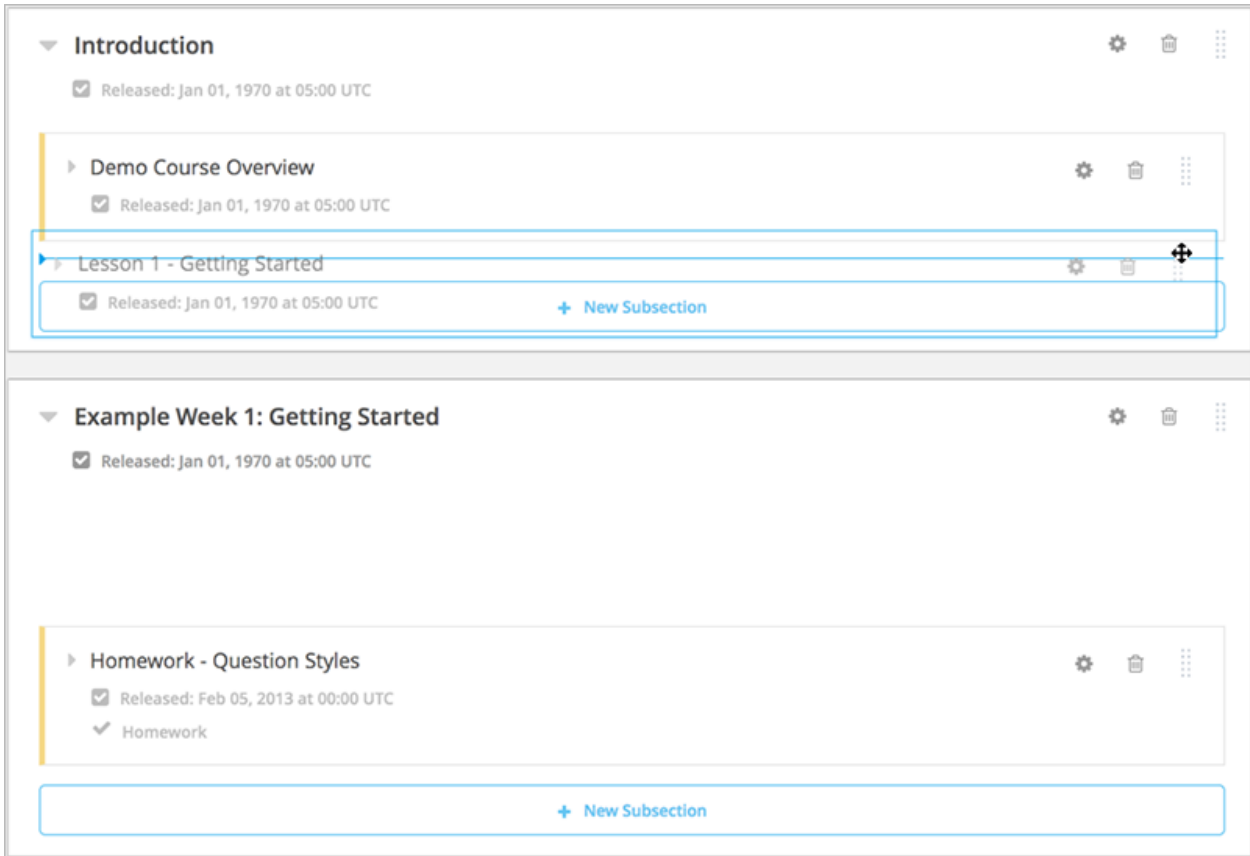
If you did not expand the section or subsection you are moving the object to, the outline of that section or subsection turns blue when you have moved the object to a valid location. You can then release the mouse button. For example, in the image below, the subsection Lesson 1 - Getting Started is being moved to the collapsed section Introduction:
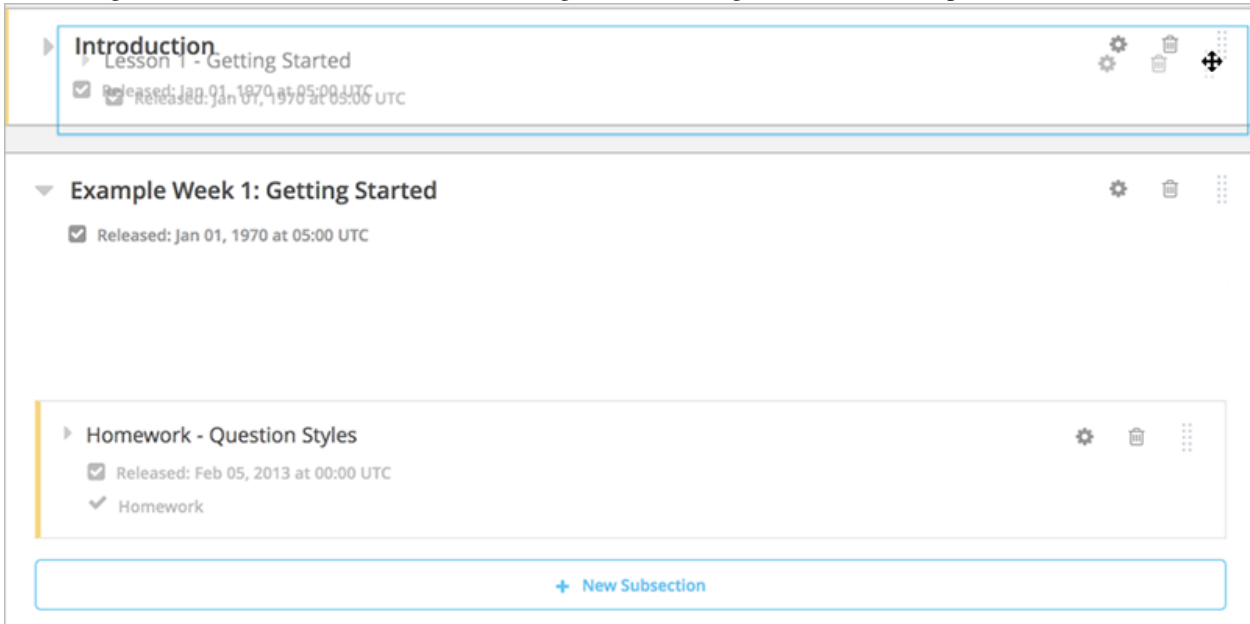
5.2.9 Delete Content in the Course Outline

You delete sections, subsections, and units from the course outline.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in your course that you set to never release.

Click the delete icon in the box for the object you want to delete:
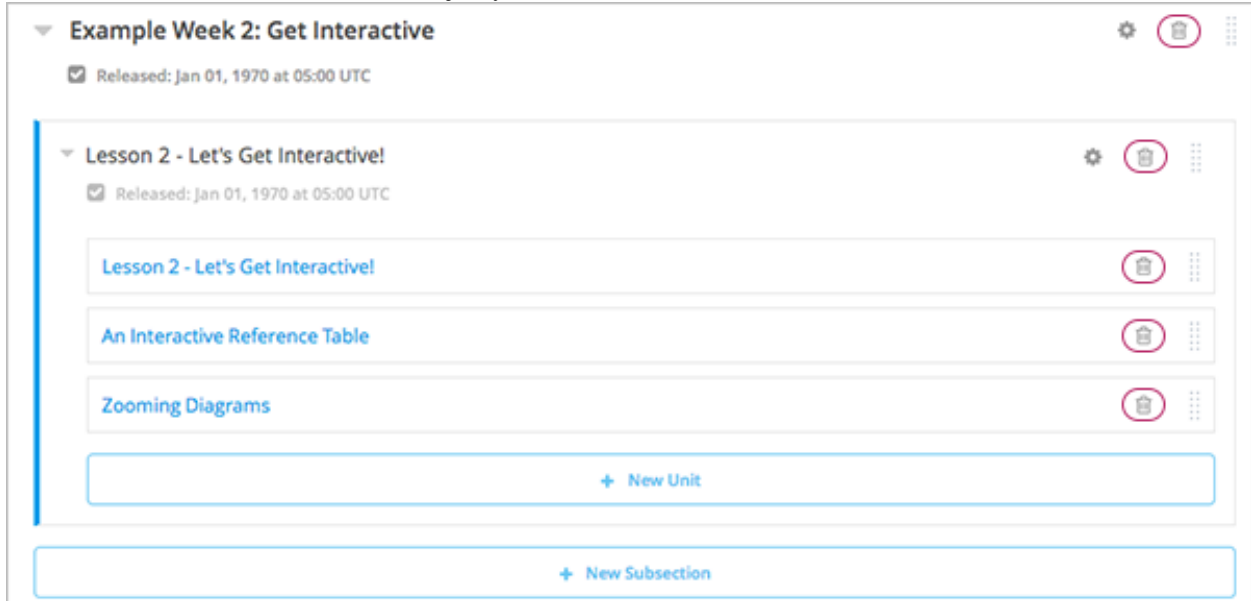
You are prompted to confirm the deletion.

> **Note:** When you delete an object, all objects that it contains are deleted. For example, when you delete a subsection, all units in that subsection are deleted.

5.3 Developing Course Sections

To develop sections in your course, you must first understand the following topics.

- *What is a Section?*
- *Viewing Sections in the Outline*
- *The Student View of a Section*
- *Sections and Visibility to Students*
- *Release Statuses of Sections*

Section tasks:

- *Create a Section*
- *Change a Section Name*
- *Set a Section Release Date*
- *Publish all Units in a Section*

- *Hide a Section from Students*

- *Delete a Section*

5.3.1 What Is a Section?

A section is the topmost category in your course. A section can represent a time period in your course, a chapter, or another organizing principle. A section contains one or more subsections.
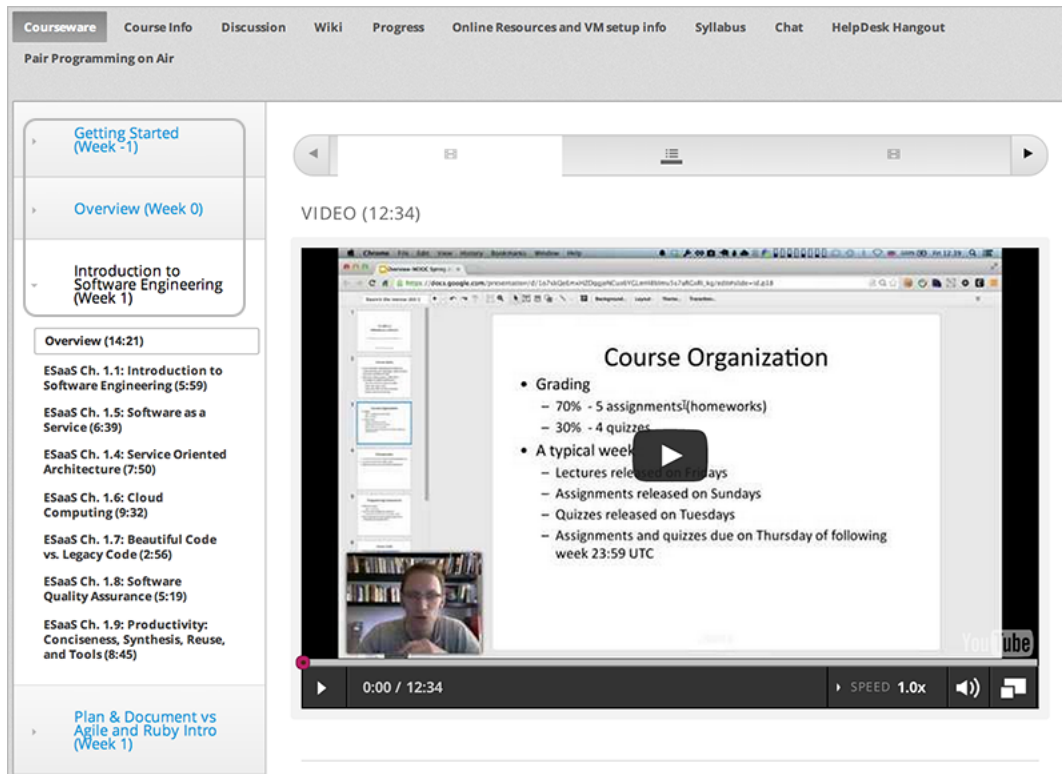
5.3.2 Viewing Sections in the Outline

The following example shows four sections, all collapsed, in the course outline.

5.3.3 The Student View of a Section

Students see sections in the **Courseware** tab. Students can expand one section at a time to see its contents. In the following example, three sections are circled, and the third one is expanded to show its subsections.

5.3.4 Sections and Visibility to Students

Students cannot see any content in the section if the section's release date is unscheduled or has not passed.

If a section's release date has passed, students can see content in the section if:

- The release date for the subsection that contains that content has passed.
- The unit has been published.
- The unit is not hidden from students.

5.3.5 Release Statuses of Sections

As an course author, you control the release status of sections. For the content of a section to be visible to students, the section must be released. See the following topics for more information about the possible release statuses of sections.

- *Unscheduled*
- *Scheduled*
- *Released*
- *Released with Unpublished Changes*
- *Staff Only Content*

Unscheduled

If you do not change the *course start date* default value, `1/1/2030 00:00:00 UTC`, when you create a new section, its release date will appear as `Unscheduled`. When the section release date is unscheduled, students cannot

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see any content in that section, regardless of the publishing status of that content.

If you have modified the course start date, when you create a new section, the default release date is the course start date.

The following example shows how an unscheduled section displays in the outline, summarized with a gray bar.

To make the content available to students, you must schedule the release date.

Scheduled

A section that is scheduled for release on a future date will not be visible to students until after the release date. Regardless of the publishing status of content within the section, the entire section will not visible to students.

The following example shows how a section that is scheduled for release displays in the outline, summarized with a green bar.

The scheduled date must pass for the section to be visible to students.

Released

A section that is released is visible to students; however, students see only subsections within the section that are also released, and units that are published.

The following example shows how a released section displays in the outline, summarized with a blue bar.

Released with Unpublished Changes

If you change a unit in a released section but do not publish the changes, students see the last published version of the modified unit.

The following example shows how a released section with unpublished changes displays in the outline, with a yellow bar. The section is expanded to show the unit with unpublished changes.
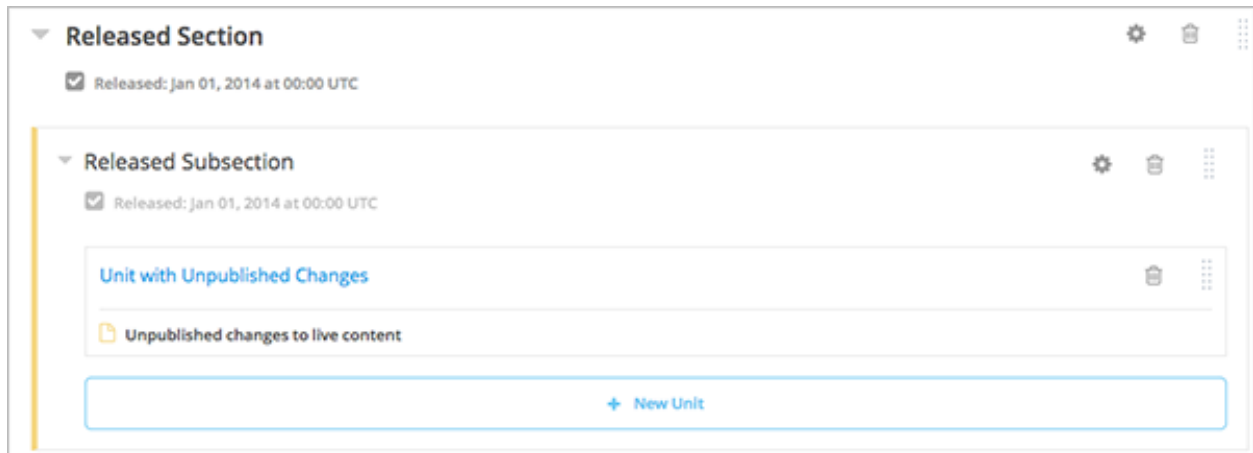
You must publish the unit for students to see the updates.

Staff Only Content

A section can contain a unit that is hidden from students and available to members of the course team only. That unit is not visible to students, regardless of the release date of the section or subsection.

The following example shows how a section that contains a unit that is hidden from students displays in the outline, summarized with a black bar.
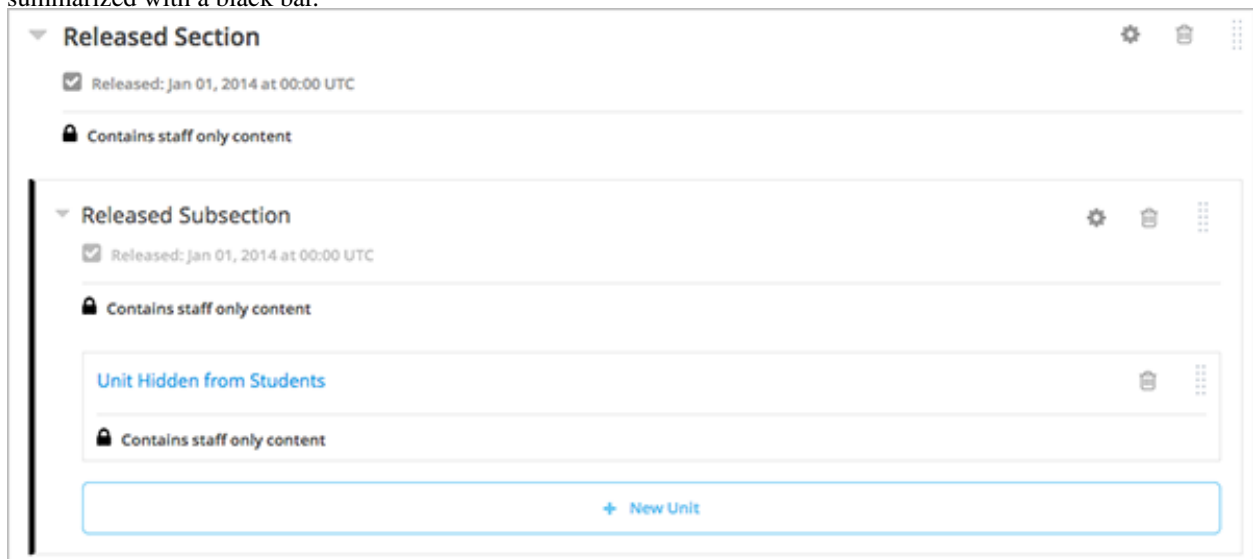
5.3.6 Create a Section

If you do not change the *course start date* default value, `1/1/2030`, when you create a new section, its release date will be `Unscheduled`.

If you have modified the course start date, when you create a new section, the default release date is the course start date.

> **Caution:** If the course start date is in the past, newly created sections are immediately visible to students.

To create a new section:

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1. Click **New Section** at the top or bottom of the outline:
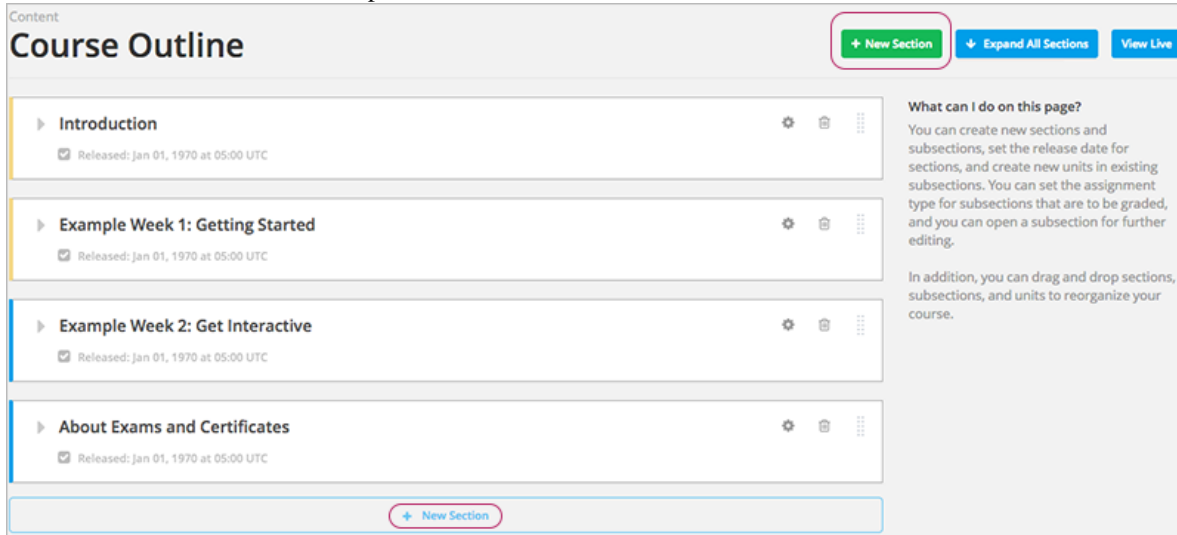
A new section appears at the end of the course content, with the section name selected.

2. Enter the name for the new section. A descriptive name can help learners locate content in the courseware. It can also help you select content when you analyze performance in edX Insights.

3. *Add subsections* to the new section as needed.

It is recommended that you *test course content* as you create new sections.

5.3.7 Change a Section Name

To edit a section name, hover over the section name to show the Edit icon.
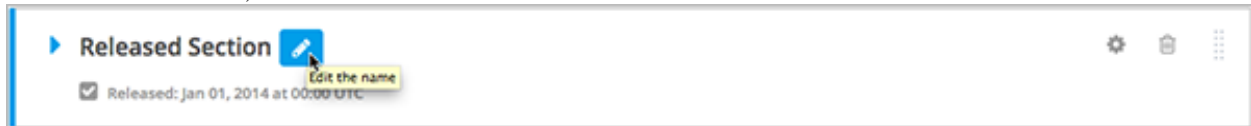
Click the Edit icon next to the section name. The name field becomes editable. Enter the new name and tab or click out of the field to save the name.

5.3.8 Set a Section Release Date

To set the section release date:

1. Click the Settings icon in the section box.

The **Settings** dialog box opens.

2. Enter the release date and time for the section.

3. Click **Save**.

For more information, see *Release Dates*.

5.3.9 Publish all Units in a Section

To publish all new and changed units in a section, click the publish icon in the box for the section.

Note: The publish icon only appears when there is new or changed content within the section.

See *Unit Publishing Status* for information about statuses and visibility to students.

5.3.10 Hide a Section from Students

You can hide all content in a section from students, regardless of the status of subsections and units within the section.

For more information, see *Content Hidden from Students*.

To hide a section from students:

1. Click the Settings icon in the section box.

The **Settings** dialog box opens.

2. Check **Hide from students**.
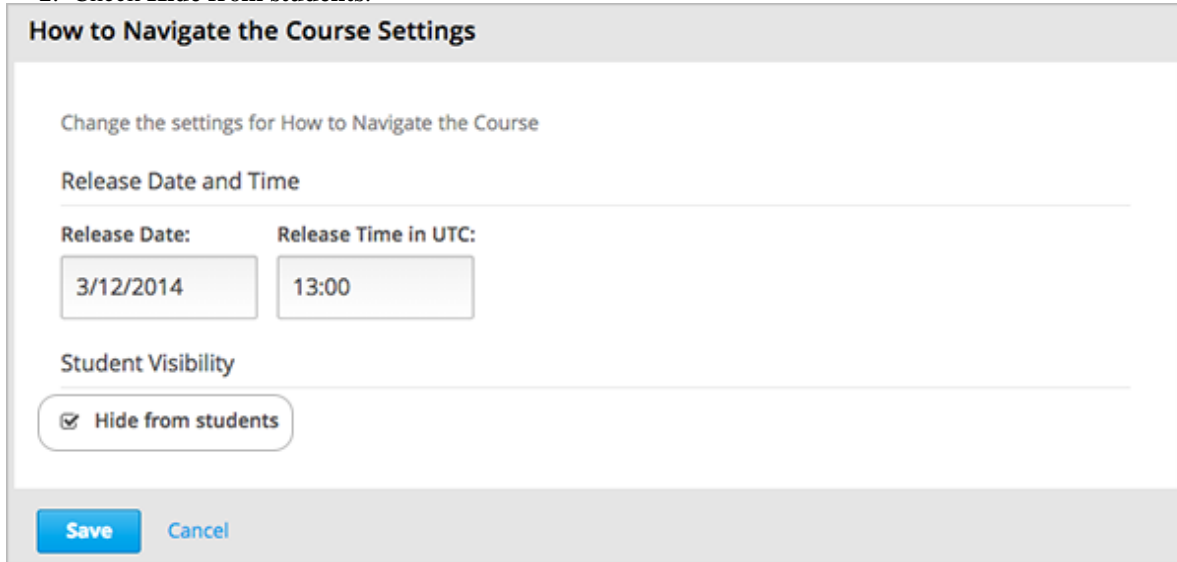
3. Click **Save**.

Now, no content in the section is visible to students.

To make the section visible to students, repeat these steps and clear the **Hide from students** check box.

> **Warning:** When you clear the **Hide from students** check box for a section, not all content in the section is necessarily made visible to students. If you explicitly set a subsection or unit to be hidden from students, it remains hidden from students. Unpublished units remain unpublished, and changes to published units remain unpublished.

5.3.11 Delete a Section

When you delete a section, you delete all subsections and units within the section.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in your course that you set to never release.

To delete a section:

1. Click the delete icon in the section that you want to delete.
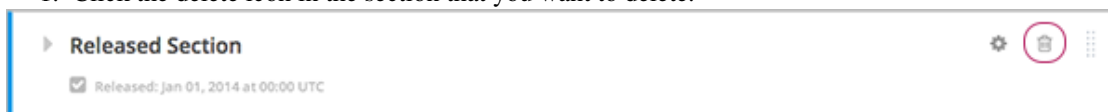
2. When you receive the confirmation prompt, click **Yes, delete this section**.

5.4 Developing Course Subsections

To develop subsections in your course, you must first understand the following topics.

- *What is a Subsection?*
- *Viewing Subsections in the Outline*
- *The Student View of a Subsection*
- *Subsections and Visibility to Students*
- *Release Statuses of Subsections*

Subsection tasks:

- *Create a Subsection*
- *Change a Subsection Name*
- *Set a Subsection Release Date*
- *Set the Assignment Type and Due Date for a Subsection*
- *Publish all Units in a Subsection*
- *Hide a Subsection from Students*
- *Delete a Subsection*

5.4.1 What Is a Subsection?

Sections are divided into subsections, which in turn contain one or more units. A subsection may represent a topic in your course, or another organizing principle. Subsections are sometimes called "lessons" or "learning sequences".

5.4.2 Viewing Subsections in the Outline

The following example shows three subsections in a section, all collapsed, in the course outline.
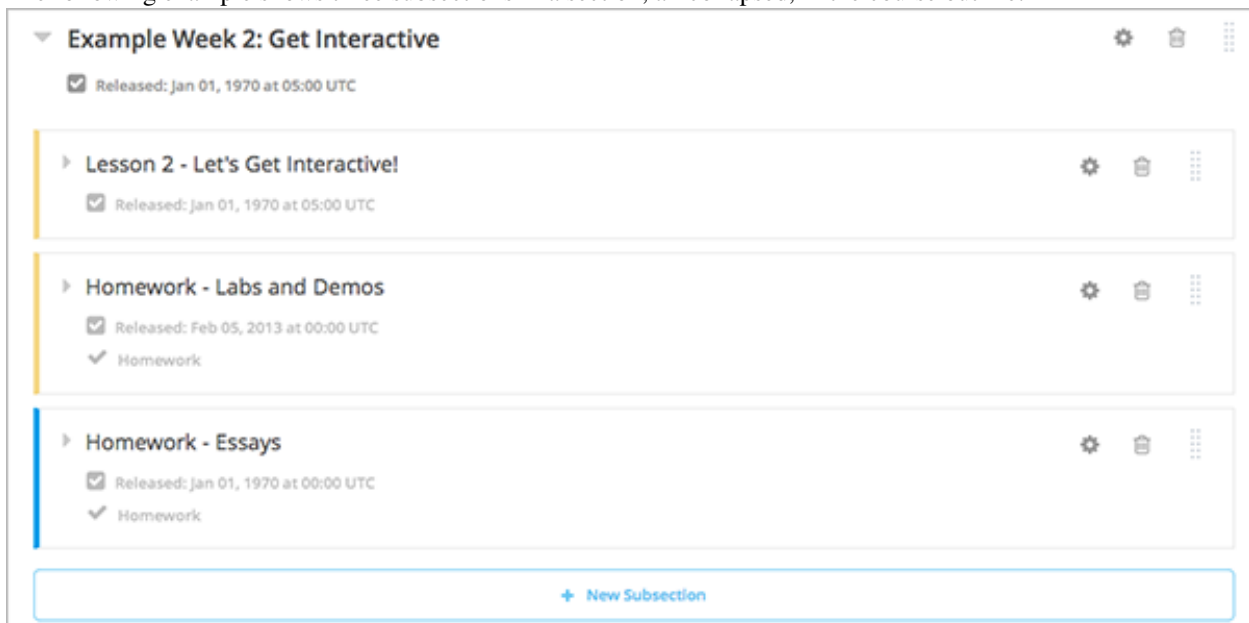
5.4.3 The Student View of a Subsection

Students see subsections in the Courseware tab, listed beneath the expanded section. In the following example, seven subsections are circled, and the first is open.

5.4.4 Subsections and Visibility to Students

Students cannot see any content in a subsection if the subsection's release date is unscheduled or has not passed.

If a subsection's release date has passed, students can see content in the subsection if the following three conditions are met.

- The release date of the parent section has passed.
- The units have been published.
- The units are not hidden from students.

5.4.5 Release Statuses of Subsections

As a course author, you control the release status of subsections. For the content of a subsection to be visible to students, the subsection must be released. See the following topics for more information about the possible release statuses of subsections.

- *Scheduled with the Section*
- *Unscheduled*
- *Scheduled Later than the Section*
- *Scheduled with Unpublished Changes*

- *Released with Unpublished Changes*
- *Released*

Scheduled with the Section

When you create a subsection, it is set by default to release at the same time as the section it is in. Therefore, published content in the subsection is visible to students at the date and time the section is released.

The following example shows how an subsection in the Scheduled with Section state displays in the outline, summarized with a green bar.
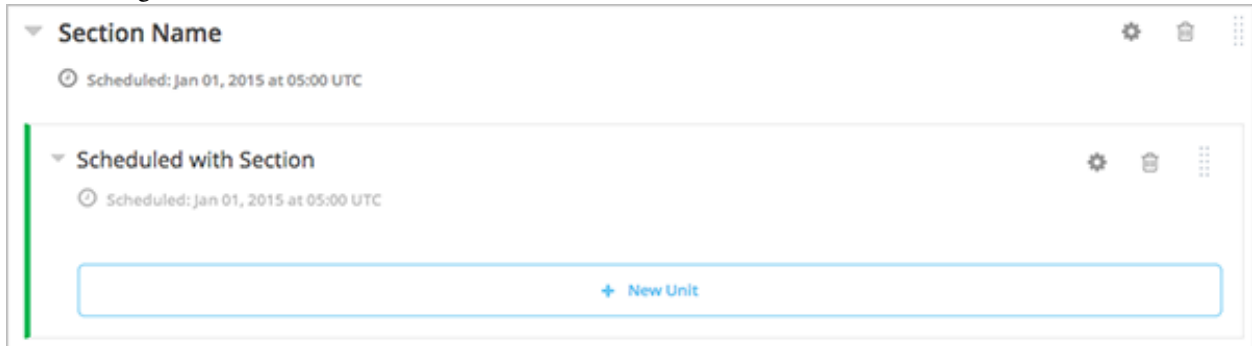
Unscheduled

If the parent section is unscheduled, when you create a new subsection it will also be unscheduled.

Regardless of the publishing status of units within the subsection, no content in an unscheduled subsection is visible to students.

The following example shows how an unscheduled subsection displays in the outline, summarized with a gray bar.
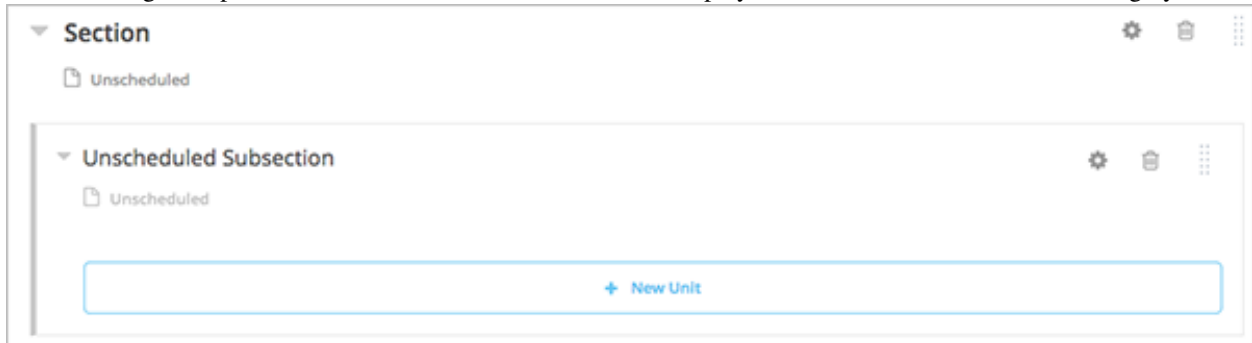
Content in the subsection is not visible to students until you set a release date and the date passes.

Scheduled Later than the Section

You can set a subsection to release on a date after the section releases.

Content in a subsection that is scheduled for release on a future date is not visible to students, even if some or all of the units in the subsection are published.

The following example shows the way that a subsection that will release after its parent subsection displays in the course outline.
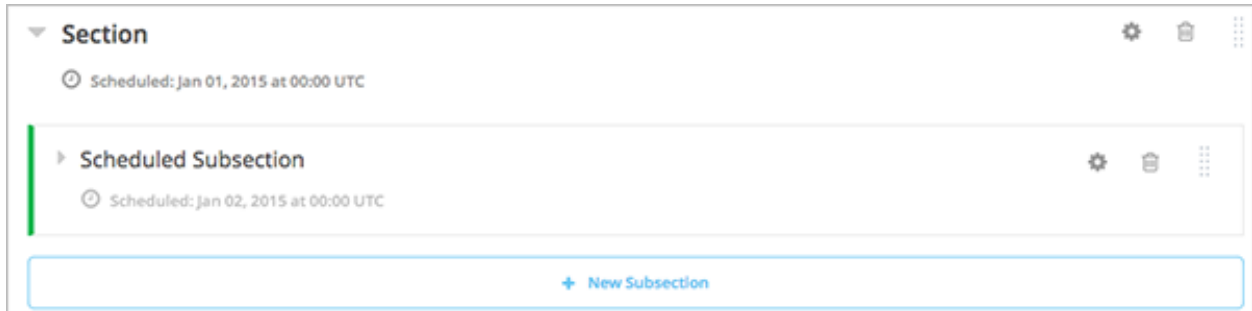
The scheduled date must pass for the subsection to be visible to students.

Scheduled with Unpublished Changes

You can make changes to a published unit before its parent subsection is released.

In this situation, when the release date for the subsection passes, the last published version of units within the subsection are made visible to students. The changes in units are not visible to students until you publish them.

The following example shows how a scheduled subsection with unpublished changes displays in the outline, summarized with a yellow bar.
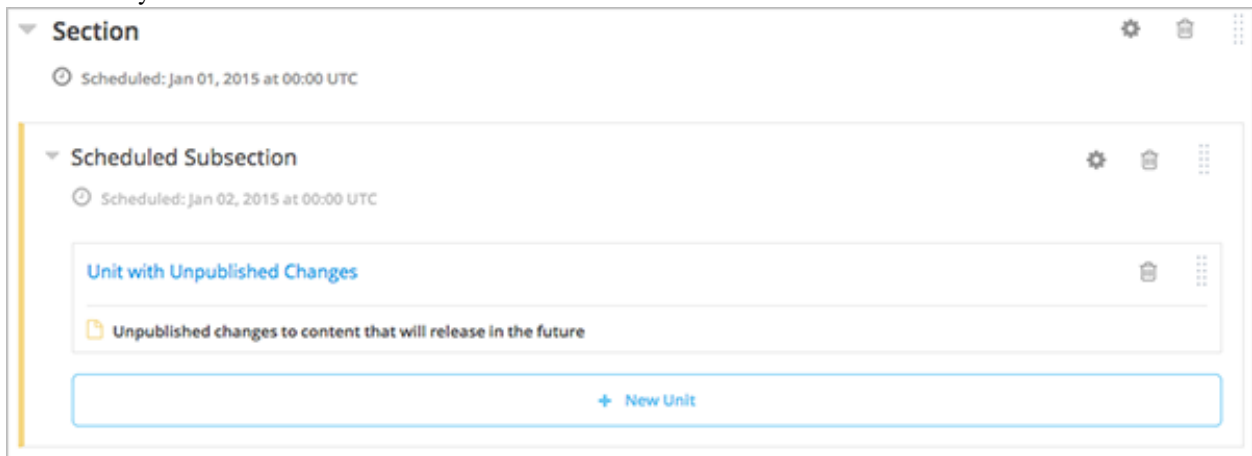
Released with Unpublished Changes

If you modify a unit within a released subsection, those modifications are not visible to students until you publish them.

The following example shows how a released section that has unpublished changes displays in the outline, summarized with a yellow bar.
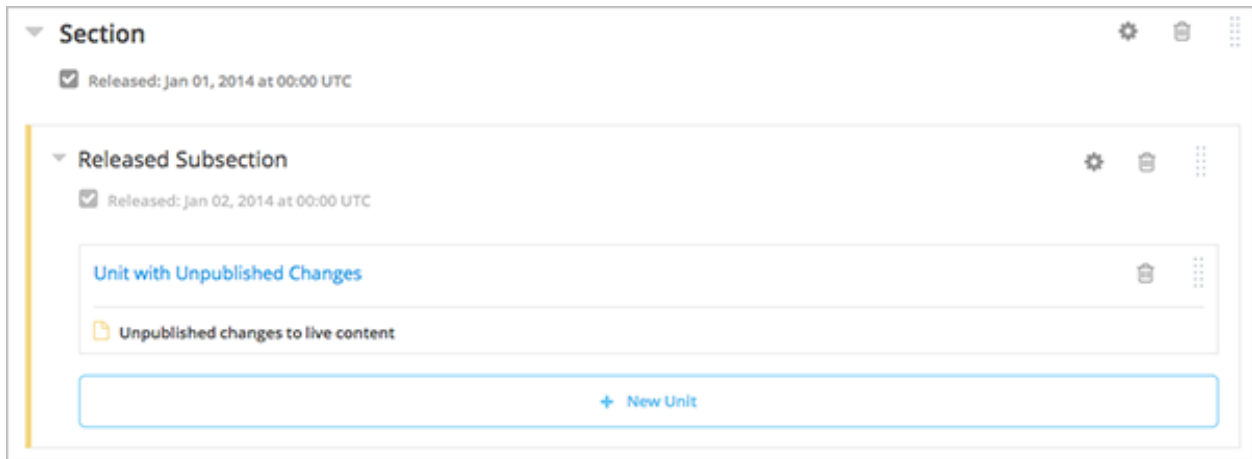
Released

A subsection that is released is visible to students; however, students see only units within the subsection that are published.

The following example shows how a released subsection displays in the outline, summarized with a blue bar.

Staff Only Content

A subsection can contain a unit that is hidden from students and available to members of the course team only. That unit is not visible to students, even if the subsection has been released.

The following example shows how a subsection that contains a unit that is hidden from students displays in the outline, summarized with a black bar.
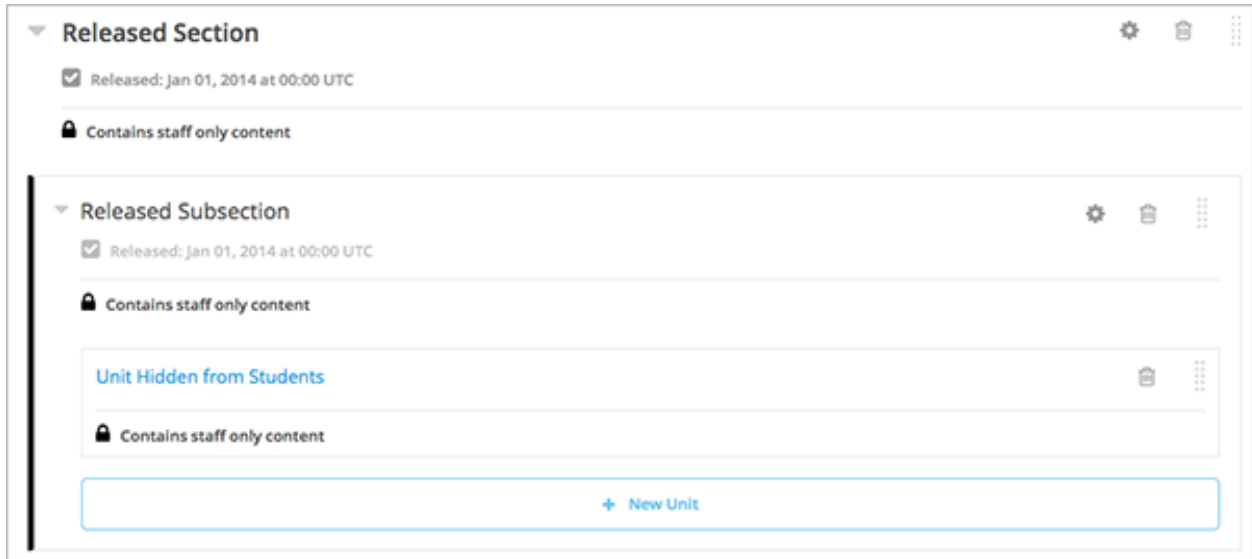
5.4.6 Create a Subsection

To create a new subsection:

1. In the outline, expand the section in which you want to create a new subsection.

2. Click **New Subsection** at the bottom of the expanded section. A new subsection appears at the end of the section, with the subsection name selected.

3. Enter the name for the new subsection. A descriptive name can help learners locate content in the courseware. It can also help you select content when you analyze performance in edX Insights.

4. *Add units* to the new subsection as needed.

It is recommended that you *test course content* as you create new subsections.

5.4.7 Change a Subsection Name

To change a subsection name, click the Edit icon next to the subsection name. The name field becomes editable. Enter the new name and tab or click out of the field to save the name.

5.4.8 Set a Subsection Release Date

To set the subsection release date:

1. Click the Settings icon in the subsection box.

   The **Settings** dialog box opens.

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2. Enter the release date and time for the section.

3. Click **Save**.

For more information, see *Release Dates*.

5.4.9 Set the Assignment Type and Due Date for a Subsection

You set the assignment type for problems at the subsection level.

When you set the assignment type for a subsection, all problems within the subsection are graded and weighted as a single type. For example, if you designate the assignment type for a subsection as **Homework**, then all problem types in that subsection are graded as homework.

Note: Unlike other problem types, ORA assignments are not governed by the subsection due date. Due dates for each ORA assignment are set in the assignment's settings. For details, see *Step 4. Specify the Assignment Name and Response Dates*.

To set the assignment type and due date for a subsection, follow these steps.

1. Click the Settings icon in the subsection box.

The Settings dialog box opens.

2. Select the assignment type for this subsection in the **Grade as** field.

3. Enter or select a due date and time for problems in this subsection.

4. Click **Save**.

For more information, see *Establishing a Grading Policy*.

5.4.10 Publish all Units in a Subsection

To publish all new and changed units in a subsection, click the publish icon in the box for the subsection.
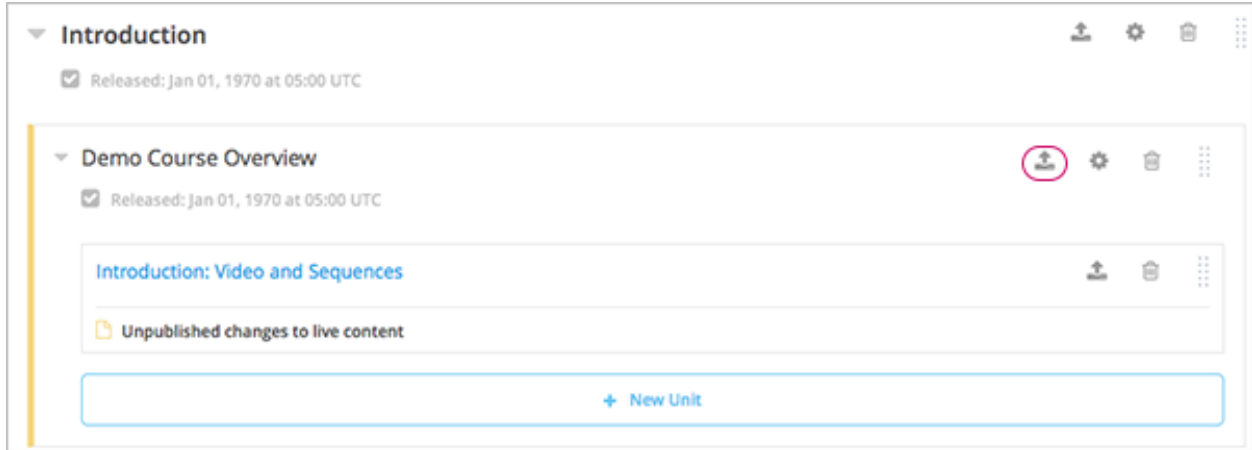
Note: The publish icon only appears when there is new or changed content within the subsection.

See *Unit Publishing Status* for information about statuses and visibility to students.

5.4.11 Hide a Subsection from Students

You can hide all content in a subsection from students, regardless of the status of units within the section.

For more information, see *Content Hidden from Students*.

To hide a subsection from students:
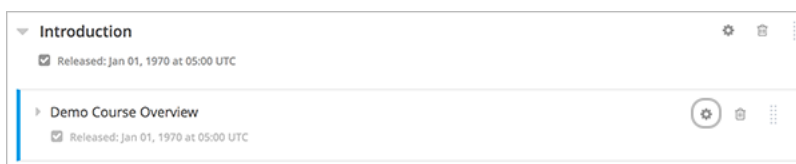
1. Click the Settings icon in the subsection box.

   The **Settings** dialog box opens.

2. Check **Hide from students**.

3. Click **Save**.

Now, no content in the subsection is visible to students.

To make the subsection visible to students, repeat these steps and clear the **Hide from students** check box.

> **Warning:** When you clear the **Hide from students** check box for a subsection, not all content in the subsection is necessarily made visible to students. If you explicitly set a unit to be hidden from students, it remains hidden from students. Unpublished units remain unpublished, and changes to published units remain unpublished.

5.4.12 Delete a Subsection

When you delete a subsection, you delete all units within the subsection.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in your course that you set to never release.

To delete a subsection:

1. Click the delete icon in the subsection that you want to delete.

2. When you receive the confirmation prompt, click **Yes, delete this subsection**.

5.5 Developing Course Units

When working with units in the course outline, ensure you understand the following topics.

- *What is a Unit?*
- *Viewing Units in the Outline*
- *Viewing the Unit Page*
- *Viewing Units as a Student*
- *Unit Publishing Status and Visibility to Students*
- *Unit Publishing Status*

When developing your course, you complete the following tasks with units.

- *Create a Unit*
- *Edit a Unit*
- *Preview a Unit*
- *Publish a Unit*
- *Discard Changes to a Unit*
- *View a Published Unit*
- *Hide a Unit from Students*
- *Delete a Unit*

You add content to units with *course components*.

5.5.1 What is a Unit?

A unit is a part of a *subsection* that students view as a single page.

A unit contains one or more *components*, such as *HTML content*, *problems*, *discussions*, and *videos*.

5.5.2 Viewing Units in the Outline

To view units in the outline, you *expand* the parent section and subsection.
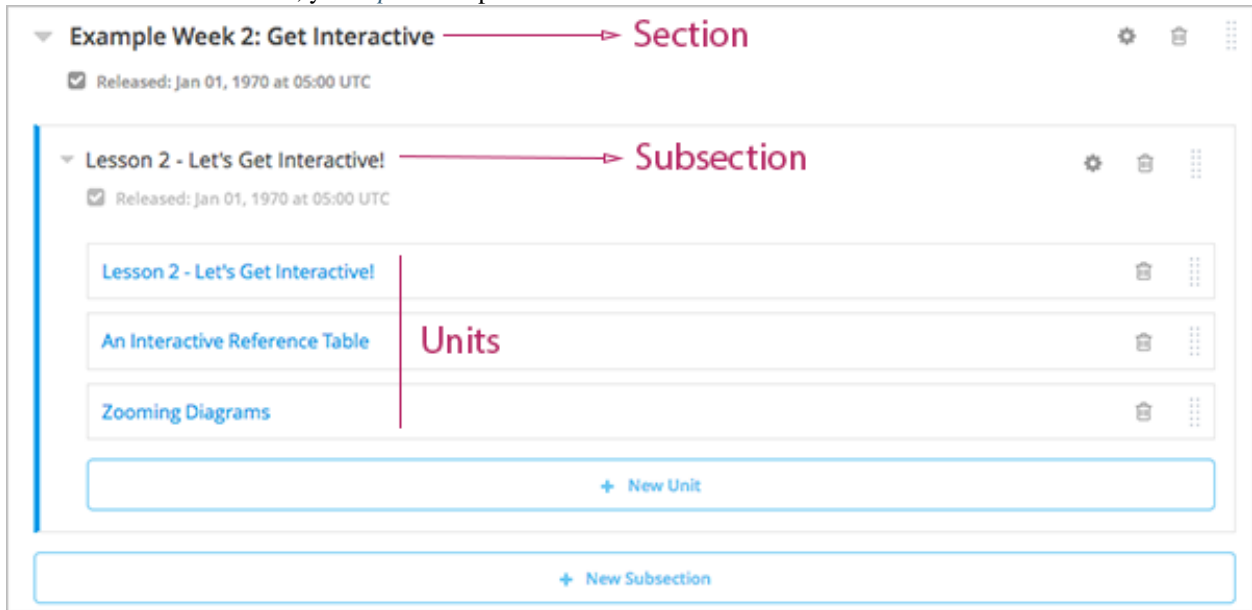
5.5.3 Viewing the Unit Page

When you click on a unit name in the outline, the **Unit** page opens.

The following example shows a unit page with two components, with circles and text to show different areas and controls in the page.

5.5.4 Viewing Units as a Student

To a student using the edX Learning Management System, each unit in the subsection appears as a link in the learning sequence at the top of the **Courseware** page. The contents of the active unit appear below the learning sequence.

The following image shows a subsection that has five units, which are circled in the learning sequence above the video, with the first unit open.

5.5.5 The Unit Workflow

When you have set up the *section* and *subsection* in the course outline, you then work with units.

The typical workflow is:

1. *Create a new unit*.
2. *Add components to the unit*.
3. *Publish the unit*.

After you publish the unit, you can:

1. *Modify components in the unit*.
2. *Publish the changes to the unit*.

The following diagram shows the typical unit development workflow.

As you work through these steps, the **publishing status** of the unit changes. The publishing status controls the content available to students, along with *release dates*. See the next section for more information.

5.5.6 Unit Publishing Status and Visibility to Students

The following information summarizes whether or not students can see a unit.

- Students never see a unit with the publishing status *Draft (Never Published)*.
- Students never see a unit with the publishing status *Visible to Staff Only*. See *Hide a Unit from Students* for more information.
- Students do not see a unit with the publishing status *Published Not Yet Released* until the *release date*. On the release date, the status changes to *Published and Live*.
- If the publishing status is *Published and Live*, students see the current version of the unit.
- If the publishing status is *Draft (Unpublished Changes)*, students see the last published version of the unit if the *release date* for the containing section and subsection has passed.

For more information, see *Controlling Content Visibility*.

5.5.7 Unit Publishing Status
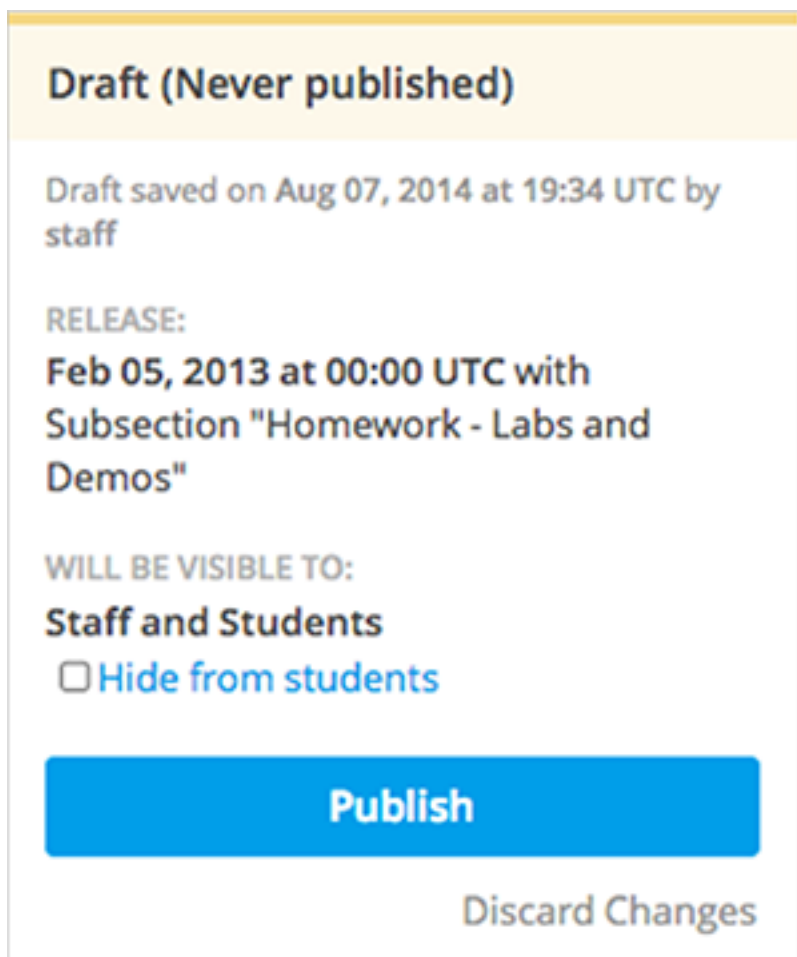
As an course author, you work with units with the following statuses.

- *Draft (Never published)*
- *Published and Live*
- *Published (not yet released)*
- *Draft (Unpublished changes)*
- *Visible to Staff Only*

Draft (Never published)

When you create a new unit and add components to it, the unit's publishing status is **Draft (Never Published)**, as shown in the status panel.

In Studio, you see the version of the content that you're working on. Students never see a unit with this status, even if the release date has passed.

Though you do not see the unit in the LMS, you can *preview the unit*.

You must *publish the unit* for it to be included in the LMS.

Published and Live

The release date for the section and subsection have passed. You've published the unit and haven't made any changes to it. You and students both see the current version of the unit.

Published (not yet released)

You've published the unit, but the release date hasn't passed. Students cannot see this unit until the release date passes.

Draft (Unpublished changes)

When you edit a published unit, whether or not it is released, the unit's publishing status changes to **Draft (Unpublished Changes)**, as shown in the status panel.

In Studio, you see the draft of the content that you're working on. If the release date has passed, students see the last published version of the unit. If the release date hasn't passed, students can't see your content.

You must *publish the unit* for students to see your changes.

You can *preview the changes to a unit* to test how your changes will appear to students after you publish the unit.

Visible to Staff Only

When you *hide a unit from students*, the unit's publishing status changes to **Visible to Staff Only**.

The publishing status of a unit can be **Visible to Staff Only** if you hid the parent *section* or *subsection* from students.

Students never see a unit with this status, even if it has been published and the release date has passed.

Visible to Staff Only

Last published Aug 07, 2014 at 19:42 UTC by staff

RELEASE:

~~Jan 01, 2015 at 05:00 UTC with Subsection "Lesson 2 - Let's Get Interactive!"~~

WILL BE VISIBLE TO:

Staff Only
☑ Hide from students

Publish

Discard Changes

5.5.8 Create a Unit

You can create a unit from the outline or create a unit in the same subsection from the unit page.

To create a unit from the outline:

1. In the outline, expand the subsection in which you want to create a new unit.

2. Click **New Unit** at the bottom of the expanded subsection. A new page opens for you to add components to the unit.

3. On the unit page, the unit name is selected. Supply an identifying name. A descriptive name can help learners locate content in the courseware. It can also help you select content when you analyze performance in edX Insights.

4. *Add components* to the new unit as needed.

To create a new unit from a unit page:

1. In the **Unit Location** panel, click **New Unit**.

The unit page for the new unit opens automatically.

2. On the unit page, the unit name is selected. Supply an identifying name. A descriptive name can help learners locate content in the courseware. It can also help you select content when you analyze performance in edX Insights.

3. *Add components* to the new unit as needed.

You must then *publish the unit* to make it visible to students.

5.5.9 Edit a Unit

You can edit a unit in the following ways.

- *Edit the unit name*
- *Develop components*
- *Reorganize Components in Units*

When you make any of these changes, if you previously published the unit, the state changes to *Draft (Unpublished Changes)*. You must then *publish the unit* to make your edits visible to students.

Edit the Unit Name

To edit a unit name, click the Edit icon next to the name.
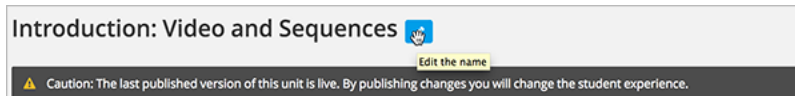
The name field becomes editable. Enter the new name and then press the Tab key or click out of the field to save the name.

Reorganize Components in Units
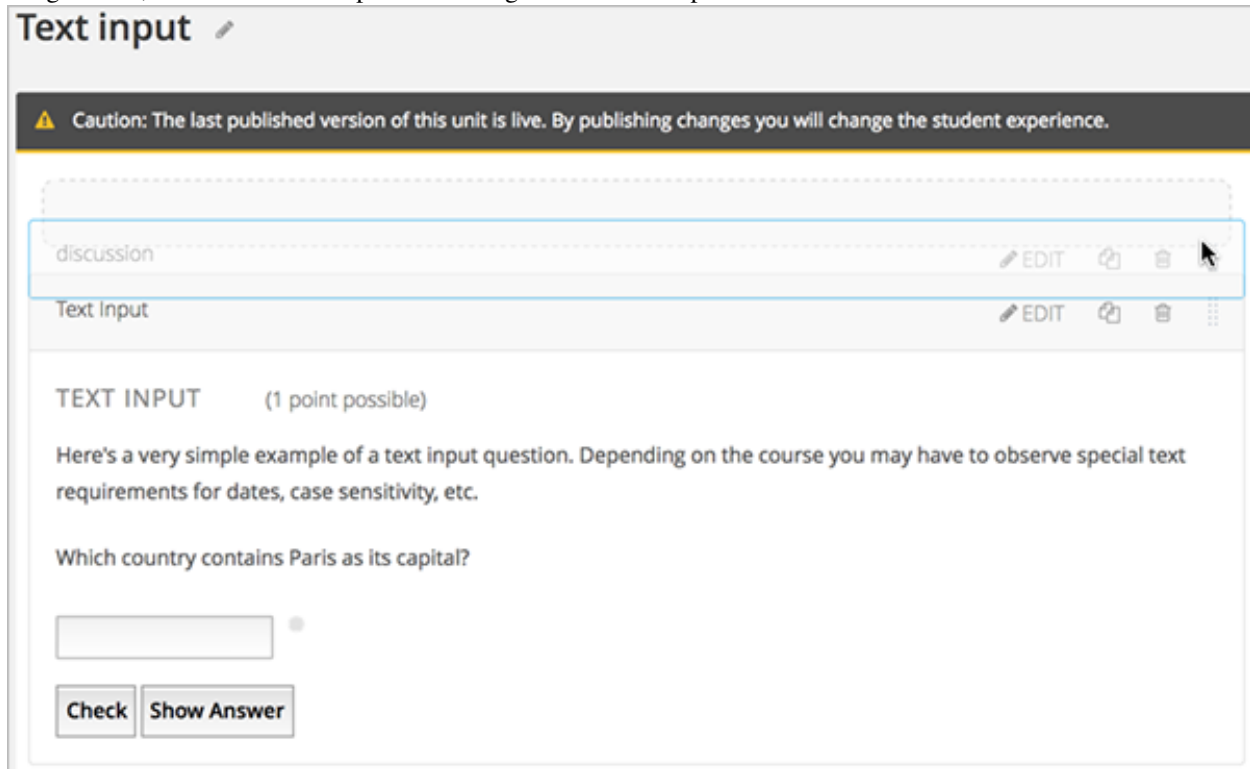
You can reorganize components within a unit by dragging and dropping them to new locations.

To move a component, hover over the handle on the right of the component's box until the cursor changes to a four-headed arrow. For example, in the image below, the handle for the discussion component is selected.
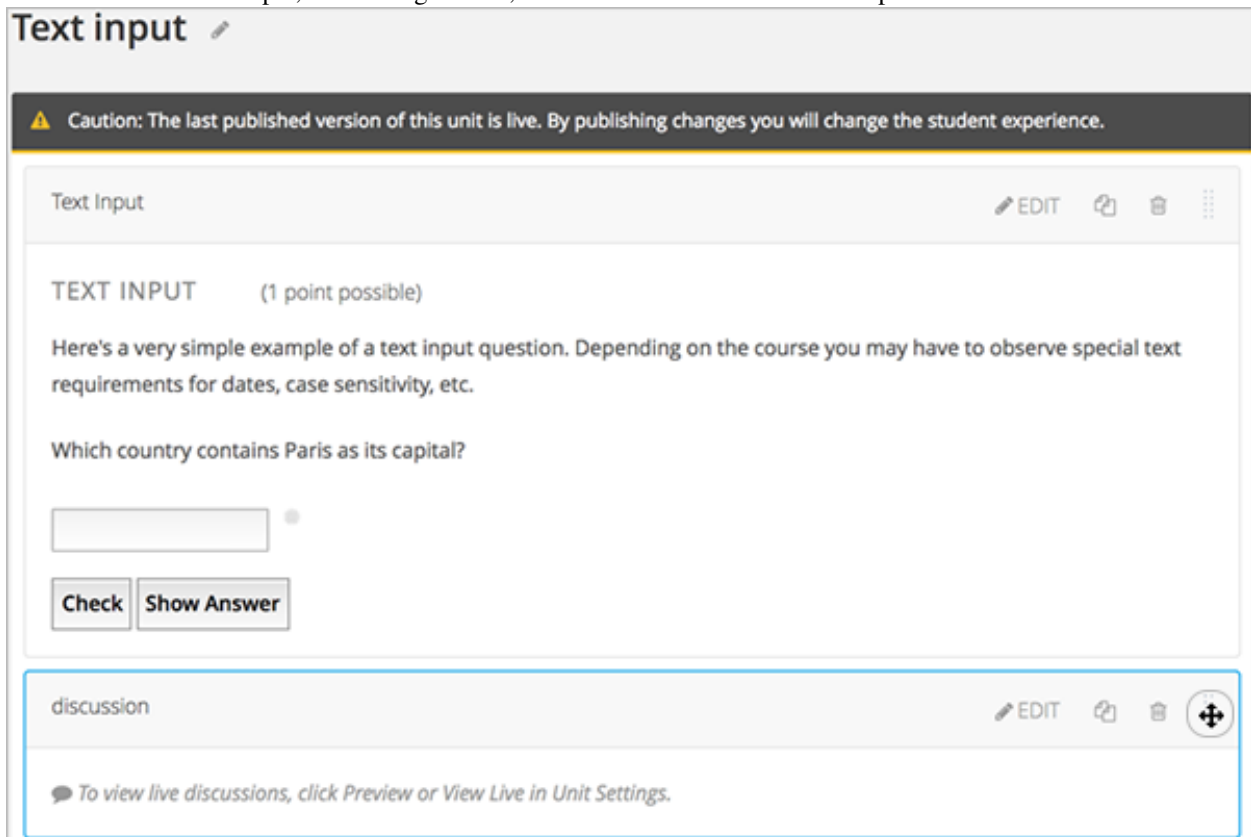
Then, click and drag the component to the location that you want.

A dashed outline indicates where the component will land when you release the mouse button. For example, in the image below, the discussion component is being moved to the top of the unit.
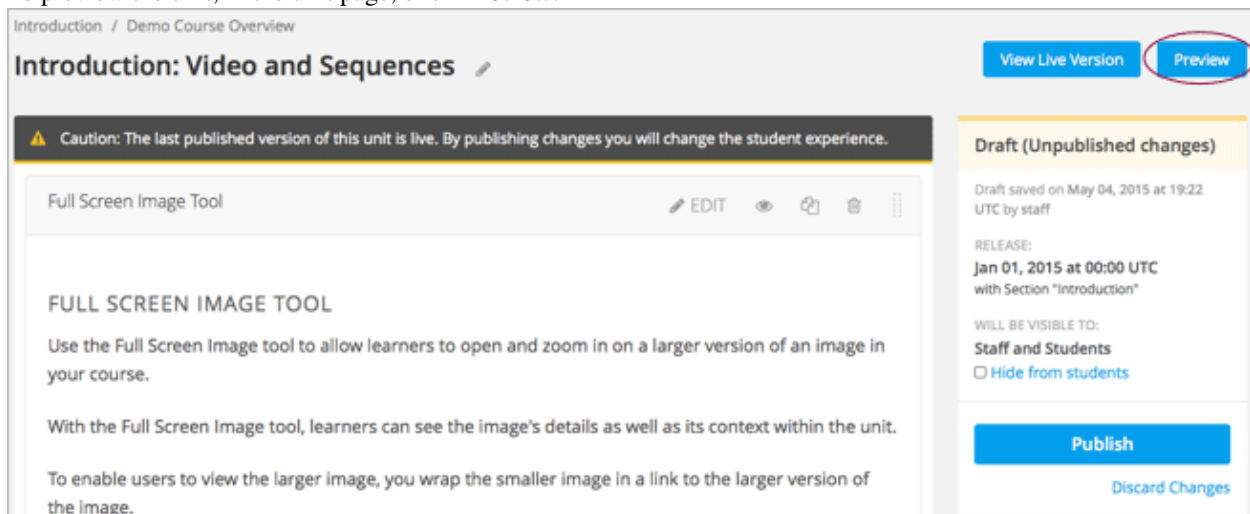
5.5.10 Preview a Unit

You preview a unit to review and test the content before it is visible to students.

You can preview a unit before it is published and before the course is live. In a live course, after the unit is published and if there are no pending changes, previewing a unit is exactly the same as viewing the live version of the unit.

To preview the unit, in the unit page, click **Preview**.

The unit opens in preview mode.
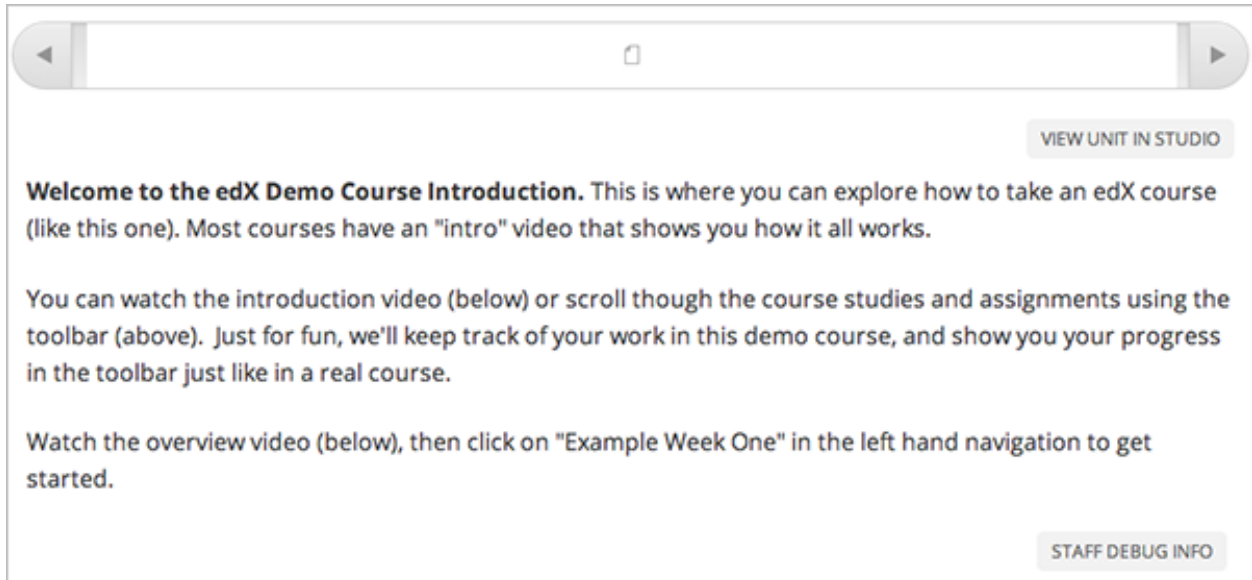
When you are revising a previously published unit, it is helpful to preview your changes in one window and *view the published unit* in a second window.

For more information about previewing courseware, see *Preview Course Content*.

5.5.11 Publish a Unit

Publishing a unit makes the current version of the unit in Studio available to students, if the release date for the section and subsection have passed.

You publish a unit that has a status of *Draft (Never Published)* or *Draft (Unpublished Changes)*. When you publish a unit, the status changes to *Published and Live* or *Published Not Yet Released*.

You can publish a unit from the unit page or the course outline.

Use the Unit Page to Publish a Unit

To publish the unit, click **Publish** in the status panel:

Use the Outline to Publish a Unit

To publish a unit from the outline, click the publish icon in the box for the unit:
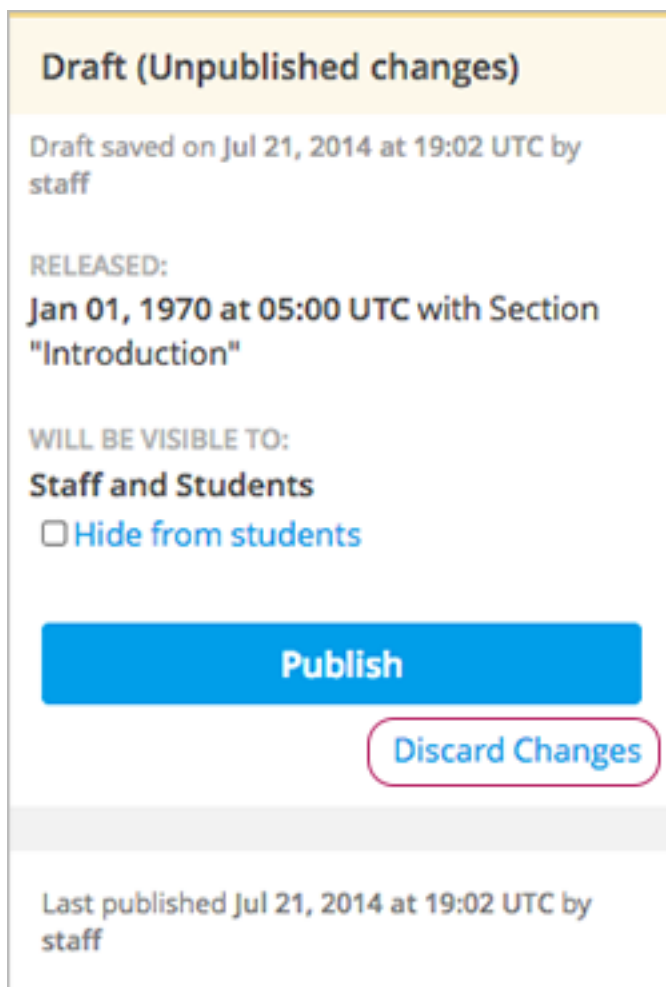
Note: The publish icon only appears when there is new or changed content in the unit.

5.5.12 Discard Changes to a Unit

When you modify a published unit, your changes are saved in Studio, though the changes aren't visible to students until you publish the unit again.

In certain situations, you may decide that you never want to publish your changes. You can discard the changes so that Studio reverts to the last published version of the unit.

To discard changes and revert the Studio version of the unit to the last published version, click **Discard Changes** in the status panel.

> **Caution:** When you discard changes to a unit, the changes are permanently deleted. You cannot retrieve discarded changes or undo the action.

5.5.13 View a Published Unit

To view the last published version of a unit in the LMS, click **View Live Version**.

The unit page opens in the LMS in Staff view. You may be prompted to log in to the LMS.

If the unit status is *Draft (Unpublished Changes)*, you do not see your changes in the LMS until you publish the unit again.

If the unit status is *Draft (Never Published)*, the **View Live Version** button is not enabled.

5.5.14 Hide a Unit from Students

You can prevent students from seeing a unit regardless of the unit status or the release schedules of the section and subsection.

For more information, see *Content Hidden from Students*.

You can hide a unit from students using the course outline or the unit page.

Use the Unit Page to Hide a Unit

Select the **Hide from students** check box in the status panel.

For more information, see *Controlling Content Visibility*.
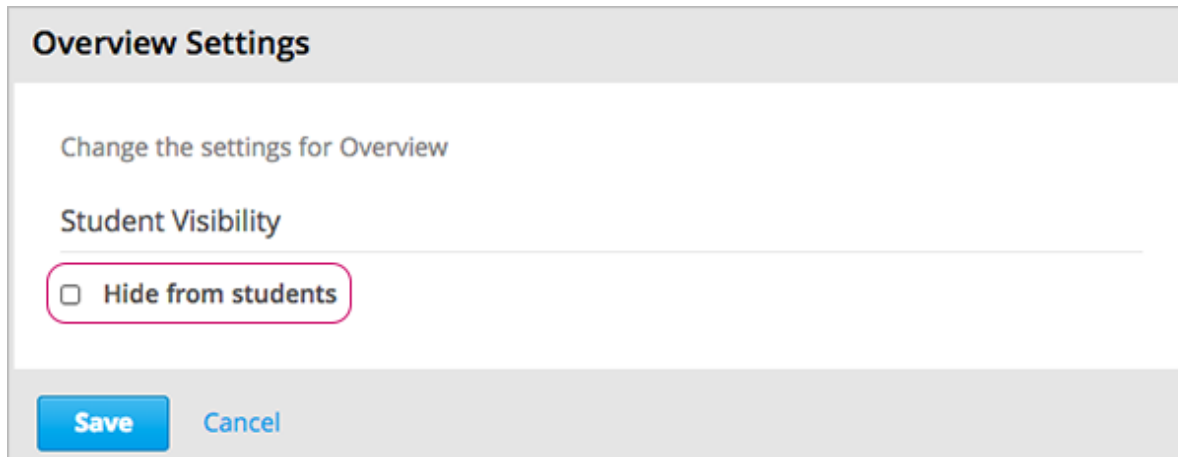
Use the Outline to Hide a Unit

1. Click the Settings icon in the unit box.

The **Settings** dialog box opens.

2. Check **Hide from students**.

3. Click **Save**.

Make a Hidden Unit Visible to Students

Before you make a hidden unit visible to students, be aware that course content will immediately be visible to students, as follows.

- For a hidden unit that previously was published, clearing the check box publishes the current content for the unit. If you made changes to the unit while is was hidden, those draft changes are published.

- When you make a section or subsection that was previously hidden visible to students, draft content in units is *not* published. Changes you made since last publishing units are not made visible to students.

You can make a hidden unit visible to students from the unit page or the course outline. Follow the instructions above and clear the **Hide from students** check box.

You are prompted to confirm that you want to make the unit visible to students.

5.5.15 Delete a Unit

You delete a unit from the course outline.

When you delete a unit, you delete all components within the unit.

> **Warning:** You cannot restore course content after you delete it. To ensure you do not delete content you may need later, you can move any unused content to a section in you

To delete a unit:

1. Click the delete icon in the box for the unit you want to delete.

2. When you receive the confirmation prompt, click **Yes, delete this unit**.

5.6 Developing Course Components

This chapter describes how you develop course components. See:

- *What is a Component*
- *Add a Component*
- *Edit a Component*
- *Duplicate a Component*
- *Delete a Component*
- *Components that Contain Other Components*

For more information about specific component types, see:

- *Creating Course Content*
- *Creating Exercises and Tools*

5.6.1 What is a Component?

A component is the part of a unit that contains your actual course content. A unit can contain one or more components.

A student can view the names of all components in a unit by moving the cursor over each unit in the learning sequence at the top of the page.
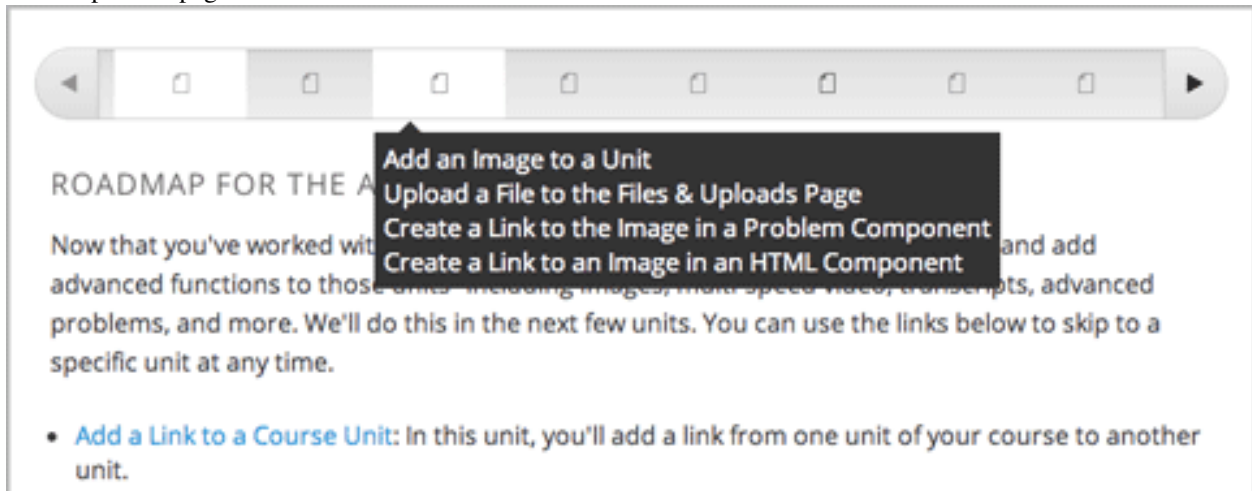
By default, Studio includes four types of components.

- **Discussion components** provide discussion spaces in the body of your course. Students can explore ideas about a lesson with their peers in a discussion space.

- **HTML components** allow you to add text, images, and some types of learning tools to your course. Content in HTML components is formatted as HTML.

- **Problem components** enable you to add many different types of exercises and problems to you course, from simple multiple choice problems to complex circuit schematic exercises.

- **Video components** contain the videos that you want to include in your course.

5.6.2 Add a Component

To add a component to the unit, click the component type that you want under **Add New Component**.
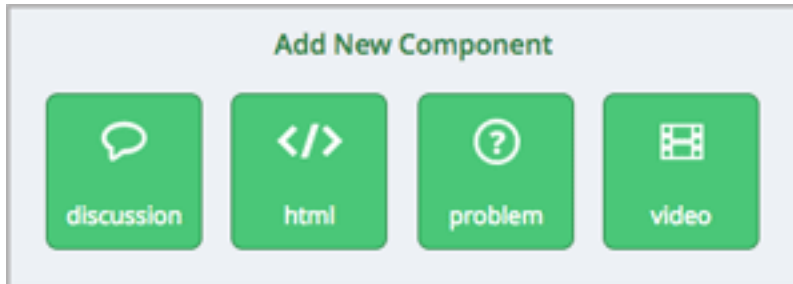
For more information, see the documentation for the specific component type that you want:

- *Working with Discussion Components*
- *Working with HTML Components*
- *Working with Problem Components*
- *Working with Video Components*

After you add a component, it is not visible to students until you *publish the unit*.

5.6.3 Edit a Component

To edit a component, click **Edit**:

Then follow instructions for the type of component you are editing.

After you edit a component, the changes are not visible to students until you *publish the unit*.

Set the Display Name for a Component

Each component has a display name that shows in the component header when you can edit the component. The display name also shows to students when they move the cursor over the unit icon in the learning sequence.

To set the display name for a component:

1. Edit the component.

2. Click **Settings**.

3. Edit the **Display Name** field.

4. Click **Save**.

Different types of components have different fields in the Settings dialog box, but all have the **Display Name** field.

5.6.4 Duplicate a Component

When you duplicate a component, a new copy of that component is added directly beneath the first component. You can then modify the duplicate. In many cases, duplicating a component and editing a copy is a faster way to create new content.

To duplicate a component, click the Duplicate icon in the component header:
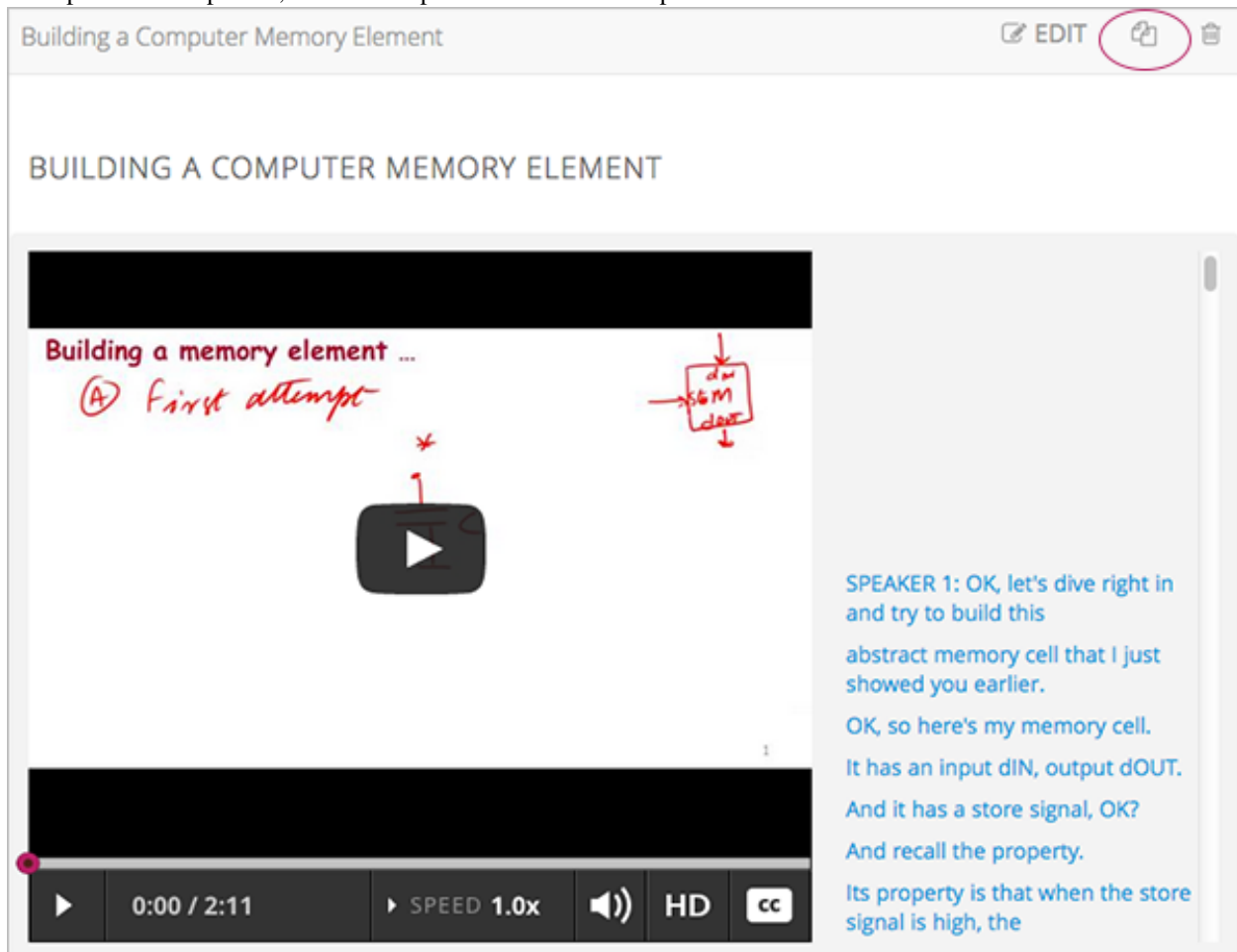
Then follow instructions for the type of component you are editing.

After you duplicate a component, the new component is not visible to students until you *publish the unit*.

Note: You cannot duplicate a content experiment.

5.6.5 Delete a Component

Caution: Be sure you want to delete the component. You can not undo the deletion.

To delete a component:

1. Click the Delete icon in the component header:
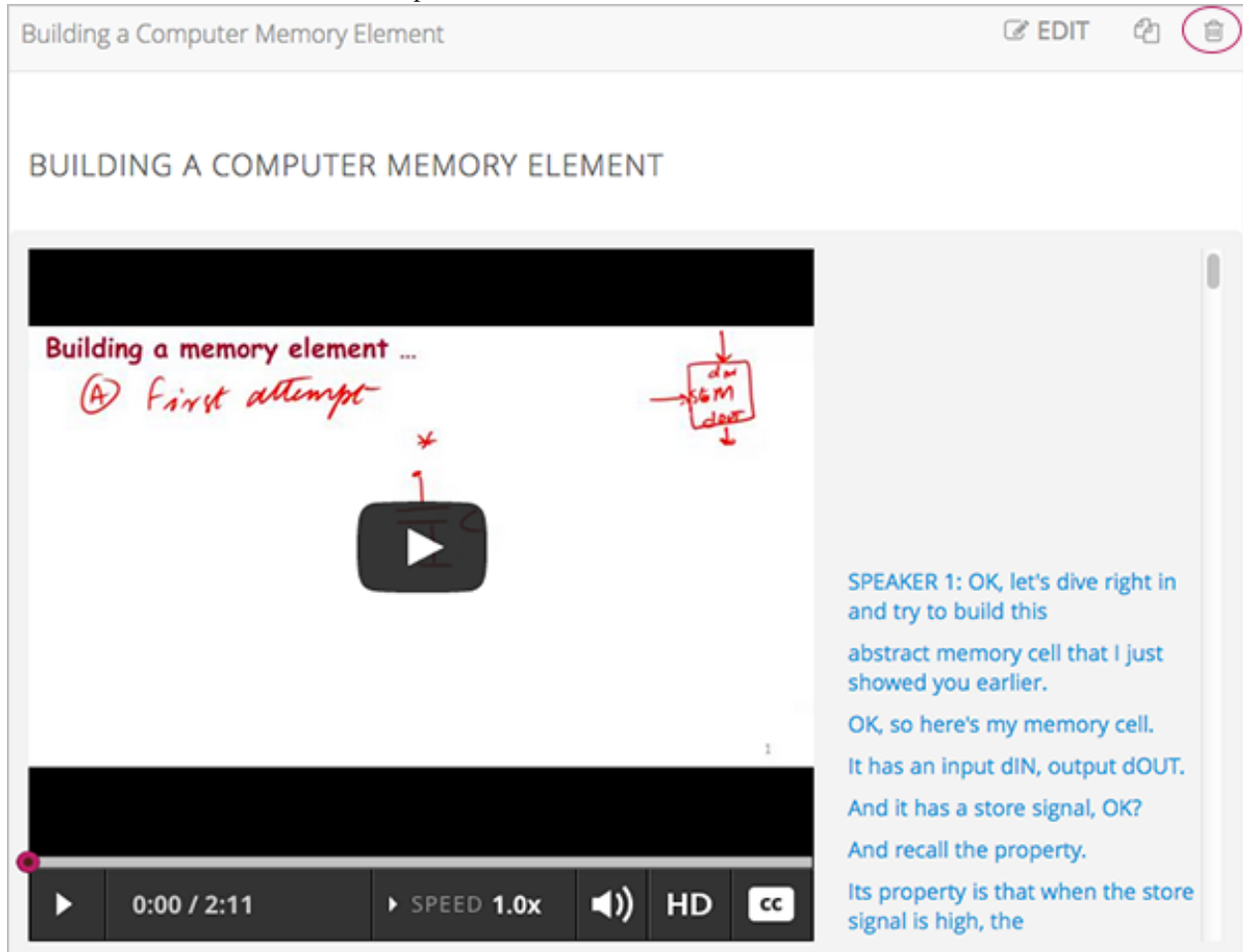
2. When you receive the confirmation prompt, click **Yes, delete this component**.

After you delete a component, the component remians visible to students until you *publish the unit*.

5.6.6 Components that Contain Other Components

For specific use cases, you configure course content so that components contain other components. For example, if you want to include conditional components or content experiments, you have to create components inside components. See *Creating Content Experiments* for more information.

The component that contains other components is referred to as the *parent*; the contained components are referred to as *children*.

In the unit page, a parent component appears with the display name and a **View** link. For example:

Edit a Parent Component

A parent component does not directly contain content. Content such as HTML, videos, or problems are in the child components.

A parent component has a display name. When the unit is private or in draft, click **Edit** in the parent component to change the display name.

Note: Parent components of a specific type, such as content experiments, have additional attributes that you edit.

View Child Components

When you click **View** in the parent component, the parent component page opens, showing all child components. In this example, Child Component A contains an HTML component and a video:

Click the arrow next to a child component name to collapse it and hide the component's contents:
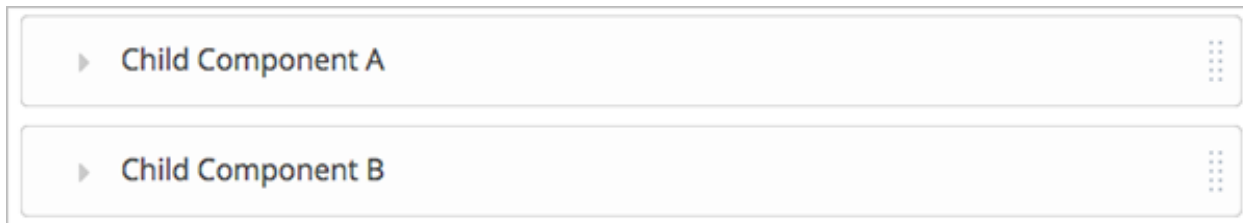
Click the arrow again to expand the component.

See:

- *Edit a Component*
- *Set the Display Name for a Component*
- *Duplicate a Component*
- *Delete a Component*

Add a Child Component

If the containing unit is private or in draft, you can add a child component in its parent component.

To add a child component, open and expand the parent component. Then click the component type that you want under **Add New Component** within the parent component.
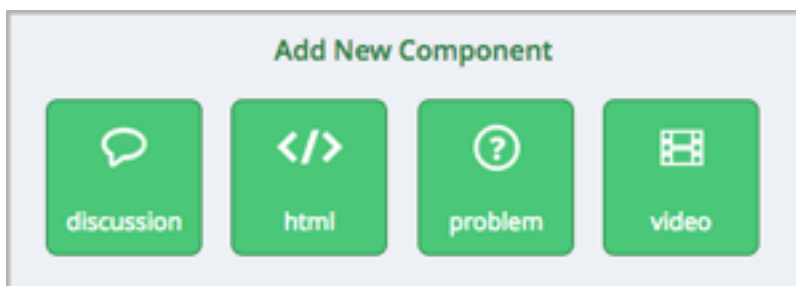
For more information, see the documentation for the specific component type that you want:

- *Working with Discussion Components*
- *Working with HTML Components*
- *Working with Problem Components*
- *Working with Video Components*

XML for Parent and Child Components

You develop parent and child components in XML, then import the XML course into Studio to verify that the structure is as you intended.

For more information about working with your course's XML files, including information about terminology, see the edX XML Tutorial.

The following examples show the XML used to create the unit and components shown in Studio above.

The XML for the unit is:

```
<vertical display_name="Unit 1">
    <html url_name="6a5cf0ea41a54b209e0815147896d1b2"/>
    <vertical url_name="131a499ddaa3474194c1aa2eced34455"/>
</vertical>
```

The `<vertical url_name="131a499ddaa3474194c1aa2eced34455"/>` element above references the parent component file that contains the child components:

```
<vertical display_name="Parent Component">
    <vertical url_name="2758bbc495dd40d59050da15b40bd9a5"/>
    <vertical url_name="c5c8b27c2c5546e784432f3b2b6cf2ea"/>
</vertical>
```

The two verticals referenced by the parent component refer to the child components, which contain the actual content of your course:

```
<vertical display_name="Child Component A">
    <html url_name="4471618afafb45bfb86cbe511973e225"/>
    <video url_name="fbd800d0bdbd4cb69ac70c47c9f699e1"/>
</vertical>
```

```
<vertical display_name="Child Component B">
    <html url_name="dd6ef295fda74a639842e1a49c66b2c7"/>
    <problem url_name="b40ecbe4ed1b4280ae93e2a158edae6f"/>
</vertical>
```

Theoretically, there is no limit to the levels of component nesting you can use in your course.

The Student View of Nested Components

For students, all parent and child components are displayed on the unit page. The following example shows the student view of the unit described above:

1. SEPTEMBER 21

   Words of encouragement! This is a short note that most students will read.

   Anant Agarwal (6.002x Principal Instructor)

   Primary versus Secondary Updates:

   Unfortunately, the internet throws a lot of text at students, and they do not read everything that they are given. However, many students *do* read all that they are given, and so detailed explainations in this section will benefit the most concientious. Any essential information should be extremely quickly summarized in the primary section for skimmers.

   Star Forum Poster

   Students appreciate knowing that the course staff is reading what they post, and one of several ways that you can do this is by acknowledging the star posters in your announcements.

   This is group A.

VIDEO

This is group B.

Note: The visibility of nested components depends on the visibility of the parent unit. The parent unit must be public for students to see nested components. For more information, see *Unit Publishing Status and Visibility to Students*.

5.6.7 Reorganizing Child Components

You can reorganize child components through the same drag and drop process you use for other objects in your course outline. You hover over the element handle on the right side of the screen until the mouse pointer changes to a four-headed arrow. Then, click and drag the element to the location that you want.

Furthermore, when you have multiple levels of nesting, you can drag a child component into a different parent component, if both parents are expanded. For example, you can select the video component that is in Child Component A and drag it into Child Component B. Select the video component, and as you drag it into Child Component B, release the mouse button when a dashed outline of the component you are moving appears in the new location:
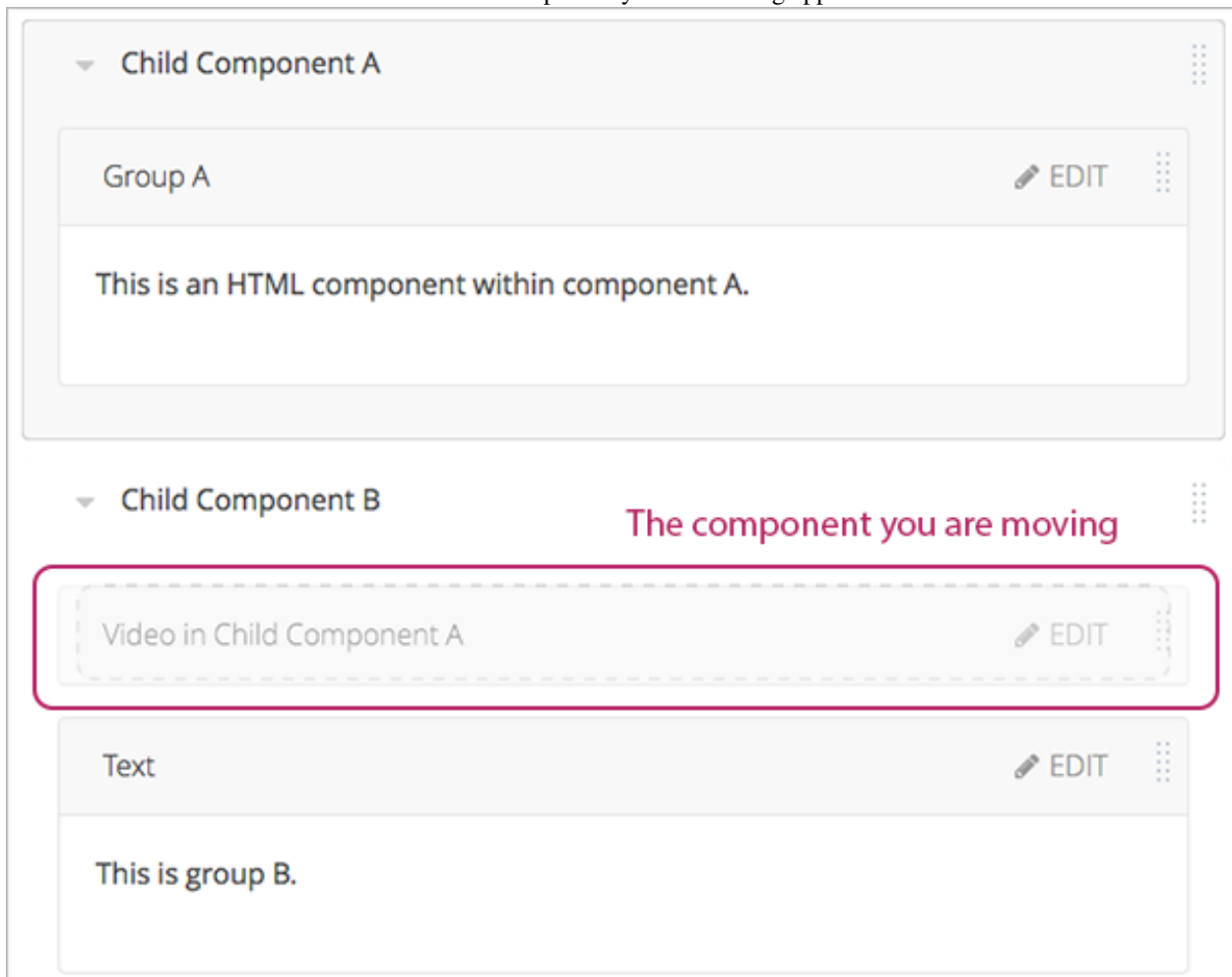
You can also drag a child component outside of a parent, so that the child moves to the same level as the parent.

Note: For content experiments, you cannot drag a child component outside of a test group.

5.7 Controlling Content Visibility

As a member of the course team, you must carefully control which content is visible to students and when.

You control content visibility through these features in Studio:

- *Release Dates*
- *Unit Publishing Status*
- *Content Hidden from Students*
- *Content Groups*

These features work together to control content visibility for students.

5.7.1 Release Dates

You schedule release dates for sections and subsections. By default, a subsection inherits the release date of the section it is in, though you can change it to another date.

By defining release dates, you can ensure that content is available to students as planned without requiring manual intervention at that future time.

Published units are not visible to students until the scheduled release date. When the section and subsection have different release dates, published units are not visible until both dates have passed.

Prior to the release date, content is visible to course team members by *previewing the course* or *viewing the live course as staff*.

See:

- *Set a Section Release Date*
- *Set a Subsection Release Date*

5.7.2 Unit Publishing Status

You publish units to make them visible to students. Students see the last published version of a unit if the section and subsection it is in are released.

Students do not see units that have never been published, and they do not see unpublished changes to units or components within units. Therefore, you can make changes to units in released subsections without disrupting the student experience.

For more information, see *Unit Publishing Status*.

You can publish all changes in a section or subsection at once, or publish changes to individual units. See:

- *Publish all Units in a Section*
- *Publish all Units in a Subsection*
- *Publish a Unit*

5.7.3 Content Hidden from Students

You can hide content from students. Such content is never visible to students, regardless of the release and publishing status.

You might hide a unit from students, for example, when that unit contains an answer to a problem in another unit of that subsection. After the problem's due date, you could make the unit with the answer visible.

You could also hide a unit from students if you wanted to use that unit to provide instructions or guidance meant only for the course team. Only course team members would see that unit in the course.

You can hide content at different levels:

- *Sections*
- *Subsections*
- *Units*

Note: When you make a previously hidden section or subsection visible to learners, some content in the section or subsection may remain hidden. If you have explicitly set a subsection or unit to be hidden from learners, this subsection or unit remains hidden even when you change the visibility of the parent section or subsection. Unpublished units remain unpublished, and changes to published units remain unpublished.

Hiding Graded Content

If you hide a section, subsection, or unit that contains graded problems, grading is not affected. The hidden problems are still counted when the edX platform calculates grades. If a problem was at time visible and learners submitted answers for it, they still receive the credit they earned if you later hide the problem.

5.7.4 Content Groups

If you have cohorts enabled in your course, you can use content groups to designate particular components in your course as visible only to specific groups of learners.

For details, see *Content Groups* and *Creating Cohort-Specific Courseware*.

5.8 Testing Your Course Content

The way your course looks in Studio is different from the way that learners will see and experience it when it is live.

It is recommended that you test your content continually as you build your course, so you can interact with your course from a learner's point of view.

- *Preview Course Content*
- *View Your Live Course*
  - *Staff View*
  - *Student View*
  - *Specific Student View*
- *Open Studio from Your Live Course*

Note: If you use content groups in your course to designate content as visible only to particular students, see *Preview Cohort-Specific Courseware*.

For information about setting up a beta test for your course, see *Beta Testing a Course*.

5.8.1 Preview Course Content

You can preview course content before a course is live or before you publish specific units, to test how content will appear to students when it is released.

When you preview course content, you see the latest course content that is configured in Studio. You see content in units with the publishing status *Draft (Never published)*, *Draft (Unpublished changes)*, or *Visible to Staff Only*.

Note: If you use content groups and have designated components in a unit as visible only to particular groups, the visibility status indicates that some content in the unit is visible only to particular groups. For information about previewing course content if you use content groups to designate content as visible only to particular groups, see *Preview Cohort-Specific Courseware*.

Note: If you use randomized content blocks in your courseware, you cannot preview unpublished units that contain content from randomized content blocks, because the randomized content is not assigned until after the unit is published. For information about viewing the actual content that has been assigned to a particular student from a randomized content block in a live course, see *Specific Student View*.

For example, you *publish a unit* with a video and a discussion.

Students see the same content in the LMS.

You later decide to add a multiple choice problem to the unit, before the discussion. Before you publish this change, you can see how the question will look to students by previewing the unit in the LMS.

When you click **Preview** and select to view the course as a **Student**, you see the unit in the LMS with the multiple choice question. This preview shows how students will experience the unit after you *publish the change*.

In the live course, students continue to see the existing content, without the multiple choice question, until you *publish the change*.

Note: When the unit's state is *Published and Live*, the preview and the live version of the courseware are exactly the same. Selecting either of **View Live** or **Preview** gives you the same view.

5.8.2 View Your Live Course

While you are working in Studio, you can test your live course by viewing it in the LMS as all students, or a particular student, would see it. You can see your course in *Staff View*, *Student View*, or *Specific Student View*. If you are using content groups to designate specific content as visible only to particular content groups, you can see your course as a content group would see it.

You can view the course as a member of these groups.

Role	When You "View As" This Role
Staff	You see all content in the course, including content that is hidden from students.
Student	You see any content that is intended for all students.
Specific Student	You see content that is intended for the student whose email or username you specify.
Student in <Content Group Name>	You see content that is intended for all students, as well as any content specifically set to be visible to this content group.

To switch to your live course and see how it appears to members of the groups in the table above, follow these steps.

1. From the course outline page in Studio, click **View Live** or, from a unit page in Studio, click **View Live Version**.

1. In the live view of the course in the LMS, from the navigation bar at the top of the page, select one of the options in the **View this course as** drop down list, as described in the table above.

The course view refreshes and the content is presented as a member of the selected group would see it.

For details about each view, see *Staff View*, *Student View*, or *Specific Student View*.

Staff View

In the LMS, to view your live course as anyone with the role of **Staff** would see it, use **Staff View**.

- You see all units that are *Published and Live*. For units that are *Draft (Unpublished changes)* or *Visible to Staff Only*, you see the last published version of the unit. You see these units regardless of the release dates of the containing section or subsection.

- You do not see units that are *Draft (Never published)*. To see these units, you must use Preview mode as described in *Preview Course Content*.

- You can access the Instructor Dashboard, which has features and reports that help you *run your course*.

When you view your course in **Staff View**, you can execute tests to make sure that your course works the way you intend. For example, before the release date of a subsection, members of the course team can work through the problems to verify that the correct answer gets a green check for correct, and that any answer other than the correct one gets a red X for incorrect.

Student View

In the LMS, to see the course content in your live course that is intended for all students, use the **Student** view.

Note: If you have enabled your course for cohorts and have designated some content as visible only to certain content groups, you can select a content group from the **View Course As** drop down list to see the content exactly as a student in a cohort associated with that content group will see it. For details, see *Preview Cohort-Specific Courseware*.

To switch to the **Student** view, click **View this course as** and select **Student** from the drop down list.
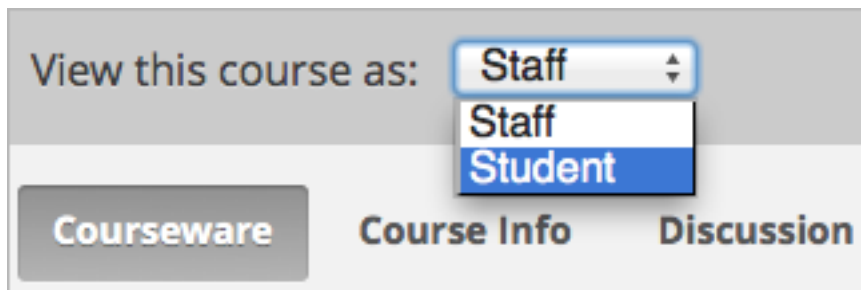
- You do not see sections or subsections that have not yet been released.

- If the section and subsection are released, you see units that are *Published and Live*. For units that are *Draft (Unpublished changes)*, you see the last published version of the unit.

- You do not see units that are *Draft (Never published)* or *Visible to Staff Only*. To see these units, you must switch back to Instructor view or use Preview mode as described in *Preview Course Content*.

- You can access the Instructor Dashboard, which has features and reports that help you run your course.

Specific Student View

In the LMS, the course content in your live course as one particular student would see it, use the **Specific student** view.

Seeing the content in your live course as a specific student sees it is useful in some situations. For example, to adjust a grade or reset the attempts for a problem that was assigned from a randomized content block, you will need to view the courseware as a specific student to see the actual problems that they were assigned. For details about adjusting grades or resetting attempts, see *Adjust Grades*.

To switch to the **Specific student** view, click **View this course as**. Select **Specific student** from the drop down list, and enter the username or the email address of the specific student that you want to view the courseware as.
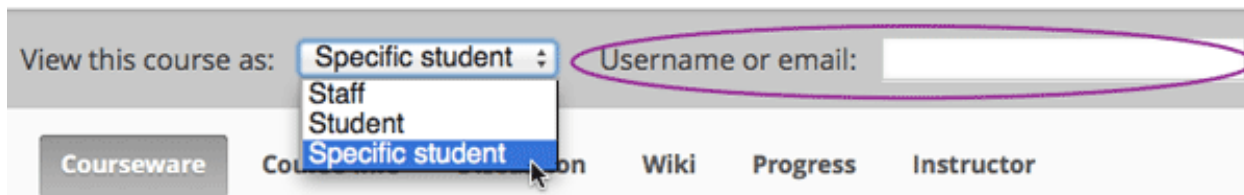
- You do not see sections or subsections that have not yet been released.

- If the section and subsection are released, you see units that are *Published and Live*. For units that are *Draft (Unpublished changes)*, you see the last published version of the unit.

- You do not see units that are *Draft (Never published)* or *Visible to Staff Only*. To see these units, you must switch back to Staff view or use Preview mode as described in *Preview Course Content*.

- You can access the Instructor Dashboard, which has features and reports that help you run your course.

5.8.3 Open Studio from Your Live Course

When you are viewing your course in the LMS as **Staff View**, you can open Studio directly.

- In a unit page, click **View Unit in Studio**.

The unit page opens in Studio.

- In the Instructor Dashboard, click **View Course in Studio** to open the course outline.

For information about the tasks you can complete on the Instructor Dashboard, see *Running Your Course*.

- In the **Course Progress** page, click **View Grading in Studio** to open the Grading page.
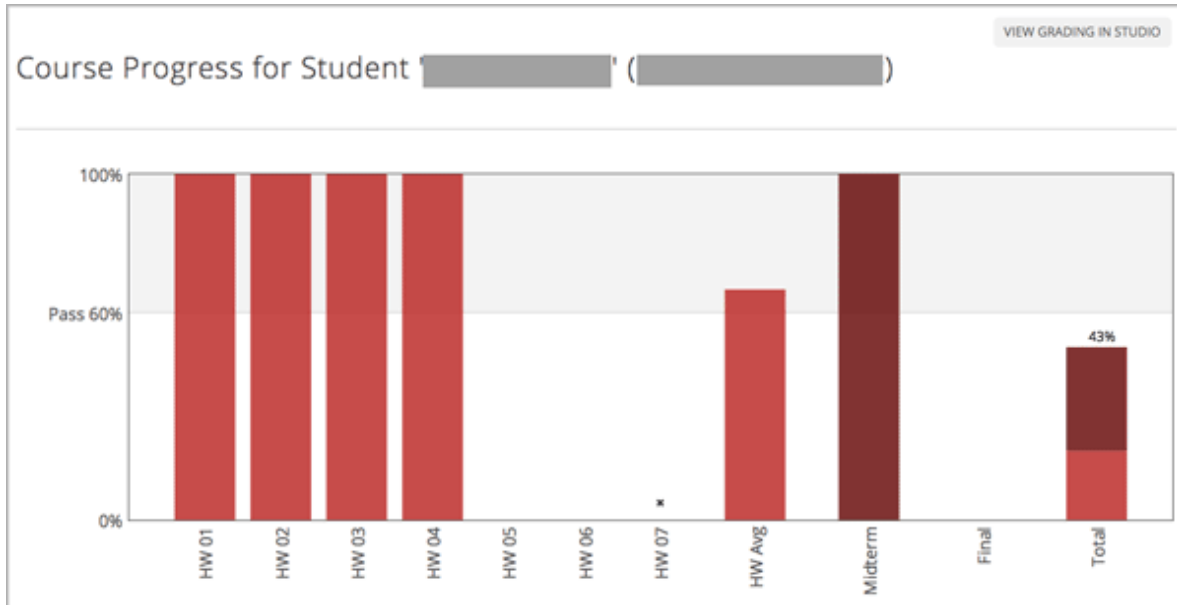
For information about checking a student's progress, see *Review How Grading Is Configured for Your Course*.

Creating Course Content

Use the chapters in this section to understand how to create course content of different types.

For information on creating exercises and tools, see *Creating Exercises and Tools*.

For information on how to develop your course content in the Studio Outline page, see *Developing Your Course*.

6.1 Working with HTML Components

This section describes how to work with HTML components in Studio.

- *HTML Component Overview*
- *Options for Editing HTML Components*
- *The Visual Editor*
- *The Raw HTML Editor*
- *HTML Component Templates*
- *Create an HTML Component*
- *Add a Link in an HTML Component*

6.1.1 HTML Component Overview

HTML, or HyperText Markup Language, is the standard markup language used to create web pages. Web browsers present HTML code in a more readable format.

When students see text and images in your course, they are seeing HTML code that is formatted and presented by their browsers. For more information about HTML, see Wikipedia.

HTML Components

HTML components are the basic building blocks of your course content. You use HTML components to add and format text, links, images, and more. You can choose to create HTML components directly in HTML code, or in a visual editor that hides the HTML code details, as described below.

Note: Review *Developing Your Course* and *Use Best Practices for HTML Markup* before you start working with HTML components.

To add an instant hangout to an HTML component, see *Google Instant Hangout Tool*.

6.1.2 Options for Editing HTML Components

You can work with HTML in two ways.

- *The Visual Editor*

  With the visual editor you can create, edit, and format content in a word processing-like interface, without using HTML code directly. With the visual editor, you can more easily format your content, and add links and images. The visual editor provides access to HTML code so you can make small changes to formatting, if required. However, the HTML view in the visual editor does not provide the detailed control you can get with the raw HTML editor, and does not support custom formatting or scripts.

- *The Raw HTML Editor*

  With the raw HTML Editor, you work directly with HTML code. If you need to use custom formatting or scripts in your content, you should use the raw HTML editor.

Set the Editor for an HTML Component

You set the editor for an HTML component in the **Settings** tab.

Select **Visual** or **Raw**. When you change the editor, you must select **Save** and re-open the component to begin using the new editor.

> **Warning:** If you work with content in the raw HTML editor, then switch to the visual editor, you may lose custom HTML that you created. Therefore, it is recommended that you start by using the visual editor, then switch to the raw HTML editor when you need to create custom HTML.

6.1.3 The Visual Editor

The visual editor provides a "what you see is what you get" (WYSIWYG) interface that allows you to format text by selecting the formatting buttons at the top of the editor.

Note: The visual editor is not available for *course handouts*.

The following image shows call-outs for the editing options and is followed by descriptions.
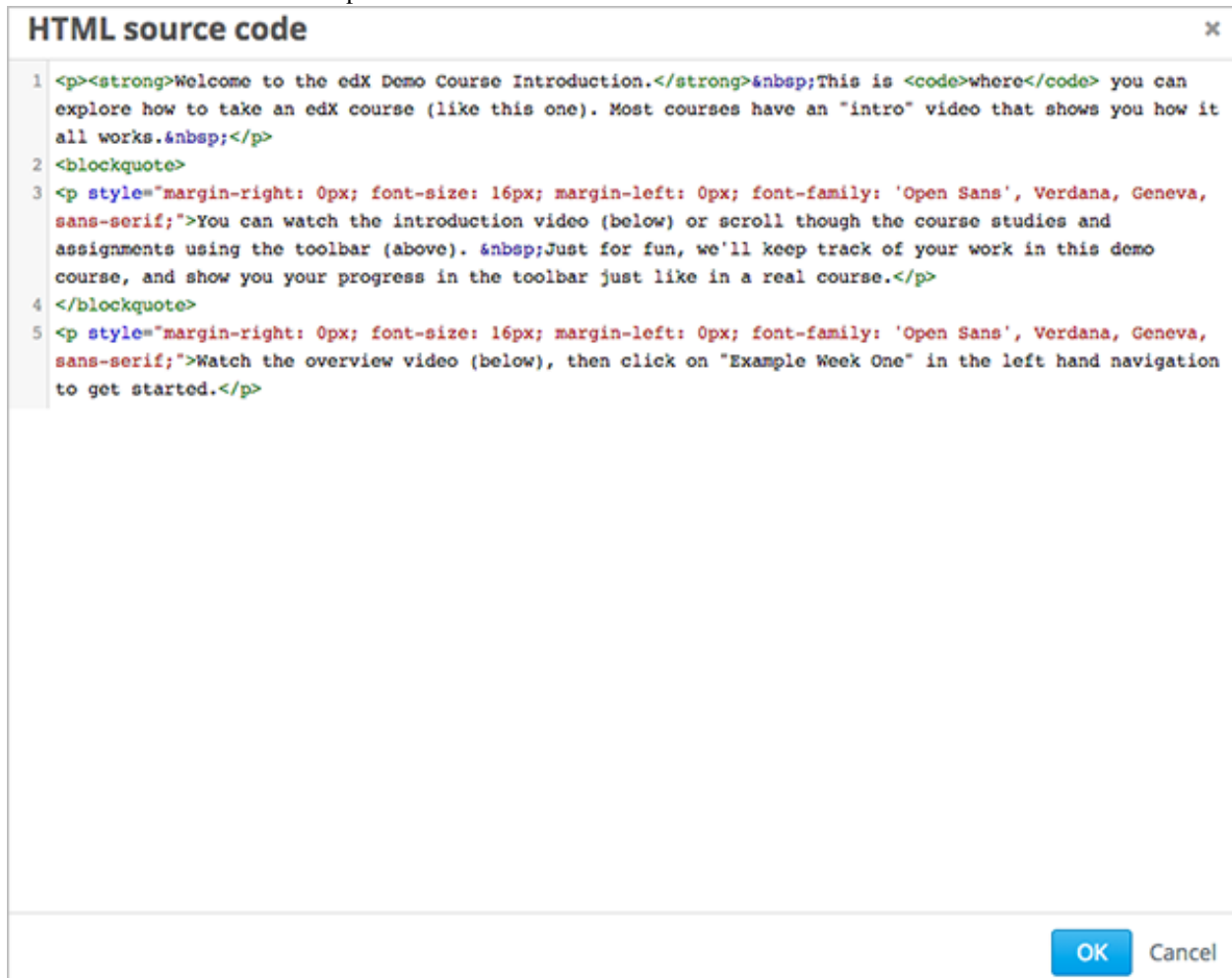
1. Choose a formatting style for the selected paragraph, such as heading 1, heading 2, or paragraph.

2. Choose a font family for selected text, such as Arial, Courier New, or Times New Roman.

3. Format selected text in bold. The editor inserts `<strong>` tags around the selected text.

4. Format selected text in italics. The editor inserts `<em>` tags around the selected text.

5. Underline the selected text. The editor encloses the selected text in the tag `<span style="text-decoration: underline;">`.

6. Apply a color to the selected text. The editor encloses the selected text in the tag `<span style="color: color-hex-code;">`.

7. Format selected text as a code block. The editor inserts `<code>` tags around the selected text, which is then displayed in a monospace font.

8. Create a bulleted list. The editor inserts `<ul>` tags around the selected text, and encloses each paragraph in `<li>` tags.

9. Create a numbered list. The editor inserts `<ol>` tags around the selected text, and encloses each paragraph in `<li>` tags.

10. Decrease and increased the indentation of the selected paragraph.

11. Format the selected paragraph as a blockquote. The editor inserts `<blockquote>` tags around the selected text, which is then displayed as a separate paragraph in a monospace font.

12. Create a link from the selected text. See *Add a Link in an HTML Component*.

13. Delete the current link.

14. Insert an image at the cursor. See *Add an Image to an HTML Component*.

15. Work with HTML source code, described below.

Work with HTML code in the Visual editor

To work with HTML source code for the content you create in the visual editor, select **HTML** in the editor toolbar. The HTML source code editor opens.

Edit the HTML code as needed.

You should not add custom styles or scripts in the HTML code view in the visual editor. Use the raw HTML editor instead.

Select **OK** to close the source code editor and apply your changes in the visual editor. The visual editor then attempts to ensure the underlying HTML code is valid; for example, if you do not close a paragraph tag, the editor adds a closing tag for you.

> **Warning:** Selecting **OK** in the source code editor does not save your changes to the HTML component. You return to the component editor, where your changes are applied. You must then also select **Save** to save your changes and close the component. If you select **Cancel**, the changes you made in the HTML source code are lost.

6.1.4 The Raw HTML Editor

When you select the raw editor for the HTML component, you edit your content in a text editor.
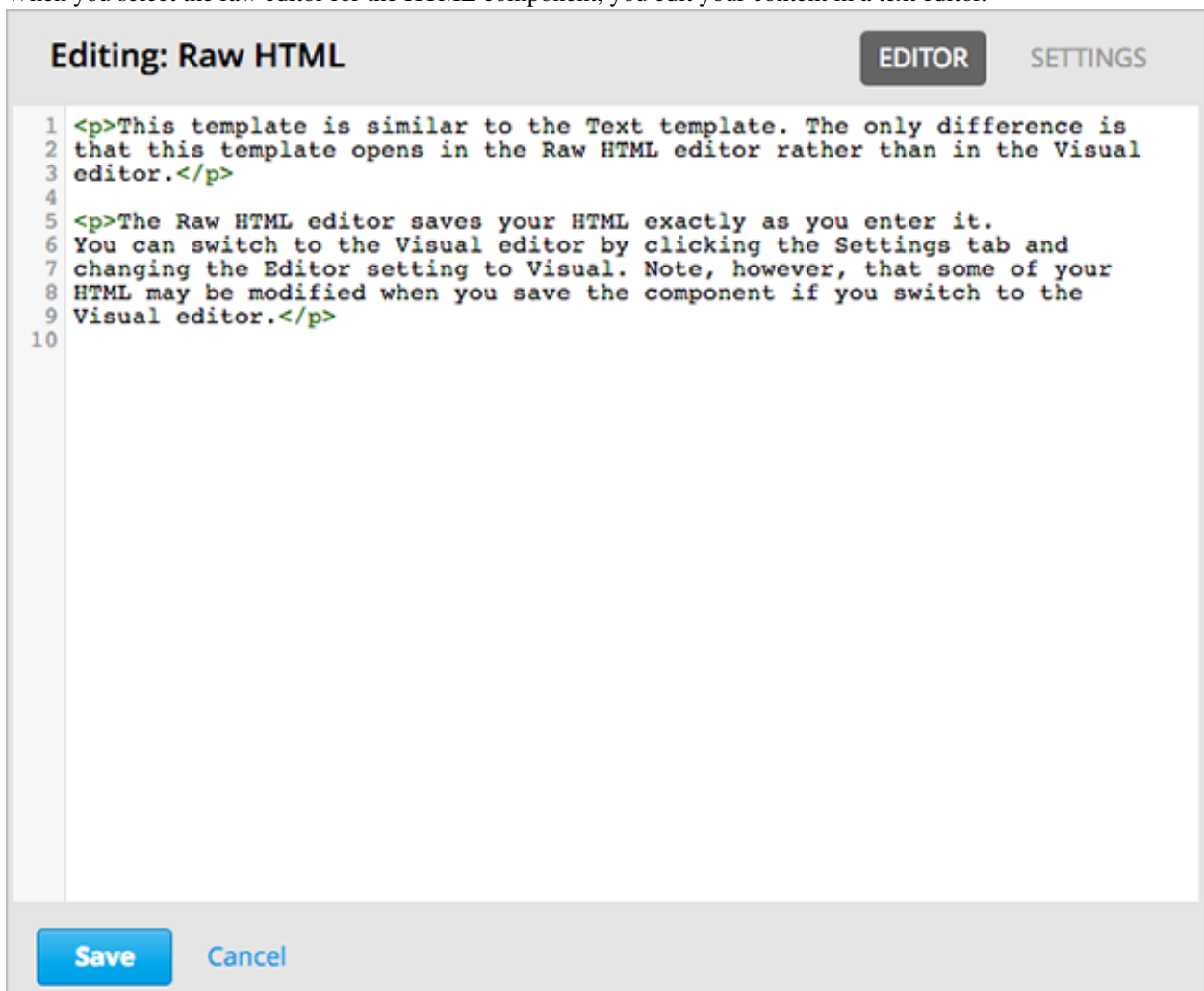
You must enter valid HTML. The raw HTML editor does not validate your HTML code. Therefore you should thoroughly test the HTML content in your course.

6.1.5 HTML Component Templates

When you create a new HTML component, you select from a list of templates.
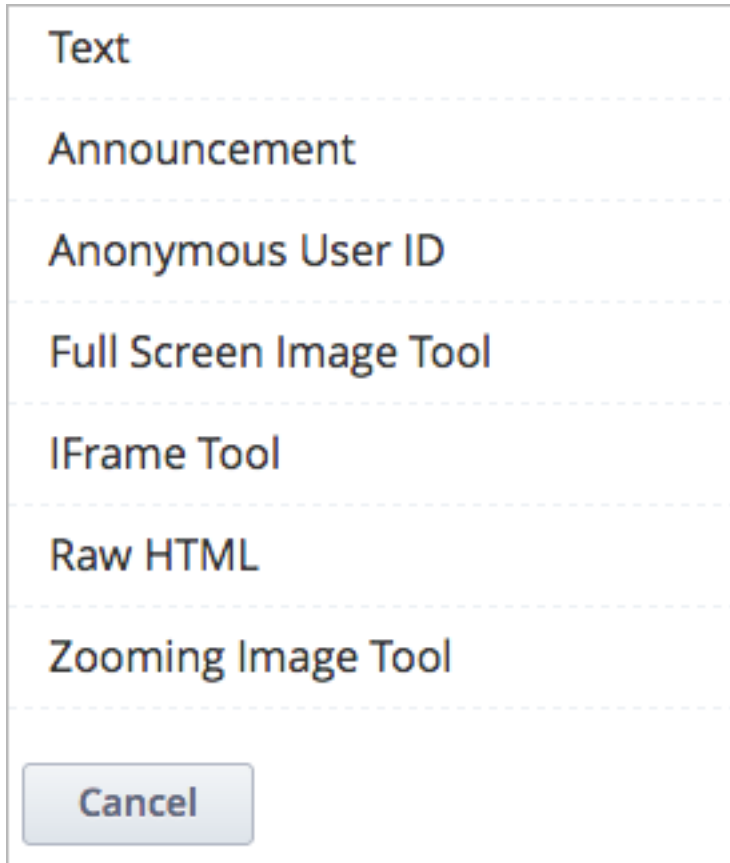
The raw HTML template is set to use the raw HTML editor. All other templates use the visual editor.

For any HTML component, you can change the editor, regardless of the template used to create the component. See *Set the Editor for an HTML Component*.

6.1.6 Create an HTML Component

1. Under **Add New Component**, select **HTML**.
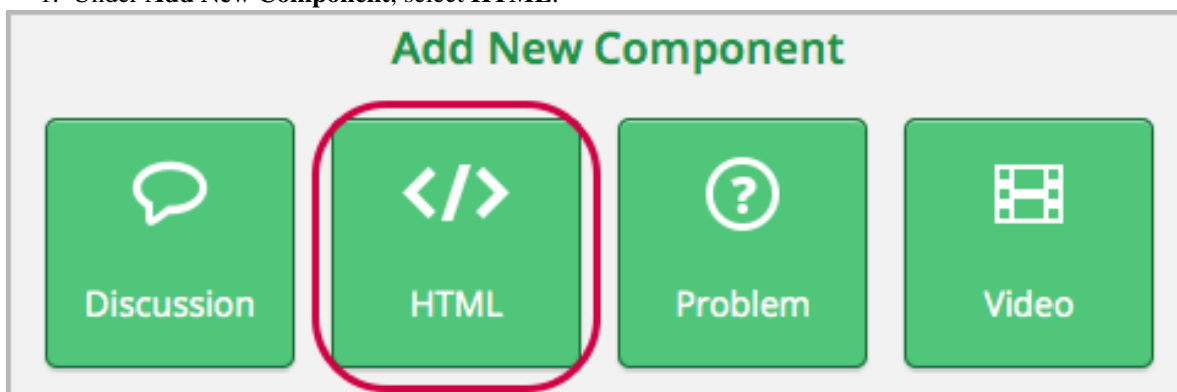
2. Select the template.

The rest of these instructions assume that you selected **Text**, which creates an empty HTML component with the visual editor selected.

An empty HTML component appears at the bottom of the unit.

Text	☑ EDIT ⧉ 🗑
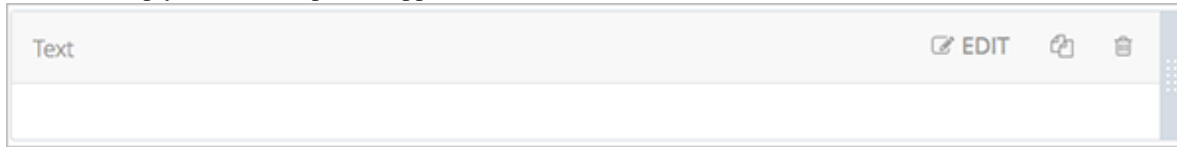
3. In the component, select **Edit**.

   The HTML component opens in the visual editor.
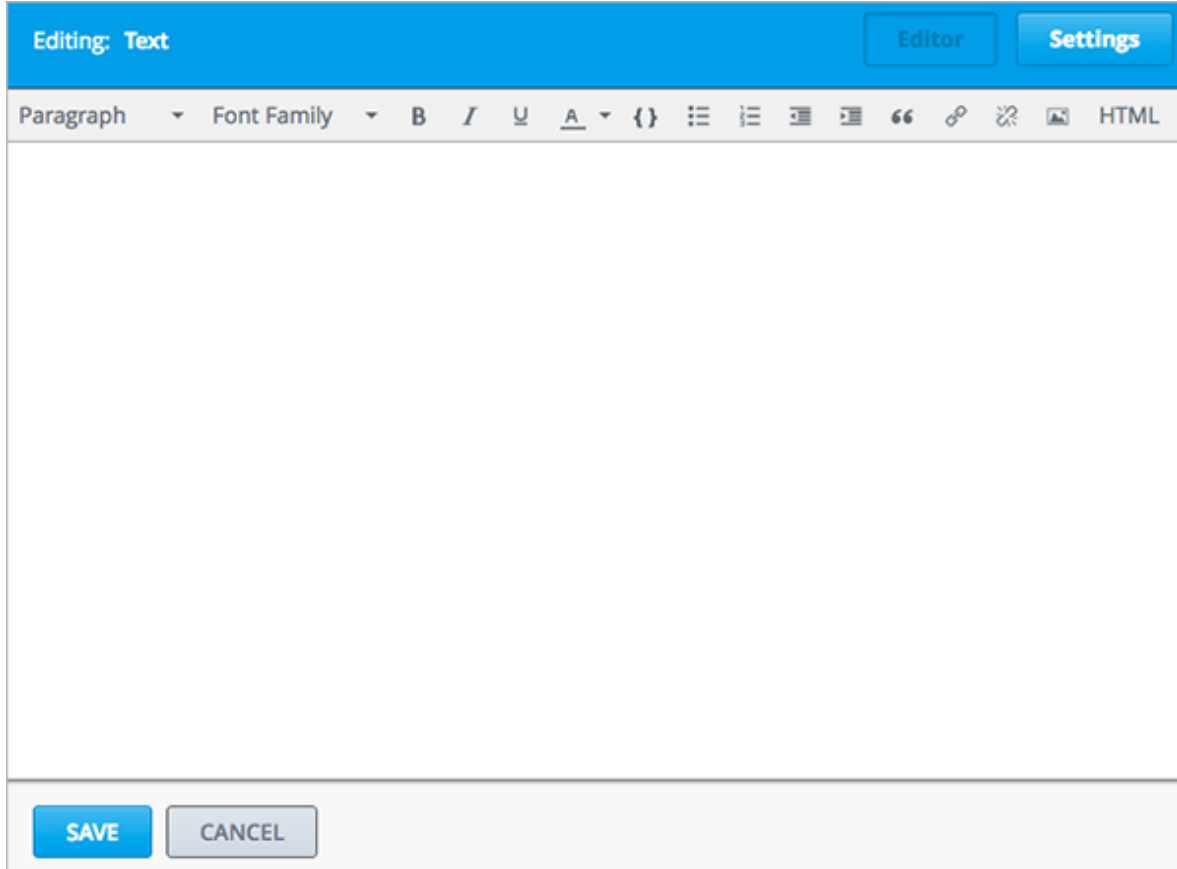
4. Enter and format your content. You can *Work with HTML code in the Visual editor* if needed.

5. Enter a display name (the name that you want learners to see). To do this, select **Settings** in the upper right corner of the component editor, and then enter text in the **Display Name** field.

   To return to the text editor, select **Editor** in the upper right corner.
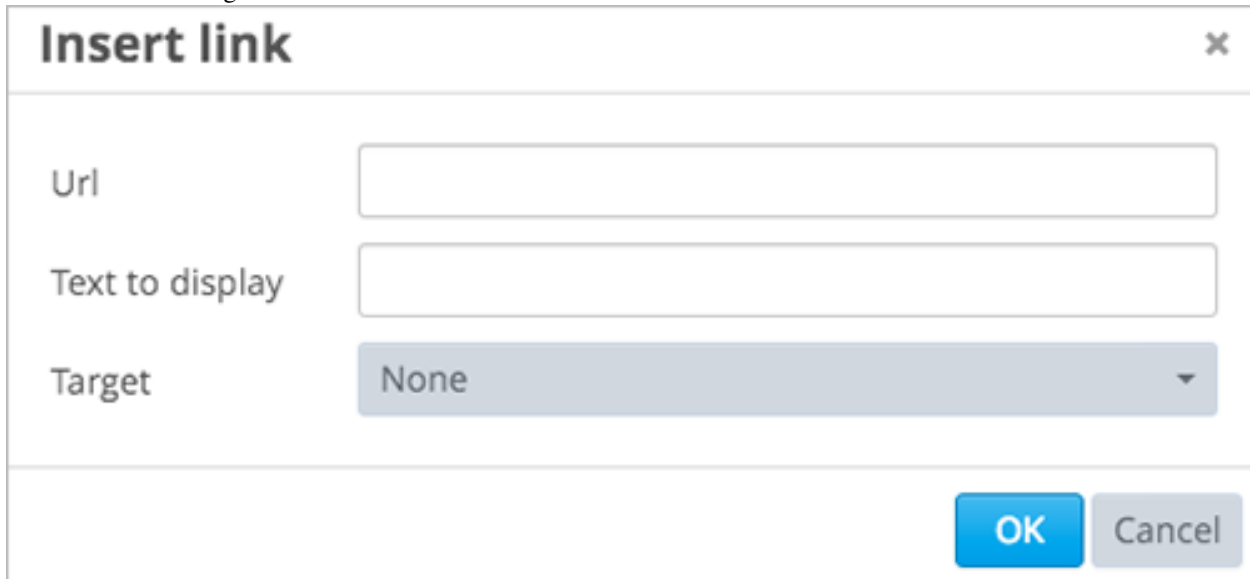
6. Select **Save** to save the HTML component.

When using the visual editor, you can also perform the following tasks.

- *Add a Link in an HTML Component*
- *Add an Image to an HTML Component*
- *Import LaTeX Code into an HTML Component*

6.1.7 Add a Link in an HTML Component

When using the visual editor, to add a link to a website, course unit, or file in an HTML component, you work with the **Insert link** dialog box.

For more information, see the following tasks.

- *Add a Link to a Website*
- *Add a Link to a Course Unit*
- *Add a Link to a File*

Add a Link to a Website

1. Select the text that you want to use as the link text.
2. Select the link icon in the toolbar.
3. In the **Insert link** dialog box, enter the URL of the website that is the destination for your link.

4. If you want the link to open in a new window, select the dropdown arrow next to the **Target** field, and then select **New Window**. If not, you can leave the default value.

5. Select **OK**.

6. Save the HTML component.

7. To test the link, select **View Live Version** or **Preview**. When the unit opens in the LMS, select the linked text and verify that the correct website opens.

Add a Link to a Course Unit

Note: To link to another component, the unit of that destination component must be published for the link to work.

---

1. Obtain the unit identifier of the unit you want to link to. To do this, open the unit page in Studio, and copy the unit ID from the **Unit Identifier** field under **Unit Location** in the right pane.

2. Open the HTML component where you want to add the link.

3. Select the text that you want to make into the link.

4. Select the link icon in the toolbar.

5. In the **Insert link** dialog box, enter the following in the **URL** field.

   ```
   /jump_to_id/<unit identifier>
   ```

   Make sure to replace <unit identifier> (including the brackets) with the unit identifier that you copied in step 1, and make sure to include both forward slashes (/).

> **Caution:** Ensure you use `/jump_to_id/<unit identifier>` as the URL value. Do not use the URL of the unit that you see in the browser address bar. If you do not use `/jump_to_id/<unit identifier>`, the link will be broken if you export then import the course.

6. If you want the link to open in a new window, select the dropdown arrow next to the **Target** field, and then select **New Window**. If not, you can leave the default value.

7. Select **Insert**.

8. Save the HTML component and test the link.

Add a Link to a File

You can add a link in an HTML component to any file that is uploaded for the course. For more information about uploading files, see *Adding Files to a Course*.

> **Tip:** When adding links to files, open the HTML component and the **Files & Uploads** page in separate browser windows. You can then more quickly copy and paste file URLs.

1. On the **Files & Uploads** page, copy the **Studio** URL of the file.

> **Note:** You must use the **Studio** URL to link to the file, not the **Web** URL.

2. In the HTML component where you want to add the link, select the text that you want to make into the link.

3. Select the link icon in the toolbar.

4. In the **Insert link** dialog box, enter the Studio URL for the file in the **URL** field.

   `/static/{FileName}.{type}`

   Make sure to include both forward slashes (/).

5. If you want the link to open in a new window, select the dropdown arrow next to the **Target** field, and then select **New Window**. If not, you can leave the default value.

6. Select **Insert**.

7. Save the HTML component and test the link.

Add an Image to an HTML Component

When you use the visual editor, you can add any image that you have uploaded for the course to an HTML component. For more information about uploading images, see *Adding Files to a Course*.

Review *Use Best Practices for Describing Images* before you add images to HTML components.

Note: Ensure that you obtain copyright permissions for images you use in your course, and that you cite sources appropriately.

To add an image, you need the URL of the image that you uploaded to the course. You then create a link to the image in the HTML component.

Tip: When adding images, open the HTML component and the **Files & Uploads** page in separate browser windows. You can then more quickly copy and paste image URLs.

---

1. On the **Files & Uploads** page, copy the **Studio** URL of the image that you want. For an example illustration, see *Add a Link to a File*.

   Note: You must use the **Studio** URL to add the image, not the **Web** URL.

   ---

2. In the HTML component where you want to add the link, select the image icon in the toolbar.

3. In the **Insert image** dialog box, enter the Studio URL for the file in the **URL** field.

   `/static/{FileName}.{type}`

   Make sure to include both forward slashes (/).

---

4. Enter alternative text in the **Image description** field. This text becomes the value of the `alt` attribute in HTML and is required for your course to be fully accessible. See *Use Best Practices for Describing Images* for more information.

5. As needed, customize the image dimensions. Keep **Constrain proportions** selected to ensure the image keeps the same width and height proportions.

   With **Constrain proportions** selected, you only change one dimension. When you tab out of the field, the other dimension changes to a value that maintains the same image proportions.

6. To change the spacing and border of the image, select the **Advanced** tab.

7. Enter the **Vertical space**, **Horizontal space**, and **Border** as needed. The values you enter are automatically added to the **Style** field.

8. Select **OK** to insert the image in the HTML component.

9. Save the HTML component and test the image.

Import LaTeX Code into an HTML Component

You can import LaTeX code into an HTML component. You might do this, for example, if you want to create "beautiful math" such as the following.

Example of E-text in LaTeX

You can write complex equations such as the following in LaTeX.

$$x = \frac{-b \pm \sqrt{b^2 - 4 * a * c}}{2a}$$

$$L' = L\sqrt{1 - \frac{v^2}{c^2}}$$

$$\lim_{x \to 0} \frac{e^x - 1}{2x} \left[\frac{\frac{0}{0}}{H}\right] \lim_{x \to 0} \frac{e^x}{2} = \frac{1}{2}$$

> **Warning:** The LaTeX processor that Studio uses to convert LaTeX code to XML is a third- party tool. We recommend that you use this feature with caution. If you do use it, make sure to work with your Program Manager.

Enable the LaTeX Processor

The LaTeX processor is not enabled by default. To enable it, you have to change the advanced settings in your course.

1. In Studio, select **Settings**, and then select **Advanced Settings**.

2. In the field for the **Enable LaTeX Compiler** policy key, change **false** to **true**.

3. At the bottom of the page, select **Save Changes**.

Add an HTML Component that Contains LaTeX Code

When the LaTeX processor is enabled, you can create an HTML component that contains LaTeX code.

1. In the unit where you want to create the component, select **html** under **Add New Component**, and then select **E-text Written in LaTeX**. The new component is added to the unit.

2. Select **Edit** to open the new component. The component editor opens.

3. In the component editor, select **Launch Latex Source Compiler**. The LaTeX editor opens.

```
HIGH LEVEL SOURCE EDITING

1  \subsection{Example of E-text in LaTeX}
2
3  You can write complex equations such as the following in LaTeX.
4
5  \begin{equation}
6          x = \frac{-b\pm\sqrt{b^2-4*a*c}}{2a}
7  \end{equation}
8
9  \begin{equation}
10    L' = {L}{\sqrt{1-\frac{v^2}{c^2}}}
11  \end{equation}
12
13
14  \[
15   \lim_{x\to 0}{\frac{e^x-1}{2x}}
16   \overset{\left[\frac{0}{0}\right]}{\underset{\mathrm{H}}{=}}
17   \lim_{x\to 0}{\frac{e^x}{2}}={\frac{1}{2}}
18  \]
19
```

Save & Compile to edX XML   Save   Refresh   Upload

4. Write LaTeX code as needed. You can also upload a LaTeX file into the editor from your computer by selecting **Upload** in the bottom right corner.

5. When you have written or uploaded the LaTeX code you need, select **Save & Compile to edX XML** in the lower-left corner.

   The component editor closes. You can see the way your LaTeX content looks.

E-text Written in LaT...   ✎ EDIT   ⧉   🗑

                                                                upload

Example of E-text in LaTeX

It is very convenient to write complex equations in LaTeX.

$$ x = \frac{-b \pm \sqrt{b^2 - 4*a*c}}{2a} $$

Seize the moment.

6. On the unit page, select **Preview** to verify that your content looks the way you want it to look in the LMS.

   If you see errors, go back to the unit page. Select **Edit** to open the component again, and then select **Launch Latex Source Compiler** in the lower left corner of the component editor to edit the LaTeX code.

6.2 Working with Video Components

This section describes how to work with videos for your course.

- *Overview*
- *Step 1. Create the Video*
- *Step 2. Create or Obtain a Video Transcript*
- *Step 3. Post the Video Online*
- *Step 4. Create a Video Component*
- *Including Optional Collateral*

6.2.1 Overview

You can create videos and add them to a course to supplement active learning components, such as discussions and problems. Videos can be effective for a number of purposes, such as presenting motivating material, showing experiments, and reducing cognitive load for complex content.

When to use a Video

Before creating video content, figure out whether video is the best medium by asking the following questions.

- Should the content be conveyed through text?
- Through an interactive demonstration?
- By having learners work through a problem?

Video Length

Keep videos as short as possible.

Learners are much less likely to finish watching a video if it is more than 5-10 minutes long.

Video Accessibility

Be sure to review *Create Accessible Media* before you create videos for your course.

Allowing Learners to Download Videos

To help course teams protect video assets, the edX video player hides video URLs by default. This functionality is in effect for all video files, including YouTube videos and videos that are hosted in other locations.

You can allow learners to download videos by selecting the **Video Download Allowed** option for your video components.

For more information about posting videos to hosting sites other than YouTube, see *Step 3. Post the Video Online*.

For more information about options that you can set when you create a video component, see *Setting Advanced Options* under *Step 4. Create a Video Component*.

6.2.2 Step 1. Create the Video

Your videos can contain whatever content you want to include in the course. The Creating Videos section of edX101 Overview of Creating an edX Course has some helpful pointers for creating good video content.

When you create videos, follow Richard Mayer's 12 Principles. The principles in this document are based on extensive experimental research of student learning.

Recommended Compression Specifications

EdX recommends the following video compression specifications. These specifications are recommended but not required.

Output	Publish to YouTube	Publish downloadable file to AWS S3
Codec	H.264 .mp4	H.264 .mp4
Resolution & Frame Rate (see note)	1920x1080, progressive, 29.97 fps	1280x720, progressive, 29.97 fps
Aspect	1.0	1.0
Bit Rate	VBR, 2 pass	VBR, 2 pass
Target VBR	5 mbps	1 mbps
Max VBR	7.5 mbps	1.5 mbps
Audio	AAC 44.1 / 192 kbps	AAC 44.1 / 192 kbps

Note: Typically you export at the same frame rate that was used when you created the media file. For example, if you create the file in a country that uses the PAL system, you export at 25 fps instead of the NTSC standard of 29.97 fps.

Supported Video Formats

The edX video player supports videos in .mp4, .webm, .mpeg, and .ogg format. However, to help make sure all standard browsers can play your video, edX strongly recommends that you use the **.mp4 format**.

6.2.3 Step 2. Create or Obtain a Video Transcript

Transcripts are required for your videos. Transcripts are required for deaf or hard of hearing learners to understand audio content, and helpful for learners who speak other languages. You can allow learners to download transcripts so that they can read them offline. You associate a transcript with a video when you create the video component.

Timed transcripts in the SubRip Text (.srt) format are strongly recommended. A transcript in the .srt format appears next to its associated video and automatically scrolls as the video plays. A learner can select a word in the transcript to jump to the point in the video where that word is spoken.

To create or obtain a transcript in .srt format, you can work with a company that provides captioning services. EdX works with 3Play Media. YouTube also provides captioning services.

When you upload an .srt file, a .txt file is created automatically. You can allow learners to download these transcript files. If you allow your learners to download transcripts, the video player includes a **Download transcript** option. Learners can then select either **SubRip (.srt) file** or **Text (.txt) file** to download the .srt or .txt transcript.
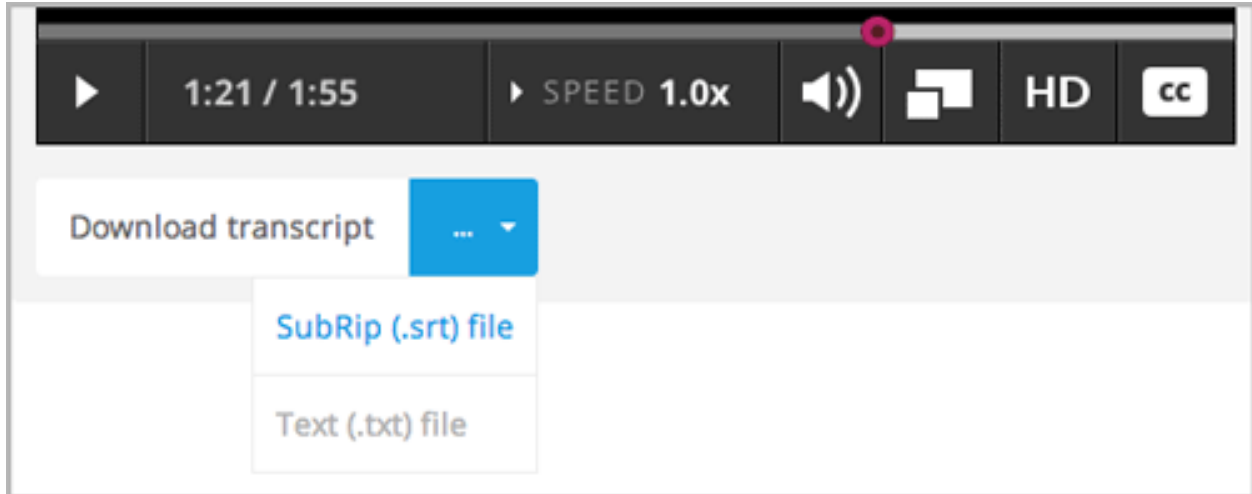
Naming SubRip Text Files

To prevent errors when you upload your video transcripts, edX recommends the following conventions for naming your transcript files.

- Each transcript file should have a unique identifying name. The name should be unique not only across the transcript files for your videos, but across all of your course uploads.

- File names that include special characters, such as ç, å, or ó, cause the upload option to result in an error. Before you upload a transcript, change the file name to remove the special characters.

- Make sure that the file type, `.srt`, is in lower case.

- Other than to separate the identifying name from the `.srt` file type, file names should not include periods.

Providing Transcripts in Other Formats

You can provide transcripts in formats other than the .srt format, such as .pdf, and you can provide additional transcript files in different languages. For more information about these options, see *Add a Supplemental Downloadable Transcript*.

Note: Historically, some courses used .sjson files for video transcripts. Use of .sjson files is no longer recommended; however, if transcripts in your course use this format, see *Steps for .sjson Files*.

6.2.4 Step 3. Post the Video Online

All course videos should be posted to YouTube. By default, the edX video player accesses your YouTube videos.

Because YouTube is not available in all locations, however, edX recommends that you also post copies of your videos on a third-party hosting site such as Amazon S3. When a learner views a video in your course, if YouTube is not available in that learner's location or if the YouTube video does not play, the video on the backup site starts playing automatically. You can also allow the learners to download the video from the backup site.

After you post your video online, make sure you have the URL for that copy of the video. If you post copies of your video in more than one place, make sure you have the URL for each video location.

YouTube

After you create your video, upload the video to YouTube.

> **Note:** YouTube only hosts videos of up to 15 minutes. If you create a 0.75-speed option, you must make sure that your 1.0-speed video segments are only 11.25 minutes long so that YouTube can host all speeds. YouTube offers paid accounts that relax this restriction.

Other Sites

You can use any video backup site that you want. However, keep in mind that the site where you post the videos might need to handle high traffic volume.

> **Note:** The URL for the video that you post on a third-party site must end in .mp4, .webm, .mpeg, or .ogg. (To help make sure all standard browsers can play your video, edX **strongly** recommends that you use .mp4 format.) EdX cannot support videos that you post on sites such as Vimeo.

If you (or your beta testers or learners) encounter an error when you view a course video, it might be the result of one of these browser-related problems.

- Verify that the viewer's browser is up to date. For example, some older versions of the Mozilla Firefox browser did not play .mp4 video files, and some older versions of the Firefox browser did not play .webm video files. These problems do not occur in more recent versions of these browsers.

  For more information, see Media formats supported by the HTML audio and video elements.

- Verify that file metadata, particularly the MIME type, is correctly set on the host site. Internet Explorer 10 browsers do not play videos if the MIME type is not set. For example, make sure that the HTTP header `Content-Type` is set to video/mp4 for an .mp4 file, or to video/webm for a .webm file.

  As an example of how you might set metadata on a video backup site, the *Console User Guide* for the Amazon Simple Storage Service provides this information about editing object metadata.

6.2.5 Step 4. Create a Video Component

To add a video and its transcript to your course, follow these steps.

1. Under **Add New Component**, select **Video**.

2. When the new video component appears, select **Edit**. The video editor opens to the **Basic** page.

You replace the default values with your own.

3. In the **Component Display Name** field, enter an identifying name for this video. This name appears as a heading above the video and as a tooltip in the learning sequence at the top of the **Courseware** page. It also identifies the video for you in Insights.

4. In the **Default Video URL** field, enter the URL of the video. Example URLs follow.

```
http://youtu.be/OEoXaMPEzfM
http://www.youtube.com/watch?v=OEoXaMPEzfM
https://s3.amazonaws.com/edx-course-videos/edx-edx101/EDXSPCPJSP13-G030300.mp4
https://s3.amazonaws.com/edx-videos/edx101/video4.webm
```

Note: To be sure that all learners can access a video, you can create multiple versions that use different encodings or hosting services. After you post different versions on the Internet, you add each URL below the default video URL. **These URLs cannot be YouTube URLs**. To add a URL for another version, select **Add URLs for additional versions**. The first listed video that is compatible with the learner's computer plays.

5. Next to **Default Timed Transcript**, select an option.

   • If edX already has a transcript for this video, Studio automatically finds the transcript and associates the transcript with the video. This situation can occur when you reuse a video from an existing course.

     If you want to modify the transcript, select **Download Transcript for Editing**. You can then make your changes and upload the new file by selecting **Upload New Transcript**.

- If edX does not have a transcript for the video, but YouTube has a transcript, Studio automatically finds the YouTube transcript and asks if you want to import it. To use this YouTube transcript, select **Import YouTube Transcript**. (If you want to modify the YouTube transcript, import the YouTube transcript into Studio, and then select **Download Transcript for Editing**. You can then make your changes and upload the new file by selecting **Upload New Transcript**.)

- If both edX and YouTube have a transcript for your video, but the edX transcript is out of date, you receive a message asking if you want to replace the edX transcript with the YouTube transcript. To use the YouTube transcript, select **Yes, replace the edX transcript with the YouTube transcript**.

- If neither edX nor YouTube has a transcript for your video, and your transcript uses the .srt format, select **Upload New Transcript** to upload the transcript file from your computer.

    Note:

    - If you want to provide a transcript in a format such as .pdf, do not use this field to upload the transcript. For more information, see *Add a Supplemental Downloadable Transcript*.

    - If your transcript uses the .sjson format, do not use this field. For more information, see *Steps for .sjson Files*.

6. Optionally, select **Advanced** to set more options for the video. For a description of each option, see *Setting Advanced Options*.

7. Select **Save.**

Setting Advanced Options

The following options appear on the **Advanced** page of the video component.

Component Display Name	The name that you want your learners to see. This is the same as the **Display Name** field on the **Basic** tab.
Default Timed Transcript	The name of the transcript file that was specified in the **Default Timed Transcript** field on the **Basic** page. You do not have to change this setting.
Download Transcript Allowed	Specifies whether you want to allow learners to download the timed transcript. If you select **True**, a link to download the file appears below the video. By default, Studio creates a .txt transcript when you upload an .srt transcript. Learners can download the .srt or .txt versions of the transcript when you set **Download Transcript Allowed** to **True**. If you want to provide the transcript for download in a different format as well, such as .pdf, upload a file to Studio by using the **Upload Handout** field.
Downloadable Transcript URL	The URL for a non-.srt version of the transcript file posted on the **Files & Uploads** page or on the Internet. Learners see a link to download the non-.srt transcript below the video. When you add a transcript to this field, only the transcript that you add is available for download. The .srt and .txt transcripts become unavailable. If you want to provide a downloadable transcript in a format other than .srt, edX recommends that you upload a handout for learners by using the **Upload Handout** field. For more information, see *Add a Supplemental Downloadable Transcript*.
EdX Video ID	An optional field used only by course teams that are working with edX to process and host video files.
License	Optionally, you can set the license for the video, if you want to release the video with a license different from the overall course license. • Select **All Rights Reserved** to indicate to learners that you own the copyright for the video. • Select **Creative Commons** to grant others the right to share and use the video. You must then select the Creative Commons license options to apply. The license options that you select control the copyright notice that learners see for the video. For more information, see *Licensing a Course*.
Show Transcript	Specifies whether the transcript plays along with the video by default.
Transcript Languages	The transcript files for any additional languages. For more information, see *Add a Transcript in Another Language*.
Upload Handout	Allows you to upload a handout to accompany this video. Your handout can be in any format. Learners can download the handout by selecting **Download Handout** under the video. For more information, see *Add a Supplemental Downloadable Transcript*.
Video Available on Web Only	If you select **True**, learners are only allowed to play this video in a Web browser. If you select **False**, learners can use any compatible application to play the video, including Web browsers and mobile apps.
Video Download Allowed	Specifies whether learners can download versions of this video in different formats if they cannot use the edX video player or do not have access to YouTube. If you select **True**, you must add at least one non-YouTube

6.2.6 Including Optional Collateral

After you add a video component to your course, you can provide optional collateral to accompany the video.

- *Add a Video Table of Contents*
- *Add a Supplemental Downloadable Transcript*
- *Add a Transcript in Another Language*
- *Steps for .sjson Files*

Add a Video Table of Contents

You can add a table of contents for your video by adding an .srt file that contains links to different parts of the video. When your learners view the video, they can select **CC** to switch between the main transcript for the video and the table of contents.

To add a table of contents, you work with a third-party service to create an .srt file. Then, you use the **Transcript Languages** setting in the video component to associate the .srt file with the video.

1. After you obtain the .srt file that will function as the table of contents, open the video component for the video.

2. On the **Advanced** tab, scroll down to **Transcript Languages**, and then select **Add**.

3. Select **Table of Contents**.

4. Select **Upload**, browse to the .srt file, and then select **Open**.

5. In the **Upload translation** dialog box, select **Upload**.

Add a Supplemental Downloadable Transcript

By default, a .txt file is created when you upload an .srt file, and learners can download either the .srt or .txt transcript when you set **Download Transcript Allowed** to **True**. **Download Transcript** appears below the video, and learners see the .srt and .txt options when they move the cursor over that option.
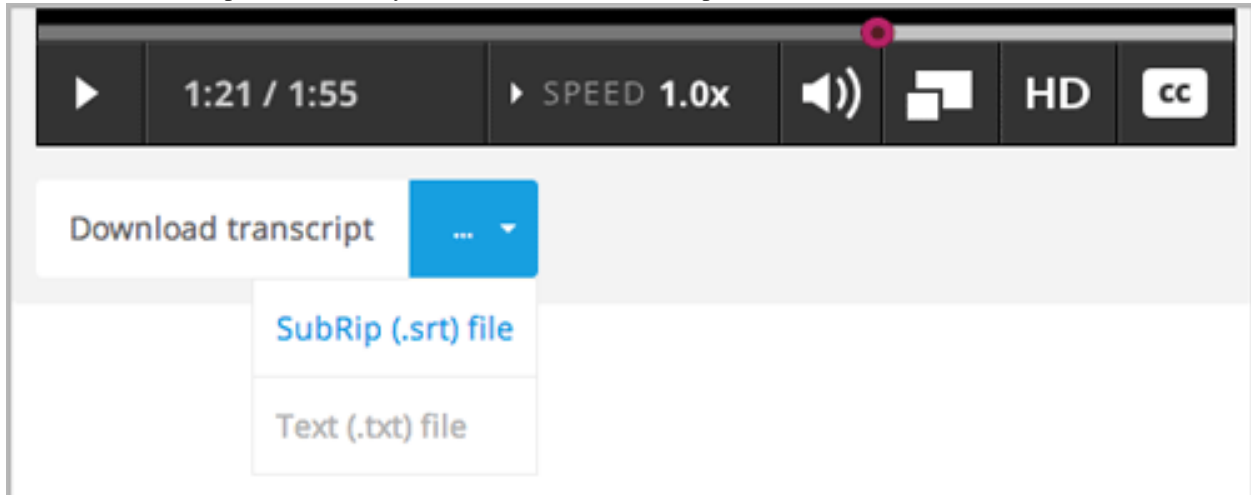
To provide a downloadable transcript in a format such as .pdf along with the .srt and .txt transcripts, you use the **Upload Handout** advanced setting. When you do this, **Download Handout** appears to the right of the **Download Transcript** in the video player, and learners can download the .srt, .txt, or handout version of the transcript.
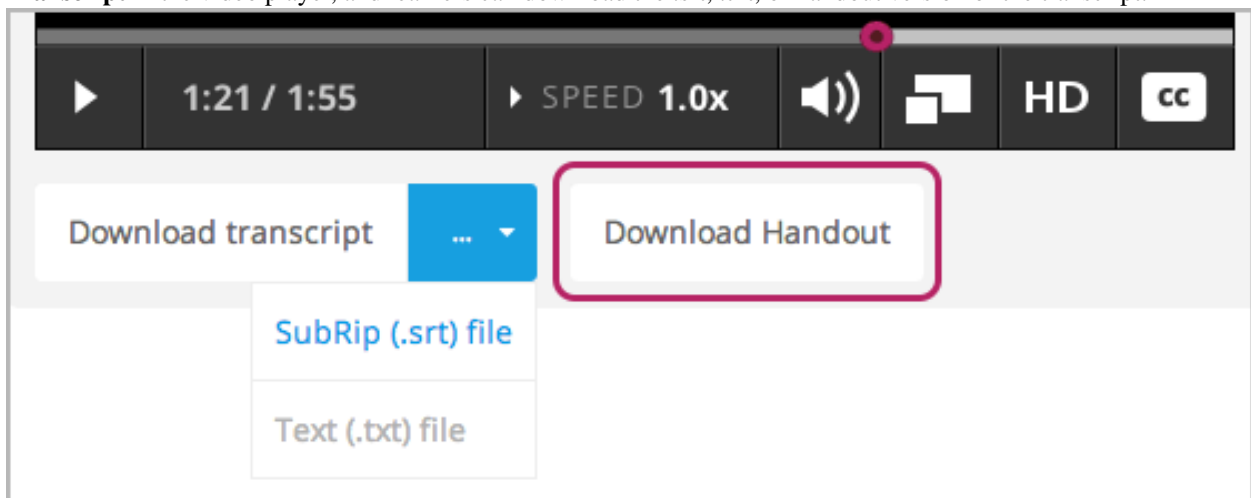
To add a downloadable transcript, follow these steps.

1. Create or obtain your transcript as a .pdf or in another format.

2. In the video component, select **Advanced**.

3. Locate **Upload Handout**, and then select **Upload**.

4. In the **Upload File** dialog box, select **Choose File**.

5. In the dialog box, select the file on your computer, and then select **Open**.

6. In the **Upload File** dialog box, select **Upload**.

Add a Transcript in Another Language

You can provide transcripts for your video in other languages. To do this, you work with a third-party service to obtain an .srt transcript file for each language, and then associate the .srt file with the video in Studio.

Before you add transcript files, make sure that each one has a unique name. If you use the same transcript name in more than one video component, the same transcript will play for each video. To avoid this problem, you could name your foreign language transcript files according to the video's file name and the transcript language.

For example, you have two videos, named video1.mp4 and video2.mp4. Each video has a Russian transcript and a Spanish transcript. You can name the transcripts for the first video video1_RU.srt and video1_ES.srt, and name the transcripts for the second video video2_RU.srt and video2_ES.srt.

To add the transcripts to a video component, follow these steps.

1. After you obtain the .srt files for additional languages, open the video component for the video.

2. On the **Advanced** tab, scroll down to **Transcript Languages**, and then select **Add**.

3. Select the language for the transcript that you want to add.

4. Select **Upload**, browse to the .srt file for the language that you want, and then select **Open**.

5. In the **Upload translation** dialog box, select **Upload**.

6. Repeat steps 2 - 5 for any additional languages.

When your learners view the video, they can select **CC** to select a language.
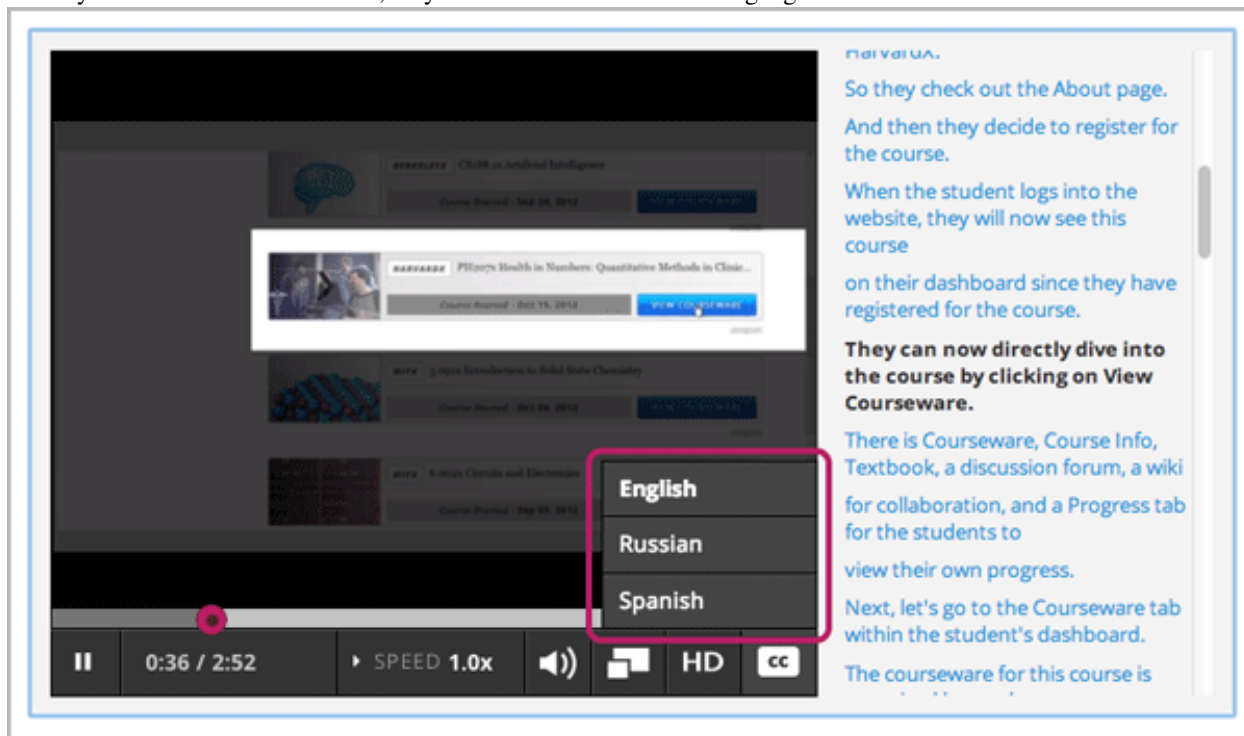
Steps for .sjson Files

If your course uses .sjson files, you upload the .sjson file for the video to the **Files & Uploads** page, and then specify the name of the .sjson file in the video component.

Note: Only older courses that have used .sjson files in the past should use .sjson files. All new courses should use .srt

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files.

1. Obtain the .sjson file from a media company such as 3Play.

2. Change the name of the .sjson file to use the following format.

   ```
   subs_{video filename}.srt.sjson
   ```

   For example, if the name of your video is **Lecture1a**, the name of your .sjson file must be **subs_Lecture1a.srt.sjson**.

3. Upload the .sjson file for your video to the **Files & Uploads** page.

4. Edit or create the video component.

5. Select **Advanced**.

6. In the **Default Timed Transcript** field, enter the file name of your video. Do not include *subs_* or *.sjson*. For the example in step 2, you would only enter **Lecture1a**.

7. Set the other options that you want.

8. Select **Save**.

6.3 Working with Discussion Components

This section describes how to work with discussion components in Studio.

- *Overview*
- *Create a Discussion Component*
- *A Learner's View of the Discussion*

6.3.1 Overview

You can add discussion components to a unit to pose questions related to the unit and give learners a chance to respond and interact on a specific subject.

Discussion topics that you create by adding discussion components in your courseware are known as content-specific discussion topics.

For more information about discussions, see these topics.

- *Managing Course Discussions*

- *Guidance for Discussion Moderators*

- *Setting up Discussions in Courses with Cohorts*

6.3.2 Create a Discussion Component

Note: We recommend that you add an HTML component before each discussion component to introduce the topic that you want learners to discuss. The discussion component itself does not contain any text and can be easy for learners to overlook.

1. Under **Add New Component**, select **Discussion**.

> **Warning:** You should always use these steps to create a discussion component. Do not create discussion
> components by using the **Duplicate** button in Studio. Duplicated discussion components result in discussion
> topics containing the same conversations, even if users post in different discussions.

2. In the discussion component that appears, select **Edit**.
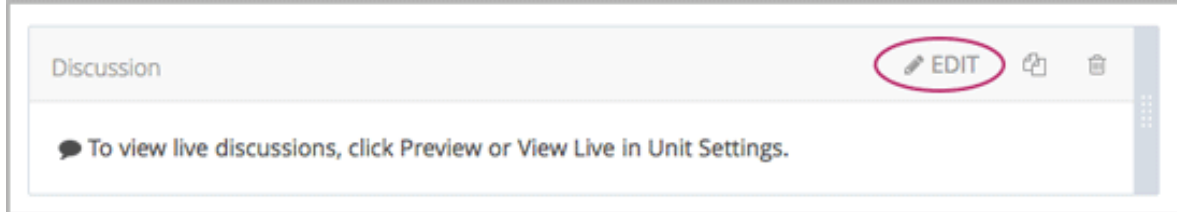
3. Follow the guidelines in the editor to fill in the **Category**, the optional **Display Name**, and the **Subcategory** fields.

The value in the **Display Name** field identifies the discussion in the course content. The values in the **Category**
and **Subcategory** fields are visible to learners in the list of discussion topics on the **Discussion** tab.

Note: Each **Category/Subcategory** pair for the discussion topics in your course must be unique.

---
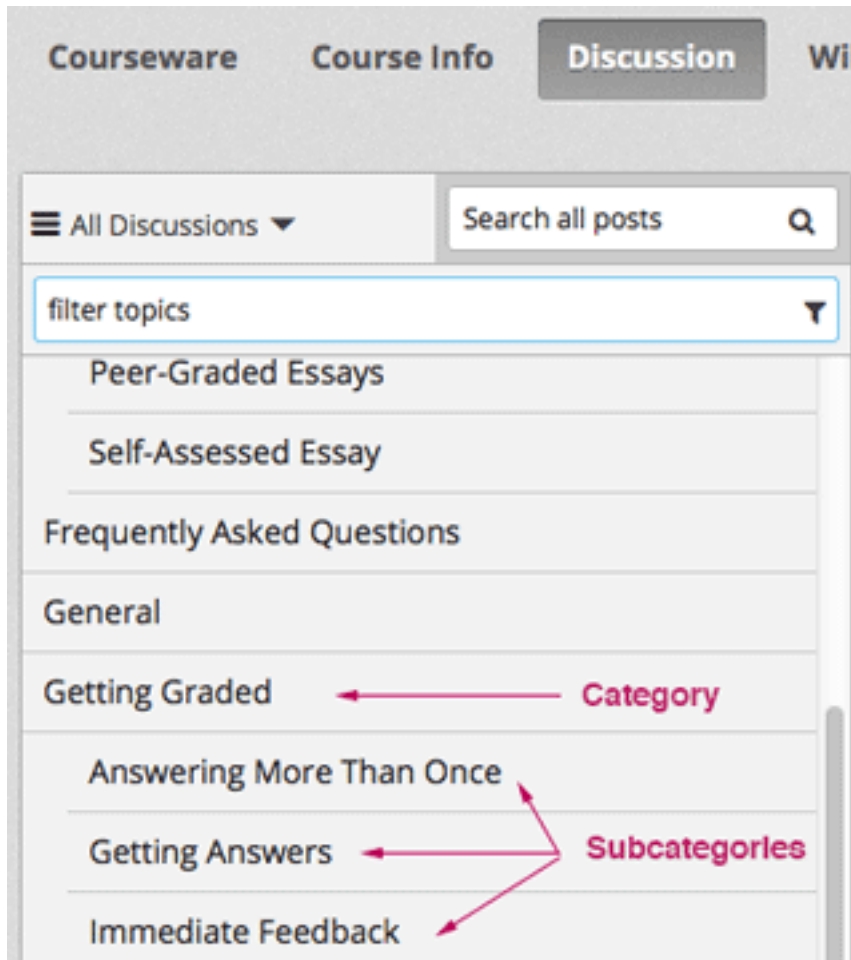
4. Select **Save**.

Note: On the **Discussion** tab, you cannot see category and subcategory names of discussion components that you created until after the course has started and the unit is released. For more details about when discussion topics are visible, see *Visibility of Discussion Topics*.

6.3.3 A Learner's View of the Discussion

For learners, the display name for the discussion component appears in the learning sequence at the top of the page.
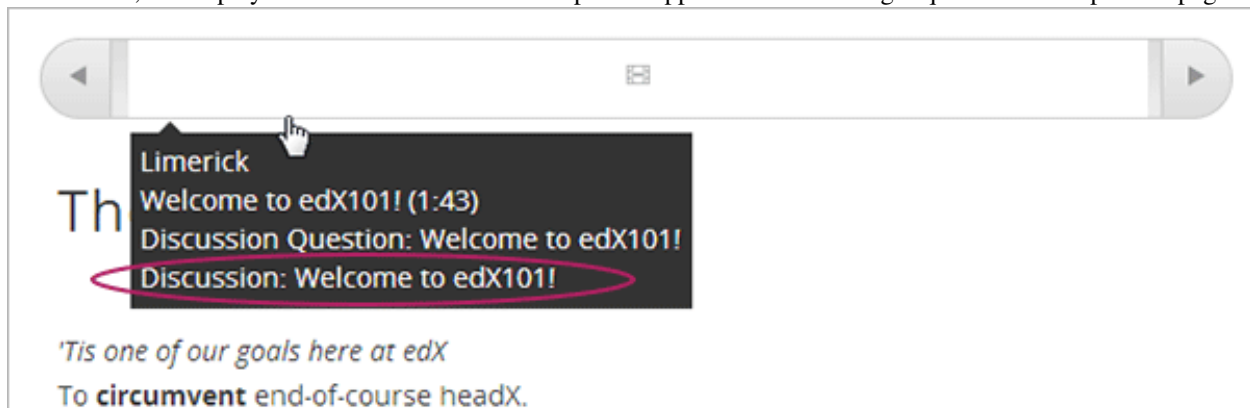
The discussion space appears under other components in the unit. It does not have a label in the body of the unit. Instead, learners see "Show discussion" or "Hide discussion" on the left, and a blue **New Post** button on the right.

In the following example, the discussion component follows video and HTML components.

In the **Discussion** tab at the top of the page, learners can find the category and subcategory of the discussion in the left pane.
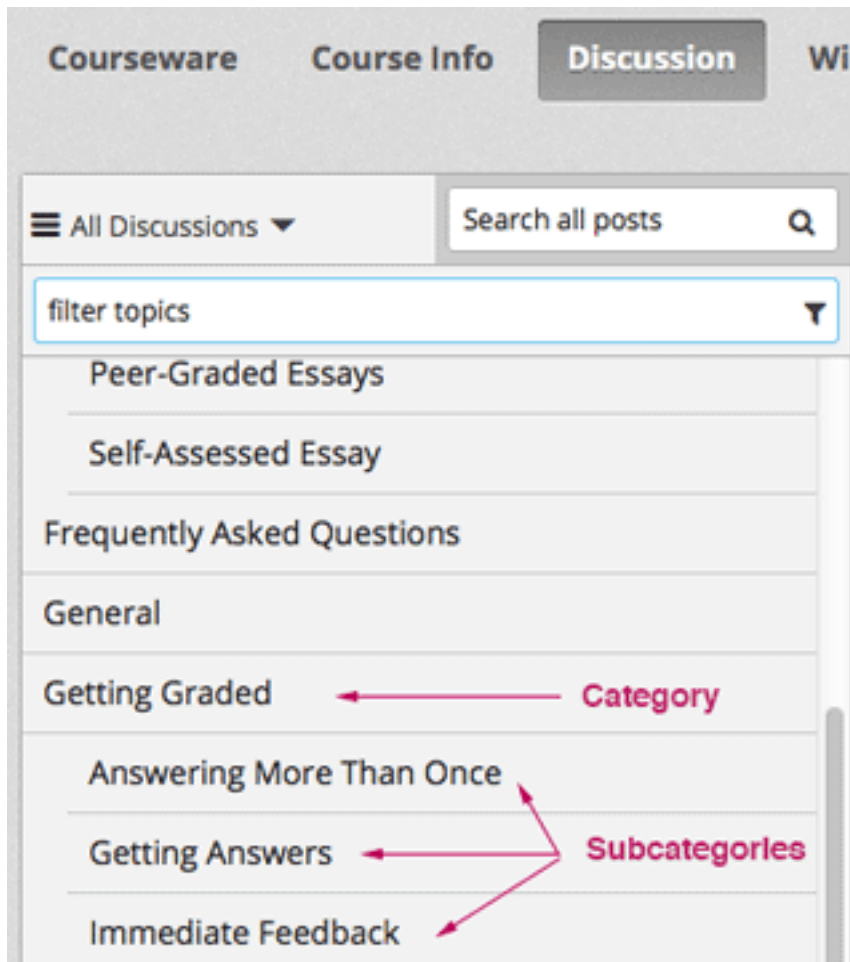
6.4 Working with Problem Components

This section covers the basics of problem components: what they look like to you and your learners, and the options that every problem component has.

- *Overview*
- *Graded Problems*
- *The Learner View of a Problem*
- *The Studio View of a Problem*
- *Problem Settings*
- *Modifying a Released Problem*
- *Multiple Problems in One Component*
- *Adding Feedback and Hints to a Problem*
- *Problem Randomization*

For more information about individual problem types, see *Creating Exercises and Tools*.

6.4.1 Overview

The problem component allows you to add interactive, automatically graded exercises to your course content. You can create many different types of problems in Studio.

6.4.2 Graded Problems

All problems receive a point score, but, by default, problems do not count toward a learner's grade.

To have problems to count toward the grade, change the assignment type of the subsection that contains the problems. For more information, see *Set the Assignment Type and Due Date for a Subsection*.

6.4.3 The Learner View of a Problem

All problems on the edX platform have several component parts.

1. **Problem text.** The problem text can contain any standard HTML formatting.

2. **Response field with the learner's answer.** Learners enter answers in *response fields*. The appearance of the response field depends on the type of the problem.

3. **Rendered answer.** For some problem types, Studio uses MathJax to render plain text as "beautiful math".

4. **Check button.** The learner selects **Check** to submit a response or find out if his answer is correct. If the answer is correct, a green check mark appears. If it is incorrect, a red X appears. When the learner selects the **Check** button, the Learning Management System saves the grade and current state of the problem.

5. **Save button.** The learner can select **Save** to save her current response without submitting it for a grade. This allows the learner to stop working on a problem and come back to it later.

6. **Show Answer button.** This button is optional. When the learner selects **Show Answer**, she sees both the correct answer (see 2 above) and the explanation (see 10 below). You define whether the **Show Answer** button is visible.

7. **Attempts.** You can set a specific number of attempts, or allow unlimited attempts for a problem. By default, the course-wide **Maximum Attempts** advanced setting is null, meaning that the maximum number of attempts for problems is unlimited. If the course-wide **Maximum Attempts** setting is changed to a specific number, the **Maximum Attempts** setting for individual problems defaults to that number, and cannot be set to unlimited.

8. **Feedback.** After a learner selects **Check**, all problems return a green check mark or a red X.

9. **Correct answer.** Most problems require that you specify a single correct answer.

10. **Explanation.** You can include an explanation that appears when a learner selects **Show Answer**.

11. **Reset button.** Learners can select **Reset** to clear any input that has not yet been submitted, and try again to answer the question.

   - If the learner has already submitted an answer, selecting **Reset** clears the submission and, if the problem includes a Python script to randomize variables and the randomization setting is **On Reset**, changes the values the learner sees in the problem.

   - If the number of Maximum Attempts that was set for this problem has been reached, the **Reset** button is not visible.

1. **Hide Answer button.**

2. **Grading.** You can specify whether a group of problems is graded. If a group of problems is graded, a clock icon appears for that assignment in the left pane.

3. **Due date.** The date that the problem is due. A problem that is past due does not have a **Check** button. It also does not accept answers or provide feedback.

Note: Problems can be **open** or **closed.** Closed problems do not have a **Check** button. Learners can still see questions, solutions, and revealed explanations, but they cannot check their work, submit responses, or change an earlier score.

There are also some attributes of problems that are not immediately visible. You can set these attributes in Studio.

- **Randomization.** In certain types of problems, you can include a Python script to randomize the values that are presented to learners. You use this setting to define when values are randomized.

- **Weight. Different problems in a particular problem set can be** given different weights.

- **Label.** To improve accessibility for learners who have disabilities, each problem needs a descriptive label. The label typically contains part or all of the text of the question in the problem. Most templates include a space for a label. You can find example labels in the documentation for each problem or tool type.

6.4.4 The Studio View of a Problem

All problems are written in XML. However, Studio offers two interfaces for editing problem components: the Simple Editor and the Advanced Editor.

- The Simple Editor allows you to edit problems visually, without having to work with XML.

- The Advanced Editor converts the problem to edX's XML standard and allows you to edit that XML directly.

You can switch at any time from the Simple Editor to the Advanced Editor by selecting **Advanced Editor** in the top right corner of the Simple Editor interface. However, after you save a problem in the Advanced Editor, you cannot open it again in the Simple Editor.

The Simple Editor

When you select the following problem types, the Simple Editor opens with a preformatted example problem.

- *Checkbox Problem*: In checkbox problems, learners select one or more options from a list of possible answers.

- *Dropdown Problem*: In dropdown problems, learners select one answer from a dropdown list.

- *Multiple Choice Problem*: Multiple choice problems require learners to select one answer from a list of choices that appear directly below the question.

- *Numerical Input Problem*: Numerical input problems require answers that include only integers, fractions, and a few common constants and operators.

- *Text Input Problem*: In text input problems, learners enter a short text answer to a question.

The following image shows an example multiple choice problem in the Simple Editor.

The Simple Editor includes a toolbar with options that provide the required formatting for different types of problems. When you select an option from the toolbar, formatted sample text appears in the Simple Editor. Alternatively, you can apply formatting to your own text by selecting the text and then one of the toolbar options.

Descriptions of the toolbar options follow.

1. **Heading 1**: Format text as a first level heading.

2. **Multiple Choice**: Identify the text on each selected line as an answer option for a multiple choice problem.

3. **Checkboxes**: Identify the text on each selected line as an answer option for a checkboxes problem.

4. **Text Input**: Identify the correct answer for a text input problem.

5. **Numerical Input**: Identify the correct answer, with an optional tolerance, for a numerical input problem.

6. **Dropdown**: Identify a comma-separated list as the answer options for a dropdown problem.

7. **Explanation**: Format text as an explanation that appears when learners select **Show Answer**.

8. Open the problem in the Advanced Editor.

9. Open a list of formatting hints.

10. **Accessible Label**: Identify the question as the problem's accessible label. No toolbar option is available, but when you surround text with two pairs of angle brackets pointing inward (>>question<<), screen readers use that text as the accessible label for the problem. In addition, edX Insights uses the accessible label to identify the question in each problem. For more information, see Using edX Insights.

The Advanced Editor

The **Advanced Editor** opens a problem in XML. Templates for problems such as such as drag and drop and math expression input open directly in the Advanced Editor.

The following image shows the multiple choice problem above in the Advanced Editor instead of the Simple Editor.
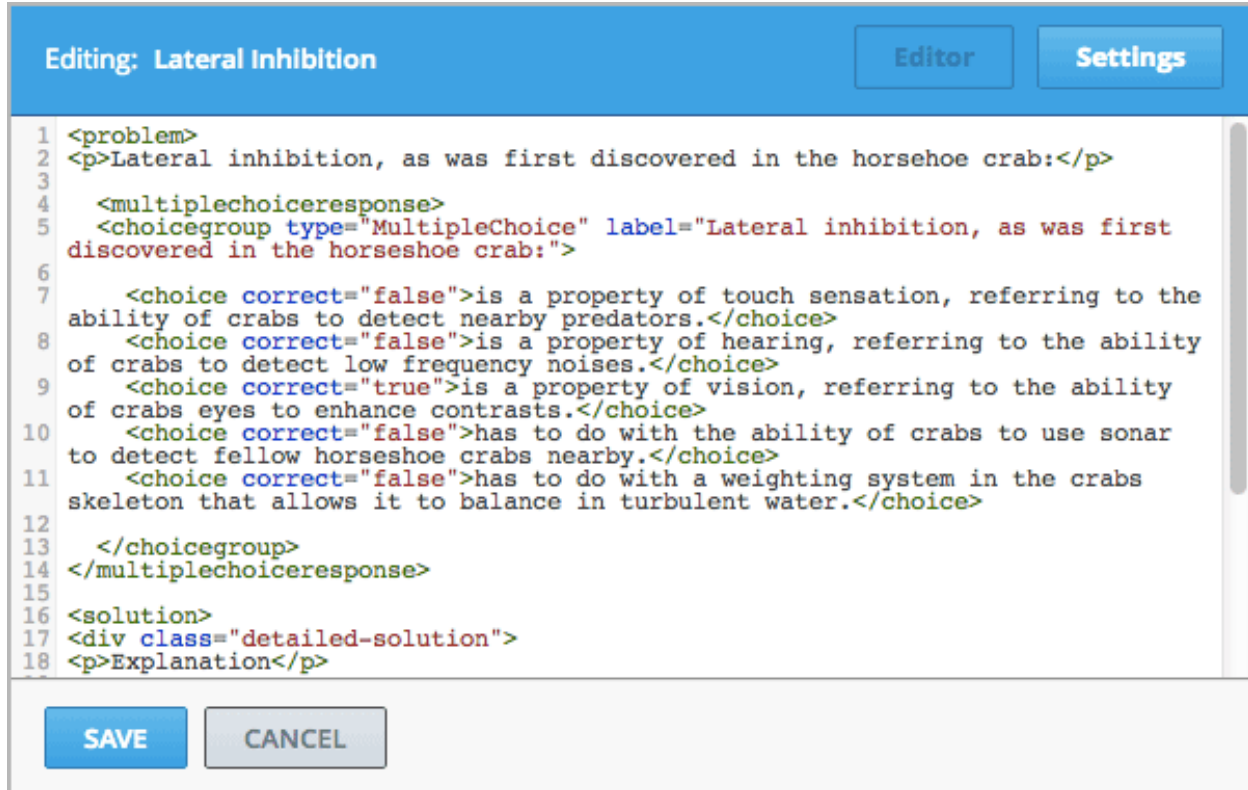
The following problem templates open in the Advanced Editor.

- *Circuit Schematic Builder Problem* In circuit schematic problems, learners create and modify circuits on an interactive grid and submit computer- generated analyses of the circuits for grading.

- *Custom JavaScript Problem* With custom JavaScript problems, you can create a custom problem or tool that uses JavaScript and add it directly into Studio.

- *Drag and Drop Problem* Drag and drop problems require learners to drag text or objects to a specific location on an image.

- *Image Mapped Input Problem* Image mapped input problems require learners to select a specific location on an image.

- *Math Expression Input Problems* Math expression input problems require learners to enter a mathematical expression as text, such as e=m*c^2.

- *Problem with Adaptive Hint* These problems can give learners feedback or hints based on their responses. Problems with adaptive hints can be text input or multiple choice problems.

- *Problem Written in LaTeX* This problem type allows you to convert problems that you previously wrote in LaTeX into the edX format. Note that this problem type is a prototype, and is not supported.

- *Write-Your-Own-Grader Problem* Custom Python-evaluated input (also called "write-your-own-grader" problems evaluate learners' responses using an embedded Python script that you create. These problems can be of any type.

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6.4.5 Problem Settings

In addition to the text of the problem, problems that you create using a problem component have the following settings. To access these settings you select **Settings** in the component editor.

- *Display Name*
- *Maximum Attempts*
- *Problem Weight*
- *Randomization*
- *Show Answer*
- *Show Reset Button*
- *Timer Between Attempts*

Display Name

This setting indicates the name of your problem. This name appears for learners as a heading above the problem and as a tooltip in the learning sequence at the top of the **Courseware** page.

In addition, edX Insights uses the display name to identify each problem. Unique, descriptive display names help you identify problems quickly and accurately for analysis. For more information, see Using edX Insights.

Maximum Attempts

This setting specifies the number of times that a learner is allowed to attempt answering a problem. By default, the course-wide **Maximum Attempts** advanced setting is null, meaning that the maximum number of attempts for

problems is unlimited. If the course-wide **Maximum Attempts** setting is changed to a specific number, the **Maximum Attempts** setting for individual problems defaults to that number, and cannot be set to unlimited.

Note: edX recommends setting **Maximum Attempts** to either unlimited or a very large number. Unlimited attempts allow for mastery learning and encourages risk taking and experimentation, both of which lead to improved learning outcomes. Allowing for unlimited attempts might be impossible in some courses, such as those where grading is primarily based on multiple choice questions.

Note: Only questions that have a **Maximum Attempts** setting of 1 or higher are included in the answer distribution computations used in edX Insights and the Student Answer Distribution report.

Problem Weight

Note: The Learning Management System stores scores for all problems, but scores only count toward a learner's final grade if they are in a subsection that is graded.

This setting specifies the total number of points possible for the problem. The problem weight appears next to the problem's display name.

By default, each response field, or "answer space", in a problem component is worth one point. Any problem component can have multiple response fields. For example, the problem component above contains one dropdown problem that has three separate questions, and also has three response fields.

You can increase or decrease the weight for a problem component by entering a **Problem Weight**.

Computing Scores

The score that a learner earns for a problem is the result of the following formula.

Score = Weight × (Correct answers / Response fields)

- **Score** is the point score that the learner receives.
- **Weight** is the problem's maximum possible point score.
- **Correct answers** is the number of response fields that contain correct answers.
- **Response fields** is the total number of response fields in the problem.

Examples

The following are some examples of computing scores.

Example 1

A problem's **Weight** setting is left blank. The problem has two response fields. Because the problem has two response fields, the maximum score is 2.0 points.

If one response field contains a correct answer and the other response field contains an incorrect answer, the learner's score is 1.0 out of 2 points.

Example 2

A problem's weight is set to 12. The problem has three response fields.

If a learner's response includes two correct answers and one incorrect answer, the learner's score is 8.0 out of 12 points.

Example 3

A problem's weight is set to 2. The problem has four response fields.

If a learner's response contains one correct answer and three incorrect answers, the learner's score is 0.5 out of 2 points.

Randomization
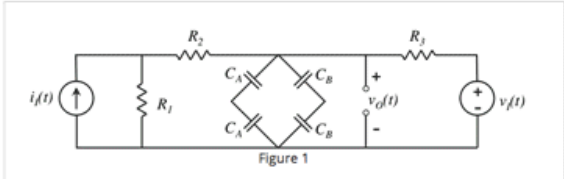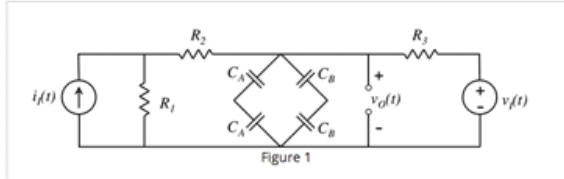
For problems that include a Python script to generate numbers randomly, this setting specifies how frequently the values in the problem change: each time a different learner accesses the problem, each time a single learner tries to answer the problem, both, or never.

Note: This setting should only be set to an option other than **Never** for problems that are configured to do random number generation.

For example, in this problem, the highlighted values change each time a learner submits an answer to the problem.

If you want to randomize numeric values in a problem, you complete both of these steps.

- Make sure that you edit your problem to include a Python script that randomly generates numbers.

- Select an option other than **Never** for the **Randomization** setting.

Note: The **Randomization** setting serves a different purpose from "problem randomization". The **Randomization** setting affects how numeric values are randomized within a single problem and requires the inclusion of a Python script. Problem randomization offers different problems or problem versions to different learners. For more information, see *Problem Randomization*.

The edX Platform has a 20-seed maximum for randomization. This means that learners see up to 20 different problem variants for every problem that has **Randomization** set to an option other than **Never**. It also means that every answer for the 20 different variants is reported by the Answer Distribution report and edX Insights. Limiting the number of variants to a maximum of 20 allows for better analysis of learner submissions by allowing you to detect common incorrect answers and usage patterns for such answers.

For more information, see *Student Answer Distribution* in this guide, or *Review Answers to Graded Problems* or *Review Answers to Ungraded Problems* in *Using edX Insights*.

Important: Whenever you choose an option other than **Never** for a problem, the computations for the Answer Distribution report and edX Insights include up to 20 variants for the problem, even if the problem was not actually configured to include randomly generated values. This can make data collected for problems that cannot include randomly generated values, (including, but not limited to, all multiple choice, checkboxes, dropdown, and text input problems), extremely difficult to interpret.

You can choose the following options for the **Randomization** setting.

Option	Description
Always	Learners see a different version of the problem each time they select Check.
On Reset	Learners see a different version of the problem each time they select Reset.
Never	All learners see the same version of the problem. For most courses, this option is supplied by default. Select this option for every problem in your course that does not include a Python script to generate random numbers.
Per Student	Individual learners see the same version of the problem each time they look at it, but that version is different from the version that other learners see.

Show Answer

This setting defines when learners are shown the answers to a problem and has the following options

Always	Always show the answer when the learner selects the **Show Answer** button.
Answered	Show the answer after the learner tries to answer the problem. If the question can be, and is, reset, the answer is not shown until the learner tries the problem again. (When a learner answers a question, the question is considered to be both attempted and answered. When the question is reset, the question is still attempted, but not yet answered.)
Attempted	Show the answer after the learner tries to answer the problem. If the question can be, and is, reset, the answer continues to show. (When a learner answers a question, the question is considered to be both attempted and answered. When the question is reset, the question is still attempted, but not yet answered.)
Closed	Show the answer after the learner has used up all his attempts to answer the problem or the due date has passed.
Finished	Show the answer after the learner has answered the problem correctly, the learner has no attempts left, or the problem due date has passed.
Correct or Past Due	Show the answer after the learner has answered the problem correctly or the problem due date has passed.
Past Due	Show the answer after the due date for the problem has passed.
Past Due	Never show the answer. In this case, a **Show Answer** button does not appear next to the problem in Studio or in the LMS.

Show Reset Button

This setting defines whether a **Reset** button is visible on the problem.

Learners can select **Reset** to clear any input that has not yet been submitted, and try again to answer the problem.

If the learner has already submitted an answer, selecting **Reset** clears the submission and, if the problem contains randomized variables and randomization is set to **On Reset**, changes the values in the problem.

If the number of Maximum Attempts that was set for this problem has been reached, the **Reset** button is not visible.

This problem-level setting overrides the course-level **Show Reset Button for Problems** setting.

Timer Between Attempts

This setting specifies the number of seconds that a learner must wait between submissions for a problem that allows multiple attempts. If the value is 0, the learner can attempt the problem again immediately after an incorrect attempt.

Adding required wait time between attempts can help to prevent learners from simply guessing when multiple attempts are allowed.

If a learner attempts a problem again before the required time has elapsed, she sees a message below the problem indicating the remaining wait time. The format of the message is, "You must wait at least {n} seconds between submissions. {n} seconds remaining."

6.4.6 Modifying a Released Problem

> **Warning:** Be careful when you modify problems after they have been released. Changes that you make to published problems can affect the learner experience in the course and analysis of course data.

After a learner submits a response to a problem, the edX Learning Management System (LMS) stores that response, the score that the learner received, and the maximum score for the problem. For problems with a **Maximum Attempts** setting greater than 1, the LMS updates these values each time the learner submits a new response to a problem. However, if you change a problem or its attributes, existing learner information for that problem is not automatically updated.

For example, you release a problem and specify that its answer is 3. After some learner have submitted responses, you notice that the answer should be 2 instead of 3. When you update the problem with the correct answer, the LMS does not update scores for learners who originally answered 2 for the problem and received the wrong score.

For another example, you change the number of response fields to three. Learners who submitted answers before the change have a score of 0, 1, or 2 out of 2.0 for that problem. Learners who submitted answers after the change have scores of 0, 1, 2, or 3 out of 3.0 for the same problem.

If you change the weight setting for the problem in Studio, however, existing scores update when the learner's **Progress** page is refreshed. In a live section, learners will see the effect of these changes.

Workarounds

If you have to modify a released problem in a way that affects grading, you have two options to ensure that every learner has the opportunity to submit a new response and be regraded. Note that both options require you to ask your learners to go back and resubmit answers to a problem.

- In the problem component that you changed, increase the number of attempts for the problem, then ask all your learners to redo the problem.

- Delete the entire problem component in Studio and create a new Problem component with the content and settings that you want, then ask all your learners to complete the new problem. (If the revisions you must make are minor, duplicate the problem component before you delete it and revise the copy.)

For information about how to review and adjust learner grades in the LMS, see *Student Grades and Grading*.

6.4.7 Multiple Problems in One Component

You might want to create a problem that has more than one response type. For example, you might want to create a numerical input problem and then include a multiple choice question about that numerical input problem. Or, you might want a learner to be able to check the answers to many problems at one time. To do this, you can include multiple problems inside a single problem component. The problems can be different types.

> **Note:** You cannot use a *Custom JavaScript Problem* in a component that contains more than one problem. Each custom JavaScript problem must be in its own component.

To create multiple problems in one component, create a new Blank Advanced problem component, and then add the XML for each problem in the component editor. You only need to include the XML for the problem and its answers. You do not have to include the code for other elements, such as the **Check** button.

Elements such as the **Check**, **Show Answer**, and **Reset** buttons, as well as the settings that you select for the problem component, apply to all of the problems in that component. Thus, if you set the maximum number of attempts to 3, the learner has three attempts to answer the entire set of problems in the component as a whole rather than three attempts to answer each problem individually. If a learner selects **Check**, the LMS scores all of the problems in the component at once. If a learner selects **Show Answer**, the answers for all the problems in the component appear.

6.4.8 Adding Feedback and Hints to a Problem

You can add feedback, hints, or both to the following problem types.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

By using hints and feedback, you can provide learners with guidance and help as they work on problems.

Feedback in Response to Attempted Answers

You can add feedback that is displayed to learners when they submit an answer.

For example, the following multiple choice problem provides feedback in response to the selected option when the learner selects **Check**. In this case, feedback is given for an incorrect answer.

MULTIPLE CHOICE WITH HINTS AND FEEDBACK (1 point possible)

You can provide feedback for each option in a multiple choice problem.

You can also add hints for learners.

Be sure to select Settings to specify a Display Name and other values that apply.

Use the following example problem as a model.

Which of the following is a vegetable?

- ○ apple
- ● pumpkin ✖
- ○ potato
- ○ tomato

Incorrect: A pumpkin is the fertilized ovary of a squash plant and contains seeds, meaning it is a fruit.

[Check] [**Hint**]

Best Practices for Providing Feedback

The immediacy of the feedback available to learners is a key advantage of online instruction and difficult to do in a traditional classroom environment.

You can target feedback for common incorrect answers to the misconceptions that are common for the level of the learner (for example, elementary, middle, high school, college).

In addition, you can create feedback that provides some guidance to the learner about how to arrive at the correct answer. This is especially important in text input and numeric input problems, because without such guidance, learners might not be able to proceed.

You should also include feedback for the correct answer to reinforce why the answer is correct. Especially in questions where learners are able to guess, such as multiple choice and dropdown problems, the feedback should provide a reason why the selection is correct.

General Hints to a Problem

You can add one or more hints that are displayed to learners. When you add hints, the **Hint** button is automatically displayed to learners. Learners can access the hints by selecting **Hint** beneath the problem. A learner can view multiple hints by selecting **Hint** multiple times.

For example, in the following multiple choice problem, the learner selects **Hint** before attempting the answer.

The hint indicates that it is the first of two hints. The learner selects **Hint** a second time.

MULTIPLE CHOICE WITH HINTS AND FEEDBACK

○   Which of the following is an example of a vegetable?
         ○ apple
         ○ pumpkin
         ○ potato
         ○ tomato

Hint (2 of 2): A fruit contains seeds of the plant.

    Check   **Hint**

Best Practices for Providing Hints

To ensure that your hints can assist learners with varying backgrounds and levels of understanding, you should provide multiple hints with different levels of detail.

For example, the first hint can orient the learner to the problem and help those struggling to better understand what is being asked.

The second hint can then take the learner further towards the answer.

In problems that are not graded, the third and final hint can explain the solution for learners who are still confused.

Create Problems with Feedback and Hints

You create problems with feedback and hints in Studio. Templates with feedback and hints configured are available to make creating your own problems easier.

While editing a unit, in the **Add New Component** panel, select **Problem**. In the list that opens, select the **Common Problem Types** tab. Templates for problems with feedback and hints are listed.

Common Problem Types	Advanced

Blank Common Problem

Checkboxes

Dropdown

Multiple Choice

Numerical Input

Text Input

Checkboxes with Hints and Feedback

Dropdown with Hints and Feedback

Multiple Choice with Hints and Feedback

Numerical Input with Hints and Feedback

Text Input with Hints and Feedback

Cancel

Add the problem type you need to the unit, then edit the component. The exact syntax you use to configure hints and feedback depends on the problem type. See the topic for the problem type for more information.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

6.4.9 Problem Randomization

You might want to present different learners with different problems, or different versions of the same problem. To do this, you create a problem component for each problem or version in Studio, and then edit your course outside of Studio, in OLX, to randomize the problem that learners see.

Note that *problem randomization* is different from the **Randomization** setting in Studio. The **Randomization** setting controls when a Python script within a single problem randomizes variables. Problem randomization offers different problems or problem versions to different learners.

Note: Creating problems with versions that can be randomized requires you to export your course, edit some of your course's XML files in a text editor, and then re-import your course. We recommend that you create a backup copy of your course before you do this. We also recommend that you only edit your course files in the text editor if you are very familiar with editing XML.

Terminology

Sections, subsections, units, and components have different names in the **Course Outline** view and in the list of files that you'll see after you export your course and open the .xml files for editing. The following table lists the names of these elements in the **Course Outline** view and in a list of files.

Course Outline View	File List
Section	Chapter
Subsection	Sequential
Unit	Vertical
Component	Discussion, HTML, problem, or video

For example, when you want to find a specific section in your course, look in the **Chapter** directory when you open the list of files that your course contains. To find a unit, look in the **Vertical** directory.

Create Randomized Problems

1. In the unit where you want to create a randomized problem, create a separate problem component for each version or problem that you want to randomize. For example, if you want to offer four versions or problems, create four separate problem components. Make a note of the 32-digit unit ID that appears in the **Unit Identifier** field under **Unit Location**.

2. Export your course. For more information, see *Exporting and Importing a Course*. Save and extract the .tar.gz file that contains your course in a memorable location so that you can find it easily.

3. In the list of directories and files, open the **Vertical** directory.

   Note: If your unit is not published, open the **Drafts** directory, and then open the **Vertical** directory in the **Drafts** folder.

   ---

4. In the **Vertical** folder, locate the .xml file that has the same name as the unit ID that you noted in step 1, and then open the file in a text editor such as Sublime. For example, if the unit ID is `e461de7fe2b84ebeabe1a97683360d31`, open the `e461de7fe2b84ebeabe1a97683360d31.xml` file.

   The file contains a list of all the components in the unit, together with the URL names of the components. For example, the following file contains four problem components.

```
<vertical display_name="Test Unit">
    <problem url_name="d9d0ceb3ffc74eacb29501183e26ad6e"/>
    <problem url_name="ea66d875f4bf4a9898d8e6d2cc9f3d6f"/>
    <problem url_name="2616cd6324704f85bc315ec46521485d"/>
    <problem url_name="88987707294d4ff0ba3b86921438d0c0"/>
</vertical>
```

5. Add `<randomize> </randomize>` tags around the components for the problems that you want to ran-
domize.

```
<vertical display_name="Test Unit">
  <randomize>
      <problem url_name="d9d0ceb3ffc74eacb29501183e26ad6e"/>
      <problem url_name="ea66d875f4bf4a9898d8e6d2cc9f3d6f"/>
      <problem url_name="2616cd6324704f85bc315ec46521485d"/>
      <problem url_name="88987707294d4ff0ba3b86921438d0c0"/>
  </randomize>
</vertical>
```

6. After you add the `<randomize> </randomize>` tags, save and close the .xml file.

7. Re-package your course as a .tar.gz file.

   For information about how to do this on a Mac, see How to Create a Tar GZip File from the Command Line.

   For information about how to do this on a Windows computer, see How to Make a .tar.gz on Windows.

8. In Studio, re-import your course.

Note:

- After you implement randomization, you can only see one of the versions or problems in Studio. You can edit
  that single problem directly in Studio, but to edit any of the other problems, you must export your course, edit
  the problems in a text editor, and then re-import the course. The same procedure applies to all course team
  members, regardless of their assigned roles.

- A .csv file for learner responses contains the responses to each of the problems in the problem bank.

Adding Tooltips to a Problem

To help learners understand terminology or other aspects of a problem, you can add inline tooltips. Tooltips show text
to learners when they move their cursors over a tooltip icon.

The following example problem includes two tooltips. The tooltip that provides a definition for "ROI" is being shown.
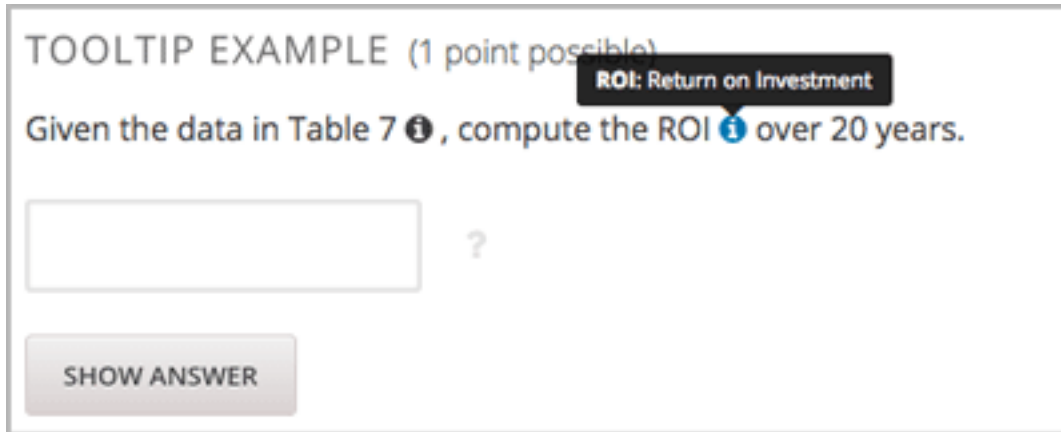
Note: For learners using a screen reader, the tooltip expands to make its associated text accessible when the screen reader focuses on the tooltip icon.

To add the tooltip, you wrap the text that you want to appear as the tooltip in the `clarification` element. For example, the following problem contains two tooltips.

```
<problem>
    <text>
        <p>Given the data in Table 7 <clarification>Table 7: "Example PV
           Installation Costs", Page 171 of Roberts textbook</clarification>,
           compute the ROI <clarification><strong>ROI</strong>: Return on
           Investment</clarification> over 20 years.
        </p>
    . . .
```

6.5 Working with Content Libraries

This section describes how to work with content libraries in Studio.

- *Content Libraries Overview*
- *Create a New Library*
- *Edit a Library*
- *Add Components to a Library*
- *View the Contents of a Library*
- *Edit Components in a Library*
- *Delete a Library*
- *Give Other Users Access to Your Library*
- *Exporting and Importing a Library*

6.5.1 Content Libraries Overview

In Studio, you can create a library to build a pool of components for use in randomized assignments in your courses. You can add HTML components, problems, and video components to a library. Peer assessment and discussion components are not supported in libraries.

Note: Content libraries are available only for courses that have course identifiers in this format: `{key`

`type}:{org}+{course}+{run}`. For example, `course-v1:edX+DemoX+Demo_2015`. Your course identifier appears in the browser address bar as the final part of the URL when you open your course in Studio. For more details, see *Create a New Course*.

After creating a library and adding components to it, if you have *enabled content libraries* in your course, you can use these library components in randomized assignments in your course. You do this by adding a randomized content block to a course unit and specifying the name of the library from which the randomized content is to drawn. You also specify the number and type of problems that each learner is assigned. For information about randomized content blocks, see *Randomized Content Blocks*.

Libraries have separate users and levels of access from courses. Initially, only the person who created the library has access. She can add other users to the library. For details, see *Give Other Users Access to Your Library*. The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page.

6.5.2 Create a New Library

Use *content libraries* to build a pool of components that can be used in randomized assignments in your courses.

To create a new library, follow these steps.

1. Log in to Studio.

2. Select **New Library**.

3. Enter the required information for your new library, then select **Create**.

Note: Enter new library information carefully. The values in these fields become part of the URL for your library, therefore the total number of characters in the **Library Name**, **Organization**, and **Library Code** fields must be 65 or fewer.

- For **Library Name**, enter the public display name for your library. Choose a meaningful name that will help you and other course team members to identify the library. For example, "Level 200 Math Problems". When you add a randomized content block to a course unit, you use the library name to specify this library as a source for the randomized assignment.

- For **Organization**, enter the identifier for your university. For example, enter HarvardX or MITx. Do not include spaces or special characters.

- For **Library Code**, enter an identifier for your library that is unique within your organization. This code becomes part of the URL for your library, so do not include spaces or special characters in the code.

---

4. Select **Create**.

You see the new library, to which you can now add components. For information about adding components to a library, see *Add Components to a Library*.

After you create a library, you are automatically assigned an **Admin** role for the library. For information about adding other users to a library after you create it, see *Give Other Users Access to Your Library*.

6.5.3 Edit a Library

After you create a library, the only change you can make to the initial library information is to the name. However, at any time, you can make changes to the components in your library, including adding or deleting components or editing the settings of components. For details about editing the contents of a library, see *Edit Components in a Library* and *Add Components to a Library*.

To change the name of a library, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library whose name you want to edit.

3. Select the **Edit** icon next to the library name.

    The library name field becomes editable.
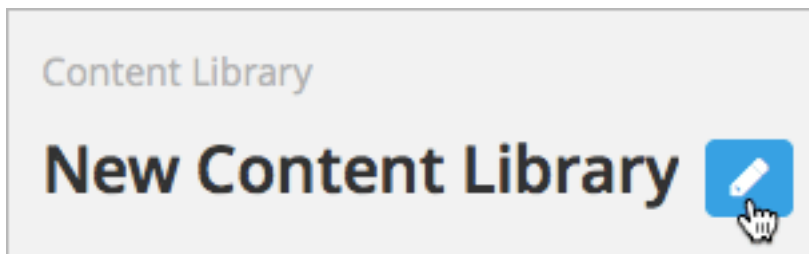
4. In the library name field, make edits or enter a new library name.

5. Select anywhere outside the library name field to save your changes.

For details about giving other users access to the library, see *Give Other Users Access to Your Library*.

6.5.4 Add Components to a Library

To add new *components* to your library, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library that you want to add components to.

3. Select **Add Component**, then select the component type that you want to add under **Add New Component**.

For more information about the types of components you can add to a library, see these topics.

- *Working with HTML Components*
- *Working with Problem Components*
- *Working with Video Components*

After you add a component to a library, you can edit its settings. These settings are retained when the component is selected from the library and used in a course.

When a component from the library is used in a randomized content block, you can further edit the component as it exists in the unit, without affecting the original version in the library. For details, refer to *Edit Components in a Library* and *Getting the Latest Version of Library Content*.

6.5.5 View the Contents of a Library

To view the entire contents of a library in Studio, follow these steps.

1. Log in to Studio.

2. Select **Libraries**, then select the library whose components you want to view.

3. Optionally, select **Hide Previews** at the top right of the library page to collapse the component previews and see only the list of component display names. To return to the full preview of components in the library, select **Show Previews**.

The components in the library are shown in the order in which they were added, with the most recently added at the bottom. If your library has more than 10 components, additional components are shown on other pages.

The range of the components shown on the current page, and the total number of components, are shown at the top of the page.

You can navigate through the pages in the following ways.

- Use the **<** and **>** buttons at the top and bottom of the list to navigate to the previous and next pages.

- At the bottom of the page, you can edit the first number in the page range. Select the number to place your cursor in the field, then enter the page number you want to jump to.

To view the list of matching components in the library, see *View the Matching Components in a Randomized Content Block*.

To view the randomized content that was assigned to a specific learner, see *Specific Student View*.

6.5.6 Edit Components in a Library

After you have added components to a library, you can edit, duplicate, or delete them.

For step-by-step instructions for editing, duplicating, or deleting components, refer to the following topics.

- *Edit a Component*

- *Duplicate a Component*

- *Delete a Component*

Note: If you modify components in your library that are in use in a course, these updates in the "source" library are not reflected in the course unless you manually update the randomized content block in the course unit. For details about updating library components used in your course to match the latest version in the library, see *Getting the Latest Version of Library Content*.

6.5.7 Delete a Library

You cannot delete a library. Instead, you can discontinue use of an unwanted library. To do so, first make sure that none of its components are in use in any courses, then delete all components in the library. You can also *edit the name of the library* to make it clear to other course team members that the library should not be used as a source of randomized assignment content in courses.

For details about deleting components in a library, see *Edit Components in a Library*.

6.5.8 Give Other Users Access to Your Library

When you create a library, you are automatically assigned an Admin role in that library.

You can give other Studio users access to your library. Depending on the level of access that you give them in the library, additional library users can view and use library content in courses, edit library content, or add and manage other library users. All users to whom you give library access must be registered with Studio and have an active account.

These are the levels of access for libraries.

- **User** – Users can view library content and can use library components in their courses, but they cannot edit the contents of a library.

- **Staff** – Staff can use library components in their courses. In addition, as content co-authors, they have full editing privileges in a library.

- **Admin** – Admins have full editing privileges for a library. In addition, they can add and remove other team members from library access. There must be at least one user with Admin privileges in a library.

Note: The levels of access for libraries are hierarchical. You can add new library members only with the **User** level of access, after which you can give them the **Staff** level of access. You can give the **Admin** level of access only to people who already have the **Staff** level of access.

Add a User to the Library

To grant a user initial **User** access to a library, follow these steps.

Note: Only library users with the **Admin** level of access can add users to the library.

1. Ensure that the new library member has an active Studio account.

2. On the Studio home page, select the **Libraries** tab and locate the library to which you are adding this user.

3. From the **Settings** menu select **User Access**.

4. On the **User Access** page, select **Add a New User**.

5. Enter the new user's email address, then select **ADD USER**.

    The new user is added to the list of library members with the **User** level of access.

Remove a User from the Library

You can remove users from the library at any time, regardless of the level of access that they have.

To remove a user from the library, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user that you want to remove.

4. Hover over the user's box and select the trash can icon.

   You are prompted to confirm the deletion.

5. Select **Delete**.

   The user is removed from the library.

Add Staff or Admin Access

The levels of access for libraries are hierarchical. You can add new library members only with the **User** level of access, after which you can give them the **Staff** level of access. You can give the **Admin** level of access only to people who already have the **Staff** level of access.

To give a library member a higher level of access to the library, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user to whom you are giving additional privileges.

   • If he currently has **User** access, select **Add Staff Access**.

   • If he currently has **Staff** access, select **Add Admin Access**.

   The user's display listing is updated to indicate the new level of access. In addition, their listing now includes a button to remove their current level of access and move them back to their previous level of access. For details about reducing a user's level of access to a library, see *Remove Staff or Admin Access*.

Remove Staff or Admin Access

After you have granted users **Staff** or **Admin** access, you (or other **Admin** library users) can reduce their levels of access.

To remove **Staff** or **Admin** access from a library user, follow these steps.

1. In Studio, select the **Libraries** tab and locate your library.

2. From the **Settings** menu select **User Access**.

3. On the **User Access** page, locate the user whose access level you are changing.

   • If she currently has **Staff** access, select **Remove Staff Access**.

   • If she currently has **Admin** access, select **Remove Admin Access**.

     The user's display listing is updated to indicate the new role.

Note: There must always be at least one Admin for a library. If there is only one user with the Admin role, you cannot remove him or her from the Admin role unless you first assign another user to the Admin role.

6.5.9 Exporting and Importing a Library

You can *export* and *import* a content library in Studio.

Export a Library

There are several reasons why you might want to export your library.

- To save your work in progress

- To edit the XML in your library directly

- To create a backup copy of your library

- To share with another course team member

When you export your library, Studio creates a **.tar.gz** file (that is, a .tar file compressed using GNU Zip). This export file contains the problems in the library, including any customizations you made in the library to problem settings. The export does not include library settings such as user access permissions.

To export a library, follow these steps.

1. In Studio, select the **Libraries** tab.

2. Locate the library that you want to export.

3. From the **Tools** menu, select **Export**.

4. Select **Export Library Content** and specify where you want the file to be saved.

When the export process finishes, you can access the .tar.gz file on your computer.

Import a Library

You might want to import a library if you developed or updated library content outside of Studio, or if you want to overwrite a problematic or outdated version of the library.

> **Warning:** When you import a library, the imported library completely replaces the existing library and its contents. You cannot undo a library import. Before you proceed, we recommend that you export the current library, so that you have a backup copy of it.

The library file that you import must be a .tar.gz file (that is, a .tar file compressed using GNU Zip). This .tar.gz file must contain a library.xml file.

To import a library, follow these steps.

1. In Studio, select the **Libraries** tab.

2. Locate the library to which you want to import the new library content.

3. From the **Tools** menu, select **Import**.

4. Select **Choose a File to Import** and select the .tar.gz file that you want to import.

5. Select **Replace my library with the selected file**.

> **Warning:** The import process has five stages. During the first two stages (Uploading and Unpacking), do not navigate away from the **Library Import** page. Doing so causes the import process to end. You can leave the page only after the Unpacking stage completes. We recommend that you do not make important changes to the library until all stages of the import process have finished.

6. When the import process finishes, select **View Updated Library** to view the imported library.

Note: If your imported library includes changes to components that are in use in a course, the course does not reflect these library updates until you manually update the randomized content block in the course unit. For details about updating library components used in your course to match the latest version in the content library, see *Getting the Latest Version of Library Content*.

Creating Exercises and Tools

Use the chapters in this section to understand how to create exercises and tools in your course.

For information on how to develop your course content in the Studio Outline page, see *Developing Your Course*.

For information on building specific course component types, see *Creating Course Content*.

7.1 Creating Exercises and Tools

- *Introduction to Exercises and Tools*
- *General Exercises and Tools*
- *Image-Based Exercises and Tools*
- *Multiple Choice Exercises and Tools*
- *STEM Exercises and Tools*

7.1.1 Introduction to Exercises and Tools

Studio allows you to create a wide variety of exercises and tools for your course. Many of these exercises and tools have templates in Studio to help you create exercises. In addition, individual course teams frequently create exercises that don't have templates in Studio.

Note: The level of support that edX provides for each tool varies. Exercises and tools that are not fully supported by edX are flagged with an indicator of either provisional or no support.

Exercises and tools with provisional support might lack the robustness of functionality that courses you build using edX require. Exercises and tools with no support are not maintained by edX, and might be deprecated in the future.

Depending on the exercise or tool, you use an HTML, problem, or advanced component. The page for each individual exercise or tool contains an example of each exercise or tool, together with all the files, code, and step-by-step instructions that you need to create the exercise or tool.

Note: When you create problems, you must include labels for accessibility. Accessible labels generally include the text of the main question in your problem. Instructions for adding labels appear in the page for each individual problem.

7.1.2 General Exercises and Tools

Type	Description	Support
Annotation Problem	Annotation problems ask students to respond to questions about a specific block of text. The question appears above the text when the student hovers the mouse over the highlighted text so that students can think about the question as they read.	Provisional support
Conditional Module	You can create a conditional module to control versions of content that groups of students see. For example, students who answer "Yes" to a poll question then see a different block of text from the students who answer "No" to that question.	Provisional support
Custom JavaScript Problem	Custom JavaScript display and grading problems (also called *custom JavaScript problems* or *JS Input problems*) allow you to create a custom problem or tool that uses JavaScript and then add the problem or tool directly into Studio.	Full support
External Grader	An external grader is a service that receives student responses to a problem, processes those responses, and returns feedback and a problem grade to the edX platform. You build and deploy an external grader separately from the edX platform. An external grader is particularly useful for software programming courses where students are asked to submit complex code.	Provisional support
Google Calendar Tool	You can embed a Google calendar in your course so that students see the calendar in the courseware. You can use a Google calendar to share quiz dates, office hours, or other schedules of interest to students.	Full support
Google Drive Files Tool	You can embed a Google Drive file, such as a document, spreadsheet, or image, in your course so that students see the file in the courseware.	Full support
Google Instant Hangout Tool	You can add the ability for students to participate in instant hangouts directly from your course. With instant hangouts, students can interact through live video and voice, share screens and watch videos together, and collaborate on documents.	Provisional support
IFrame Tool	IFrames allow you to integrate ungraded exercises and tools from any Internet site into an HTML component in your course.	Provisional support
LTI Component	LTI components allow you to add an external learning application or non- PDF textbook to Studio.	Full support
Open Response Assessments	In open response assessments, students receive feedback on written responses of varying lengths as well as image files that the students upload. Open response assessments include self assessment and peer assessment.	Full support
Poll Tool	You can include polls in your course to gather learners' opinions on various questions. You can use the Poll Tool in Studio.	Full support
Poll Tool for OLX	You can run polls in your course so that your students can share opinions on different questions. You can use this type of poll only in OLX, not Studio.	Provisional support
Problem with Adaptive Hint	A problem with an adaptive hint evaluates a student's response, then gives the student feedback or a hint based on that response so that the student is more likely to answer correctly on the next attempt. These problems can be text input or multiple choice problems.	Provisional support
Problem Written in LaTeX	If you have a problem that is already written in LaTeX, you can use this problem type to easily convert your code into XML.	No support
Qualtrics Survey Tool	You can import surveys that you have created in Qualtrics. The survey appears inside an IFrame in your course.	Full support
Survey Tool	You can include surveys in your course to collect learner responses to multiple questions. You can use the Survey Tool in Studio.	Full support
Text Input Problem	In text input problems, students enter text into a response field. The response can include numbers, letters, and special characters such as punctuation marks.	Full support
Word Cloud Tool	Word clouds arrange text that students enter - for example, in response to a question - into a colorful graphic that students can see.	Provisional support
Write-Your-Own-Grader Problem	In custom Python-evaluated input (also called "write-your-own-grader") problems, the grader uses a Python script that you create and embed in the problem to evaluates a student's response or provide hints. These problems can be any type.	Provisional support
Recommender	RecommenderXBlock can hold a list of resources for misconception remediation,	Provi-

7.1.3 Image-Based Exercises and Tools

Type	Description	Support
Drag and Drop Problem	In drag and drop problems, students respond to a question by dragging text or objects to a specific location on an image.	Provisional support
Full Screen Image Tool	The Full Screen Image tool allows a student to enlarge an image in the whole browser window. This is useful when the image contains a large amount of detail and text that is easier to view in context when enlarged.	Full support
Image Mapped Input Problem	In an image mapped input problem, students click inside a defined area in an image. You define this area by including coordinates in the body of the problem.	Provisional support
Zooming Image Tool	Zooming images allow you to enlarge sections of an image so that students can see the section in detail.	Full support

7.1.4 Multiple Choice Exercises and Tools

Type	Description	Support
Checkbox Problem	In checkbox problems, the student selects one or more options from a list of possible answers. The student must select all the options that apply to answer the problem correctly.	Full support
Dropdown Problem	Dropdown problems allow the student to choose from a collection of answer options, presented as a dropdown list. Unlike multiple choice problems, whose answers are always visible directly below the question, dropdown problems don't show answer choices until the student clicks the dropdown arrow.	Full support
Multiple Choice Problem	In multiple choice problems, students select one option from a list of answer options. Unlike with dropdown problems, whose answer choices don't appear until the student clicks the drop-down arrow, answer choices for multiple choice problems are always visible directly below the question.	Full support
Multiple Choice and Numerical Input Problem	You can create a problem that combines a multiple choice and numerical input problems. Students not only select a response from options that you provide, but also provide more specific information, if necessary.	Provisional support

7.1.5 STEM Exercises and Tools

Type	Description	Support
Chemical Equation Problem	Chemical equation problems allow the student to enter text that represents a chemical equation into a text box. The grader evaluates the student's response by using a Python script that you create and embed in the problem.	Full support
Circuit Schematic Builder Problem	In circuit schematic builder problems, students can arrange circuit elements such as voltage sources, capacitors, resistors, and MOSFETs on an interactive grid. They then submit a DC, AC, or transient analysis of their circuit to the system for grading.	Provisional support
Gene Explorer Tool	The Gene Explorer (GeneX) simulates the transcription, splicing, processing, and translation of a small hypothetical eukaryotic gene. GeneX allows students to make specific mutations in a gene sequence, and it then calculates and displays the effects of the mutations on the mRNA and protein.	Provisional support
Math Expression Input Problems	The more complex of Studio's two types of math problems. In math expression input problems, students enter mathematical expressions to answer a question. These problems can include unknown variables and more complex symbolic expressions. You can specify a correct answer either explicitly or by using a Python script.	Full support
Molecule Editor Tool	The molecule editor allows students to draw molecules that follow the rules for covalent bond formation and formal charge, even if the molecules are chemically impossible, are unstable, or do not exist in living systems.	No support
Molecule Viewer Tool	The molecule viewer allows you to create three-dimensional representations of molecules for students to view.	No support
Numerical Input Problem	The simpler of Studio's two types of math problems. In numerical input problems, students enter numbers or specific and relatively simple mathematical expressions to answer a question. These problems only allow integers and a few select constants. You can specify a margin of error, and you can specify a correct answer either explicitly or by using a Python script.	Full support
Periodic Table Tool	An interactive periodic table of the elements shows detailed information about each element as the student moves the mouse over the element.	No support
Protex Protein Builder Tool	The Protex protein builder asks students to create specified protein shapes by stringing together amino acids.	No support

7.1.6 Mobile-Ready Problem Types

Learners can read and submit answers for the following types of problems while they use the edX mobile app.

- *Checkbox Problem*
- *Dropdown Problem*
- *Multiple Choice Problem*
- *Numerical Input Problem*
- *Text Input Problem*

Questions that have other problem types do not appear in the edX mobile app. Instead, a message appears with a link to open the applicable problem component in a web browser.

7.2 Annotation Problem

In an annotation problem, you highlight specific text inside a larger text block and then ask questions about that text. The questions appear when students move their cursors over the highlighted text. The questions also appear in a section below the text block, along with space for students' responses.

Instructions

Annotation Exercise, Hour 12 (to be done after the Hour 12 Question Set has been completed). Carefully read the following text and answer the accompanying question. To see the question while you read the text, hover your mouse over the highlighted selection in the text below.

Guided Discussion Hide Annotations

This exercise first appeared in HarvardX's CB22x: The Ancient Greek Hero course, spring 2013.

|122 And they [= the Golden Generation of humankind] are superhumans [daimones]. They exist because of the Will of Zeus. |123 They are the good, the earthbound [epi-khthonioi], the guardians of mortal humans. |124 They guard acts of justice [dikē] and they guard against wretched acts of evil. |125 Enveloped in mist, they roam everywhere throughout the earth. |126 They are givers of prosperity. And they had this as a privilege [geras], a kingly one [basilēion].

QUESTION 1 (2/2 points)

Annotation Exercise Return to Annotation ↑

|124 They guard acts of justice [dikē] and they guard against wretched acts of evil.

Hesiodic poetry declares that heroes are protectors of justice. Is this declaration consistent with what we have read in Homeric poetry?

Type your response below:

In your response to this question, which tag below do you choose?

This declaration in Hesiodic poetry is inconsistent with Homeric poetry, since we see that heroes in the Iliad and Odyssey do in fact engage in unjust as well as just actions.

✓ This declaration in Hesiodic poetry is consistent with Homeric poetry, since there is no real contradiction here between the two kinds of poetry.

We cannot be sure whether this declaration in Hesiodic poetry is consistent or inconsistent with Homeric poetry, where the actions of heroes are not evaluated in terms of injustice or justice.

Answer: This declaration in Hesiodic poetry is consistent with Homeric poetry, since there is no real contradiction here between the two kinds of poetry.

If you answered "This declaration in Hesiodic poetry is inconsistent with Homeric poetry, since we see that heroes in the Iliad and Odyssey do in fact engage in unjust as well as just actions," you would be missing ... heroes in the Iliad and Odyssey are still alive when they are engaged in their actions. By contrast, the heroes of the Golden Age are not of this world when they are protecting justice. Enveloped in mist and roaming throughout the earth, the heroes of the Golden Age are pictured as otherworldly spirits. This picture corresponds to the idea of cult heroes, not to the idea of epic heroes. If you answered "We

7.2. Annotation Problem **219**

7.2.1 Create an Annotation Problem

To create an annotation problem, you add the Annotation advanced component to your course, add the **Instructions** and **Guided Discussion** segments of the problem, and then the **Annotation problem** segment of the problem.

Add the Annotation Component

To add the Annotation advanced component, follow these steps.

1. From the **Settings** menu select **Advanced Settings**.

2. In the field for the **Advanced Module List** policy key, place your cursor between the brackets.

3. Enter the following value. Make sure to include the quotation marks.

   ```
   "annotatable"
   ```

4. At the bottom of the page, select **Save Changes**.

   The page refreshes automatically. At the top of the page, you see a notification that your changes have been saved.

5. Return to the unit where you want to add the specialized problem. The list of possible components now contains an Advanced component.
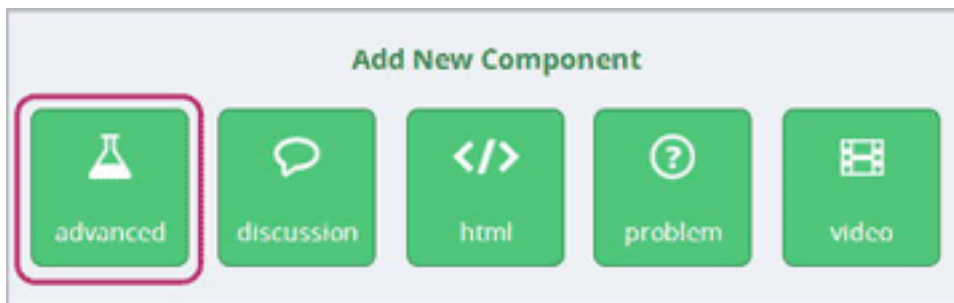
Add Instructions and Guided Discussion

To add the **Instructions** and **Guided Discussion** segments of the problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Advanced**.

2. In the list of problem types, select **Annotation**.

3. In the component that appears, select **Edit**.

4. In the component editor, replace the example code with your own code.

5. Select **Save**.

Add Annotation Problem

To add the **Annotation problem** segment of the problem, follow these steps.

1. Under the Annotation component, create a new blank Advanced Problem component.

2. Paste the following code in the Advanced Problem component, replacing placeholders with your own information.

```
<problem>
    <annotationresponse>
        <annotationinput>
          <text>PLACEHOLDER: Text of annotation</text>
            <comment>PLACEHOLDER: Text of question</comment>
            <comment_prompt>PLACEHOLDER: Type your response below:</comment_prompt>
            <tag_prompt>PLACEHOLDER: In your response to this question, which tag below do you c
          <options>
            <option choice="incorrect">PLACEHOLDER: Incorrect answer (to make this option a corr
            <option choice="correct">PLACEHOLDER: Correct answer (to make this option an incorre
            <option choice="partially-correct">PLACEHOLDER: Partially correct answer (to make th
            </option>
          </options>
        </annotationinput>
    </annotationresponse>
    <solution>
      <p>PLACEHOLDER: Detailed explanation of solution</p>
    </solution>
  </problem>
```

3. Select **Save**.

7.3 Checkbox Problem

Topic Contents

- *Overview*
- *Analyzing Performance on Checkbox Problems*
- *Creating a Checkbox Problem*
- *Use Feedback in a Checkbox Problem*
- *Use Hints in a Checkbox Problem*
- *Checkbox Problem XML*

7.3.1 Overview

In checkbox problems, learners select one or more options from a list of possible answers. To answer the problem correctly, a learner must select all of the options that apply. Each checkbox problem must have at least one correct answer.

7.3.2 Analyzing Performance on Checkbox Problems

For the checkbox problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

Note: On checkbox problems, make sure the all of the choices are unambiguous, and avoid trick questions. Checkbox problems with ambiguity can be frustrating to students, especially if they have a limited number of attempts.

7.3.3 Creating a Checkbox Problem

You can create checkbox problems in the Simple Editor or in the Advanced Editor. You can set up a problem in the Simple Editor, and then switch to the Advanced Editor to add more configuration options in XML. However, you cannot switch back to the Simple Editor from the Advanced Editor. Therefore, you might want to format the problem as completely as possible before you begin to use the Advanced Editor.

Use the Simple Editor to Create a Checkbox Problem

To use the *Simple Editor* to create a checkbox problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select one of the two checkbox problem templates.

   - From the list of **Common Problem Types**, select **Checkboxes**.

   - From the list of **Common Problems with Hints and Feedback**, select **Checkboxes with Hints and Feedback**. For more information, see *Use Feedback in a Checkbox Problem*.

   Studio adds the checkbox problem to the unit.

3. Select **Edit**. The Simple Editor opens.

4. Replace the sample problem text with your own text.

5. Determine the text that describes the question you want learners to answer, and surround that text with two pairs of angle brackets (>>question<<). This question text is the accessible label for the problem.

6. Edit the text to place each answer option on a separate line.

7. Select the set of answer options, and then select **Checkboxes** from the toolbar. A pair of brackets appears next to each answer choice.

8. To identify each correct answer, add an **x** between the brackets for that option.

9. To provide an explanation, select the explanation text and then select **Explanation** from the toolbar. [explanation] appears before and after the explanation text.

10. Select **Settings** and provide an identifying **Display Name** for the problem.

11. Define additional settings for the problem. For more information, see *Problem Settings*.

12. Select **Save**.

For the example problem illustrated above, the following text displays in the problem component.

```
Learning about the benefits of preventative healthcare can be particularly
difficult. >>Check all of the reasons below why this may be the case.<<

[x] A large amount of time passes between undertaking a preventative measure and seeing the result.
[ ] Non-immunized people will always fall sick.
[x] If others are immunized, fewer people will fall sick regardless of a particular individual's cho
[x] Trust in healthcare professionals and government officials is fragile.
```

Use the Advanced Editor to Edit a Checkbox Problem

To use the *Advanced Editor* to edit a checkbox problem, follow these steps.

1. Follow the steps for creating the problem in the *Simple Editor*.

2. Select **Advanced Editor**, and then edit the XML to add the tags and attributes you want. An example follows.

```
<problem>
<p>Learning about the benefits of preventative healthcare can be particularly difficult. Check all o

<choiceresponse>
  <checkboxgroup label="Check all of the reasons below why this may be the case">
    <choice correct="true"><text>A large amount of time passes between undertaking a preventative mea
    <choice correct="false"><text>Non-immunized people will always fall sick.</text></choice>
    <choice correct="true"><text>If others are immunized, fewer people will fall sick regardless of a
```

```
    <choice correct="true"><text>Trust in healthcare professionals and government officials is fragi
  </checkboxgroup>
</choiceresponse>

<solution>
  <div class="detailed-solution">
    <p>Explanation</p>
    <p>People who are not immunized against a disease may still not fall sick from the disease. If so
  </div>
</solution>
</problem>
```

7.3.4 Use Feedback in a Checkbox Problem

You can add feedback in a checkbox problem using the simple editor or the advanced editor. For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*.

In checkbox problems, you can provide feedback for each option that a learner can select, with distinct feedback depending on whether or not the learner selects that option. This means that there are four possible types of feedback.

- The learner selects a correct option. This type of feedback should indicate why the option is correct.

- The learner does not select a correct option. This type of feedback should indicate that the learner missed checking this option and why it is correct.

- The learner selects an incorrect option. This type of feedback should indicate that the learner incorrectly checked this option and why it is incorrect

- The learner does not select an incorrect option. This type of feedback should reinforce why the learner correctly left this option unselected.

Compound Feedback

You can configure the checkbox problem to provide compound feedback. Compound feedback is feedback given for a specific combination of options. For example, if you have three possible option in the problem, you can define specific feedback for when a learner selects each combination of possible options.

- A
- B
- C
- A, B
- B, C
- A, C
- A, B, C

For problems with more than three options, providing specific feedback for each combination can become difficult. For such problems, you can define compound feedback for more likely combinations of option or for combinations of option that reflect common learner misunderstandings. If you do not define feedback for a combination that a learner selects, the learner receives feedback for the individual selections.

Configure Feedback in the Simple Editor

You can configure individual option and compound feedback in the *Simple Editor*. When you create a new checkbox problem, select the template **Checkboxes with Hints and Feedback**. This template has example feedback syntax that you can replace.

Configure Feedback for Individual Options

In the simple editor, you configure individual option feedback with the following syntax.

```
[x] answer  {{ selected: Feedback when learner selects this option. },
{unselected: Feedback when the learner does not select this option.}}
```

Note: You can use `S` for `selected` and `U` for unselected.

For example, the following problem has feedback for each option.

```
>>Which of the following is an example of a fruit? Check all that apply.<<

[x] apple  {{ selected: You are correct that an apple is a fruit because it
is the fertilized ovary that comes from an apple tree and contains seeds. },
{ unselected: Remember that an apple is also a fruit.}}

[x] pumpkin {{ selected: You are correct that a pumpkin is a fruit because it
is the fertilized ovary of a squash plant and contains seeds.}, { unselected:
Remember that a pumpkin is also a fruit.}}

[ ] potato   {{ U: You are correct that a potato is a vegetable because it is
an edible part of a plant in tuber form.}, { S: A potato is a vegetable, not
a fruit, because it does not come from the flower on a plant or tree and does
not contain seeds.}}

[x] tomato  {{ S: You are correct that a tomato is a fruit because it is the
fertilized ovary of a tomato plant and contains seeds. }, { U: Many people
mistakenly think a tomato is a vegetable. However, because a tomato is the
fertilized ovary of a tomato plant and contains seeds it is classified as a
fruit.}}
```

Configure Compound Feedback

In the simple editor, you configure compound feedback after the possible options, with the following syntax.

```
{{ ((Answer Combination)) Feedback when learner selects this combination of
options.}}
```

For example, the following compound feedback is used when learners select options **A, B, and D** or **A, B, C, and D**.

```
{{ ((A B D)) An apple, pumpkin, and tomato are all fruits as they are all the
fertilized ovaries of a plant and contain seeds. }}

{{ ((A B C D)) You are correct that an apple, pumpkin, and tomato are all
fruits as they are all the fertilized ovaries of a plant and contain seeds.
However, a potato is not a fruit as it is an edible part of a plant in tuber
form and is classified as a vegetable.  }}
```

Configure Feedback in the Advanced Editor

You can configure individual option and compound feedback in the *Advanced Editor*.

Configure Individual Option Feedback

In the advanced editor, you configure individual option feedback with the following syntax.

```
<choice correct="true">Choice label
  <choicehint selected="true">
    Feedback for when learner selects this answer.
  </choicehint>
  <choicehint selected="false">
    Feedback for when learner does not select this answer.
  </choicehint>
</choice>
```

For example, the following problem has feedback for each option.

```
<choiceresponse>
  <checkboxgroup label="Which of the following is an example
of a fruit? Check all that apply." direction="vertical">
    <choice correct="true">apple
      <choicehint selected="true">You are correct that an apple is a fruit
        because it is the fertilized ovary that comes from an apple tree and
        contains seeds.
      </choicehint>
      <choicehint selected="false">Remember that an apple is also a
        fruit.
      </choicehint>
    </choice>
    <choice correct="true">pumpkin
      <choicehint selected="true">You are correct that a pumpkin is a fruit
        because it is the fertilized ovary of a squash plant and contains
        seeds.
      </choicehint>
      <choicehint selected="false">Remember that a pumpkin is also a
        fruit.
      </choicehint>
    </choice>
    <choice correct="false">potato
      <choicehint selected="true">A potato is a vegetable, not a fruit,
        because it does not come from the flower on a plant or tree and does
        not contain seeds.
      </choicehint>
      <choicehint selected="false">You are correct that a potato is
        classified as a vegetable because it is an edible part of a plant in
        tuber form.
      </choicehint>
    </choice>
    <choice correct="true">tomato
      <choicehint selected="true">You are correct that a tomato is
        classified as a fruit because it is the fertilized ovary of a tomato
        plant and contains seeds.
      </choicehint>
      <choicehint selected="false">Many people mistakenly think a tomato is
        a vegetable. However, because a tomato is the fertilized ovary of a
        tomato plant and contains seeds it is classified as a fruit.
```

```
        </choicehint>
    </choice>
  </checkboxgroup>
</choiceresponse>
```

Configure Compound Feedback

In the advanced editor, you define compound feedback in the `<compoundhint>` element within the `<checkboxgroup>` element.

```
<compoundhint value="Answer Combination">
  Feedback when learner selects this combination of answers.
</compoundhint>}}
```

For example, the following compound feedback is used when learners select options **A, B, and D** or **A, B, C, and D**.

```
<compoundhint value="A B D">An apple, pumpkin, and tomato are all fruits as
  they all are fertilized ovaries of a plant and contain seeds.
</compoundhint>
<compoundhint value="A B C D">You are correct that an apple, pumpkin, and
  tomato are all fruits as they all are fertilized ovaries of a plant and
  contain seeds. However, a potato is not a fruit as it is an edible part of
  a plant in tuber form and is classified as a vegetable.
</compoundhint>
```

7.3.5 Use Hints in a Checkbox Problem

You can add hints to a checkbox problem, using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you configure each hint in the `<hint>` element within the `<demandhint>` element.

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
```

For example, the following XML shows two hints.

```
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
```

7.3.6 Checkbox Problem XML

Template

```
<problem>
<legend>Question text</legend>
<choiceresponse>
  <checkboxgroup label="label text">
    <choice correct="false">
      Answer option A (incorrect)
      <choicehint selected="true">
        Feedback for when learner selects this answer.
      </choicehint>
      <choicehint selected="false">
        Feedback for when learner does not select this answer.
      </choicehint>
    </choice>
    <choice correct="true">
      Answer option B (correct)
      <choicehint selected="true">
        Feedback for when learner selects this answer.
      </choicehint>
      <choicehint selected="false">
        Feedback for when learner does not select this answer.
      </choicehint>
    </choice>
    <choice correct="false">
      Answer option C (correct)
      <choicehint selected="true">
        Feedback for when learner selects this answer.
      </choicehint>
      <choicehint selected="false">
        Feedback for when learner does not select this answer.
      </choicehint>
    </choice>
    <compoundhint value="A B">
      Feedback when answers A and B are selected.
    </compoundhint>
   <compoundhint value="A C">
      Feedback when answers A and C are selected.
    </compoundhint>
  </checkboxgroup>
</choiceresponse>
```

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>

<solution>
  <div class="detailed-solution">
    <p>Solution or Explanation Heading</p>
    <p>Solution or explanation text</p>
  </div>
</solution>
</problem>
```

Tags

- `<choiceresponse>` (required): Specifies that the problem contains options for learners to choose from.

- `<checkboxgroup>` (required): Specifies that the problem is a checkbox problem.

- `<compoundhint>` (optional): Specifies feedback for a specific combination of answers.

- `<choice>` (required): Designates an answer option.

- `<demandhint>` (optional): Specifies hints for the learner.

Tag: `<choiceresponse>`

Specifies that the problem contains options for learners to choose from.

> Attributes
>
> (none)
>
> Children
>
> `<checkboxgroup>`

Tag: `<checkboxgroup>`

Specifies that the problem is a checkbox problem.

> Attributes

Attribute	Description
label (required)	Specifies the name of the response field.

> Children
>
> `<choice>` `<compoundhint>`

Tag: `<choice>`

Designates an answer option.

> Attributes

Attribute	Description
true (at least one required)	Indicates a correct answer. For checkbox problems, one or more `<choice>` tags can contain a correct answer.
false (at least one required)	Indicates an incorrect answer.

> Children

```
<choicehint>
```

Tag: `<choicehint>`

Specifies a hint for the answer option.

Attributes

Attribute	Description
selected (required)	`true` or `false`. Indicates if the hint is given when the answer option is selected, or when it is not selected.

Children

(none)

Tag: `<compoundhint>`

Designates feedback for a specific combination of answers.

Attributes

Attribute	Description
value (at least one required)	Indicates which combination of selected answers triggers this feedback.

Children

(none)

Tag: `<demandhint>`

Specifies hints available to the learner.

Children

`<hint>`

Tag: `<hint>`

Specifies a hint available to the learner.

Children

(none)

7.4 Chemical Equation Problem

The chemical equation problem type allows the student to enter text that represents a chemical equation into a text box. The system converts that text into a chemical equation below the text box. The grader evaluates the student's response by using a Python script that you create and embed in the problem.

CHEMICAL EQUATION PROBLEM (1 point possible)

Some problems may ask for a particular chemical equation. Practice by writing out the following reaction in the box below.

$$H_2SO_4 \longrightarrow H^+ + HSO_4^-$$

H2SO4 -> H^+ + HSO4^-|

$$H_2SO_4 \rightarrow H^+ + HSO_4^-$$

Some tips:

- Use real element symbols.
- Create subscripts by using plain text.
- Create superscripts by using a caret (^).
- Create the reaction arrow ($\longrightarrow$) by using "->".

SOLUTION

To create this equation, enter the following:

H2SO4 -> H^+ + HSO4^-

Check   Save   Hide Answer(s)   *You have used 0 of 10 submissions*

7.4.1 Create the Chemical Equation Problem

Chemical equation problems use MathJax to create formulas. For more information about using MathJax in Studio, see *A Brief Introduction to MathJax in Studio*.

To create the above chemical equation problem:

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Blank Advanced Problem**.

3. In the component that appears, click **Edit**.

4. In the component editor, paste the code from below.

5. Click **Save**.

Sample Chemical Equation Problem Code

```
<problem>
  <startouttext/>
  <p>Some problems may ask for a particular chemical equation. Practice by writing out the following

\( \text{H}_2\text{SO}_4 \longrightarrow \text { H}^+ + \text{ HSO}_4^-\)

  <customresponse>
    <chemicalequationinput size="50" label="Enter the chemical equation"/>
    <answer type="loncapa/python">

if chemcalc.chemical_equations_equal(submission[0], 'H2SO4 -> H^+ + HSO4^-'):
    correct = ['correct']
else:
    correct = ['incorrect']

    </answer>
  </customresponse>
  <p>Some tips:</p>
  <ul>
  <li>Use real element symbols.</li>
  <li>Create subscripts by using plain text.</li>
  <li>Create superscripts by using a caret (^).</li>
  <li>Create the reaction arrow (\(\longrightarrow\)) by using "->".</li>
  </ul>

  <endouttext/>

 <solution>
 <div class="detailed-solution">
 <p>Solution</p>
 <p>To create this equation, enter the following:</p>
   <p>H2SO4 -> H^+ + HSO4^-</p>
 </div>
 </solution>
</problem>
```

7.4.2 Chemical Equation Problem XML

Template

```
<problem>
  <startouttext/>
  <p>Problem text</p>

  <customresponse>
    <chemicalequationinput size="NUMBER" label="LABEL TEXT"/>
    <answer type="loncapa/python">

if chemcalc.chemical_equations_equal(submission[0], 'TEXT REPRESENTING CHEMICAL EQUATION'):
    correct = ['correct']
else:
    correct = ['incorrect']

    </answer>
```

```
  </customresponse>

  <endouttext/>

 <solution>
 <div class="detailed-solution">
 <p>Solution or Explanation Header</p>
 <p>Solution or explanation text</p>
 </div>
 </solution>
</problem>
```

Tags

- `<customresponse>`: Indicates that this problem has a custom response.

- `<chemicalequationinput>`: Specifies that the answer to this problem is a chemical equation.

- `<answer type=loncapa/python>`: Contains the Python script that grades the problem.

Tag: `<customresponse>`

Indicates that this problem has a custom response. The `<customresponse>` tags must surround the `<chemicalequation>` tags.

    Attributes

    (none)

    Children

- `<chemicalequationinput>`

- `<answer>`

Tag: `<chemicalequationinput>`

Indicates that the answer to this problem is a chemical equation and creates a response field where the student enters an answer.

    Attributes

Attribute	Description
size	Specifies the size of the response field, in characters.
label (required)	Contains the text of the principal question in the problem.

    Children

    (none)

Tag: `<answer>`

Contains the Python script that grades the problem.

    Attributes

Attribute	Description
type (required)	Must be "loncapa/python".

    Children

    (none)

7.5 Circuit Schematic Builder Problem

In circuit schematic builder problems, students can arrange circuit elements such as voltage sources, capacitors, resistors, and MOSFETs on an interactive grid. They then submit a DC, AC, or transient analysis of their circuit to the system for grading.

This exercise first appeared in MiTx's 6.002x: Circuits and Electronics course, spring 2012.

A circuit that combines two or more signals is called a *mixer*. In this lab, your goal is to build a mixer that combines the signals generated by two voltage sources, V1 and V2, where:

- V1 is a 1 kHz square wave that varies between 0V and +1V, and

- V2 is a 5 kHz sine wave that varies between -1V and +1V.

Please design a circuit that mixes V1 and V2 to produce Vout such that

$$V_{out} \approx \frac{1}{2} V_1 + \frac{1}{6} V_2.$$

The maximum value of the resulting output should be approximately $667mV$ and the minimum value should be approximately $-167mV$.

Enter your circuit below, using the appropriate configuration of resistors. Please do not modify the wiring or parameters of the voltage sources -- your goal is to take the signals they generate and combine them, not to change what is generated. Run a 5ms transient analysis to verify the correct operation of your circuit. We will be checking for the transient waveform at the "output" node.
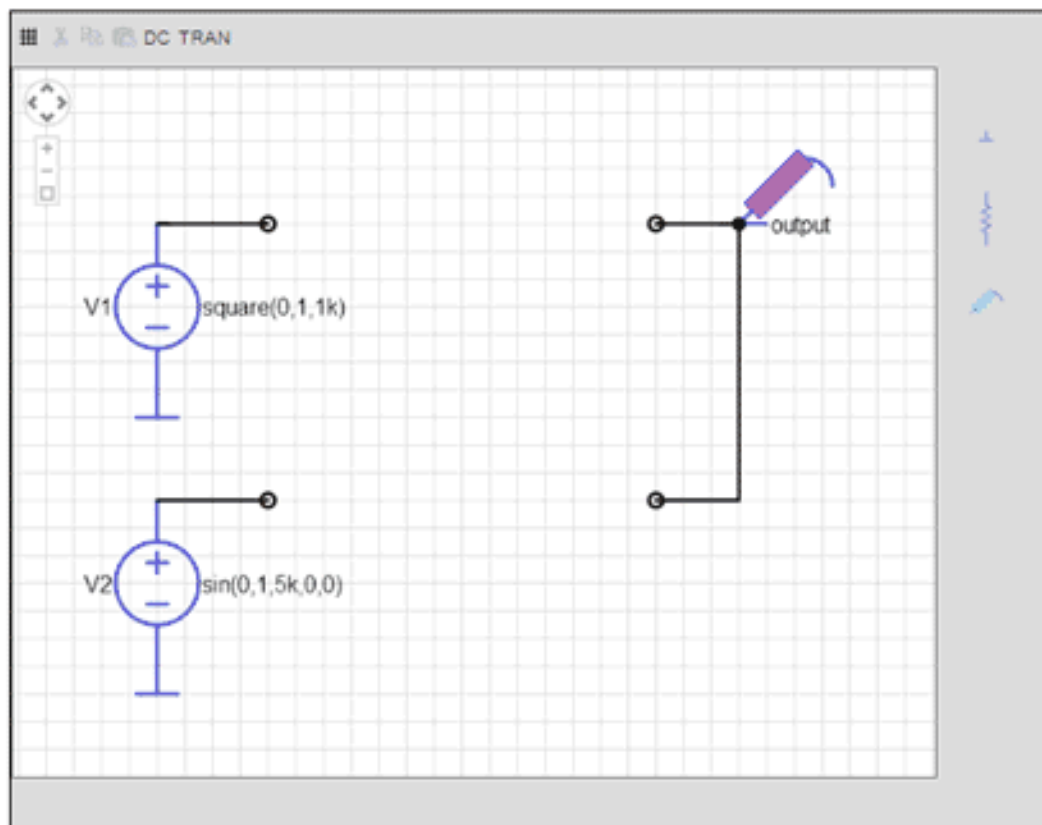
7.5.1 Create a Circuit Schematic Builder Problem

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Circuit Schematic Builder**.

3. In the component that appears, click **Edit**.

4. In the component editor, replace the example code with your own code.

5. Click **Save**.

Problem Code

To create the problem in the image above, paste the following code into the Advanced Editor.

```
<problem>
  <p>Make a voltage divider that splits the provided voltage evenly.</p>
    <schematicresponse>
    <center>
    <schematic height="500" width="600" parts="g,r" analyses="dc"
    initial_value="[["v",[168,144,0],{"value":"dc(1)","_json_":0},["1","0"]],["r",[296,120,0],{"r":'
    />
    </center>
      <answer type="loncapa/python">
    dc_value = "dc analysis not found"
    for response in submission[0]:
      if response[0] == 'dc':
          for node in response[1:]:
              dc_value = node['output']
      if dc_value == .5:
        correct = ['correct']
      else:
        correct = ['incorrect']
    </answer>
    </schematicresponse>
  <schematicresponse>
  <p>Make a high pass filter.</p>
  <center>
  <schematic height="500" width="600" parts="g,r,s,c" analyses="ac"
  submit_analyses="{"ac":[["NodeA",1,9]]}"
  initial_value="[["v",[160,152,0],{"name":"v1","value":"sin(0,1,1,0,0)","_json_":0},["1","0"]],["w'
  </center>
  <answer type="loncapa/python">
  ac_values = None
  for response in submission[0]:
    if response[0] == 'ac':
        for node in response[1:]:
            ac_values = node['NodeA']
  print "the ac analysis value:", ac_values
  if ac_values == None:
    correct = ['incorrect']
  elif ac_values[0][1] < ac_values[1][1]:
    correct = ['correct']
  else:
    correct = ['incorrect']
  </answer>
  </schematicresponse>
      <solution>
          <div class="detailed-solution">
```

```
                <p>Explanation</p>
                <p>A voltage divider that evenly divides the input voltage can be formed with two iden
                <p><img src="/c4x/edX/edX101/asset/images_voltage_divider.png"/></p>
                <p>A simple high-pass filter without any further constaints can be formed by simply pu
                <p><img src="/c4x/edX/edX101/asset/images_high_pass_filter.png"/></p>
            </div>
        </solution>
</problem>
```

7.6 Conditional Module

7.6.1 Format description

The main tag of conditional module input is `conditional`.

```
<conditional> ... </conditional>
```

`conditional` can include any number of any xmodule tags (`html`, `video`, `poll`, etc.) or `show` tags.

conditional tag

The main container for a single instance of a conditional module. The following attributes can be specified for this tag.

```
sources - location id of required modules, separated by ';'
[message | ""] - message for case, where one or more are not passed. Here you can use variable {link}

[submitted] - map to `is_submitted` module method.
(pressing RESET button makes this function to return False.)

[correct] - map to `is_correct` module method
[attempted] - map to `is_attempted` module method
[poll_answer] - map to `poll_answer` module attribute
[voted] - map to `voted` module attribute
```

show tag

Symlink to some set of xmodules. The following attributes can be specified for this tag.

```
sources - location id of modules, separated by ';'
```

7.6.2 Example

Examples of conditional depends on poll

```
<conditional sources="i4x://MITx/0.000x/poll_question/first_real_poll_seq_with_reset" poll_answer="ma
message="{link} must be answered for this to become visible.">
    <html>
        <h2>You see this because your vote value for "First question" was "man"</h2>
    </html>
</conditional>
```

Examples of conditional depends on poll (use <show> tag)

```
<conditional sources="i4x://MITx/0.000x/poll_question/first_real_poll_seq_with_reset" poll_answer="ma
message="{link} must be answered for this to become visible.">
    <html>
        <show sources="i4x://MITx/0.000x/problem/test_1; i4x://MITx/0.000x/Video/Avi_resources; i4x:/
    </html>
</conditional>
```

Examples of conditional depends on problem

```
<conditional sources="i4x://MITx/0.000x/problem/Conditional:lec27_Q1" attempted="True">
    <html display_name="HTML for attempted problem">You see this, cause "lec27_Q1" is attempted.</htm
</conditional>
<conditional sources="i4x://MITx/0.000x/problem/Conditional:lec27_Q1" attempted="False">
    <html display_name="HTML for not attempted problem">You see this because "lec27_Q1" is not attemp
</conditional>
```

7.7 Custom JavaScript Problem
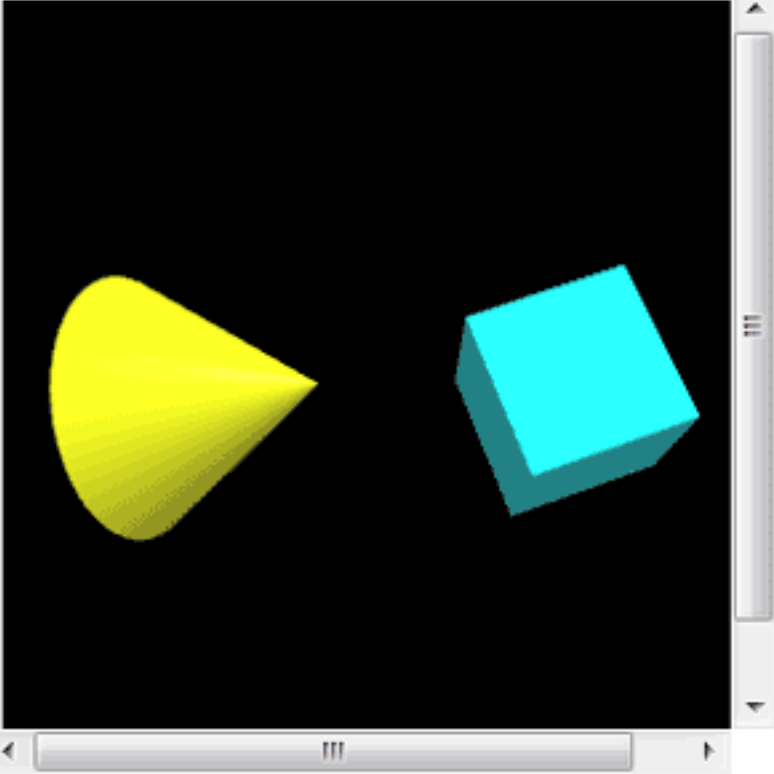
Custom JavaScript display and grading problems (also called *custom JavaScript problems* or *JS Input problems*) allow you to create a custom problem or tool that uses JavaScript and then add the problem or tool directly into Studio. When you create a JS Input problem, Studio embeds the problem in an inline frame (IFrame) so that your students can interact with it in the LMS. You can grade your students' work using JavaScript and some basic Python, and the grading is integrated into the edX grading system.

The JS Input problem that you create must use HTML, JavaScript, and cascading style sheets (CSS). You can use any application creation tool, such as the Google Web Toolkit (GWT), to create your JS Input problem.

> **Caution:** You cannot use a custom JavaScript problem in a component that contains more than one problem. Each custom JavaScript problem must be in its own component. See *Multiple Problems in One Component* for more information.

7.7.1 Create a Custom JavaScript Display and Grading Problem

1. Create your JavaScript application, and then upload all files associated with that application to the **Files & Uploads** page.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Custom JavaScript Display and Grading**.

4. In the component that appears, click **Edit**.

5. In the component editor, modify the example code according to your problem.

   - All problems have more than one element. Most problems conform to the same-origin policy (SOP), meaning that all elements have the same protocol, host, and port. For example, **http**://**store.company.com**:**81**/subdirectory_1/JSInputElement.html and **http**://**store.company.com**:**81**/subdirectory_2/JSInputElement.js have the same protocol (http), host (store.company.com), and port (81).

     If any elements of your problem use a different protocol, host, or port, you need to bypass the SOP. For example, **https**://**info.company.com**/JSInputElement2.html uses a different protocol, host, and port. To bypass the SOP, change **sop="false"** in line 8 of the example code to **sop="true"**. For more information, see the same-origin policy page on the Mozilla Developer Network or on Wikipedia.

6. If you want your problem to have a **Save** button, click the **Settings** tab, and then set **Maximum Attempts** to a number larger than zero.

7. Click **Save**.

Re-create the Example Problem

To re-create the example problem above, you'll need the following files.

- webGLDemo.html

- webGLDemo.js

- webGLDemo.css

- three.min.js

To download these files in a .zip archive, go to http://files.edx.org/JSInput.zip.

Note: If you need to bypass the SOP, you'll also need the **jschannel.js** file, and your webGLDemo.html file will be slightly different. To download all these files in a .zip archive, go to http://files.edx.org/JSInput_BypassSOP.zip.

---

1. Download and unpackage the files in either the JSInput.zip file or the JSInput_BypassSOP.zip file.

2. On the **Files & Uploads** page, upload all the files from the .zip file.

3. Create a new custom JavaScript display and grading problem component.

4. On the **Settings** tab, set **Maximum Attempts** to a number larger than zero.

5. In the problem component editor, replace the example code with the code below.

6. Click **Save.**

JavaScript Input Problem Code

```
<problem display_name="webGLDemo">
In the image below, click the cone.

<script type="loncapa/python">
import json
def vglcfn(e, ans):
    '''
    par is a dictionary containing two keys, "answer" and "state"
    The value of answer is the JSON string returned by getGrade
```

```
        The value of state is the JSON string returned by getState
        '''
        par = json.loads(ans)
        # We can use either the value of the answer key to grade
        answer = json.loads(par["answer"])
        return answer["cylinder"]  and not answer["cube"]
        # Or we can use the value of the state key
        '''
        state = json.loads(par["state"])
        selectedObjects = state["selectedObjects"]
        return selectedObjects["cylinder"] and not selectedObjects["cube"]
        '''
</script>
<customresponse cfn="vglcfn">
    <jsinput
        gradefn="WebGLDemo.getGrade"
        get_statefn="WebGLDemo.getState"
        set_statefn="WebGLDemo.setState"
        width="400"
        height="400"
        html_file="/static/webGLDemo.html"
    />
</customresponse>
</problem>
```

Note: When you create this problem, keep the following in mind.

- The webGLDemo.js file defines the three JavaScript functions (**WebGLDemo.getGrade**, **WebGLDemo.getState**, and **WebGLDemo.setState**).

- The JavaScript input problem code uses **WebGLDemo.getGrade**, **WebGLDemo.getState**, and **WebGLDemo.setState** to grade, save, or restore a problem. These functions must be global in scope.

- **WebGLDemo.getState** and **WebGLDemo.setState** are optional. You only have to define these functions if you want to conserve the state of the problem.

- **Width** and **height** represent the dimensions of the IFrame that holds the application.

- When the problem opens, the cone and the cube are both blue, or "unselected." When you click either shape once, the shape becomes yellow, or "selected." To unselect the shape, click it again. Continue clicking the shape to select and unselect it.

- The response is graded as correct if the cone is selected (yellow) when the user clicks **Check**.

- Clicking **Check** or **Save** registers the problem's current state.

7.7.2 JavaScript Input Problem XML

JSInput allows problem authors to turn stand-alone HTML files into problems that can be integrated into the edX platform. Since its aim is flexibility, it can be seen as the input and client-side equivalent of **CustomResponse**.

A JSInput exercise creates an IFrame in a static HTML page, and passes the return value of author-specified functions to the enclosing response type (generally **CustomResponse**). JSInput can also store and retrieve state.

Template

The following is the basic format of a JSInput problem:

```
<problem>
      <script type="loncapa/python">
def all_true(exp, ans): return ans == "hi"
      </script>
      <customresponse cfn="all_true">
          <jsinput gradefn="gradefn"
              height="500"
              get_statefn="getstate"
              set_statefn="setstate"
              html_file="/static/jsinput.html"/>
      </customresponse>
</problem>
```

The accepted attributes are:

Attribute Name	Value Type	Required	Default
html_file	URL string	Yes	None
gradefn	Function name	Yes	*gradefn*
set_statefn	Function name	No	None
get_statefn	Function name	No	None
height	Integer	No	*500*
width	Integer	No	*400*

Required Attributes

- **html_file**

  The **html_file** attribute specifies the HTML file that the IFrame will point to. The HTML file must be located in the content directory.

  The IFrame is created using the sandbox attribute. Although pop-ups, scripts, and pointer locks are allowed, the IFrame cannot access its parent's attributes.

  The HTML file must contain a **gradefn** function that the JSInput file can access. To determine whether the **gradefn** function is accessible, in the console, make sure that **gradefn** returns the right thing. When JSInput uses the **gradefn** function, *gradefn* is called with *gradefn*.call(*obj*), where **obj** is the object-part of **gradefn**. For example, if **gradefn** is **myprog.myfn**, JSInput calls **myprog.myfun.call(myprog)**. (This is to ensure "*this*" continues to refer to what *gradefn* expects.)

  Aside from that, more or less anything goes. Note that currently there is no support for inheriting CSS or JavaScript from the parent (aside from the Chrome-only **seamless** attribute, which is set to True by default).

- **gradefn**

  The **gradefn** attribute specifies the name of the function that will be called when a user clicks **Check**, and that returns the student's answer. Unless both the **get_statefn** and **set_statefn** attributes are also used, this answer is passed as a string to the enclosing response type. In the **customresponse** example above, this means **cfn** will be passed this answer as `ans`.

  If the **gradefn** function throws an exception when a student attempts to submit a problem, the submission is aborted, and the student receives a generic alert. The alert can be customised by making the exception name `Waitfor Exception`; in that case, the alert message will be the exception message.

  Important: To make sure the student's latest answer is passed correctly, make sure that the **gradefn** function is not asynchronous. Additionally, make sure that the function returns promptly. Currently the student has no indication that her answer is being calculated or produced.

Optional Attributes

- **set_statefn**

  Sometimes a problem author will want information about a student's previous answers ("state") to be saved and reloaded. If the attribute **set_statefn** is used, the function given as its value will be passed the state as a string argument whenever there is a state, and the student returns to a problem. The function has the responsibility to then use this state appropriately.

  The state that is passed is:

  - The previous output of **gradefn** (i.e., the previous answer) if **get_statefn** is not defined.

  - The previous output of **get_statefn** (see below) otherwise.

  It is the responsibility of the iframe to do proper verification of the argument that it receives via **set_statefn**.

- **get_statefn**

  Sometimes the state and the answer are quite different. For instance, a problem that involves using a javascript program that allows the student to alter a molecule may grade based on the molecule's hydrophobicity, but from the hydrophobicity it might be incapable of restoring the state. In that case, a *separate* state may be stored and loaded by **set_statefn**. Note that if **get_statefn** is defined, the answer (i.e., what is passed to the enclosing response type) will be a json string with the following format:

  ```
  {
      answer: `[answer string]`
      state: `[state string]`
  }
  ```

  The enclosing response type must then parse this as json.

- **height** and **width**

  The **height** and **width** attributes are straightforward: they specify the height and width of the IFrame. Both are limited by the enclosing DOM elements, so for instance there is an implicit max-width of around 900.

  In the future, JSInput may attempt to make these dimensions match the HTML file's dimensions (up to the aforementioned limits), but currently it defaults to *500* and *400* for **height** and **width**, respectively.

7.8 Drag and Drop Problem

In drag and drop problems, students respond to a question by dragging text or objects to a specific location on an image.

The following drag and drop exercise first appeared in MIT's 7.00x: Introduction to Biology - The Secret of Life course in March 2013.

You are shown one of many possible molecules. On the structure of allopurinol below, identify the functional groups that are present by dragging the functional group name listed onto the appropriate target boxes on the structure. If you want to change an answer, you have to drag off the name as well. You may need to scroll through the names of functional groups to see all options.
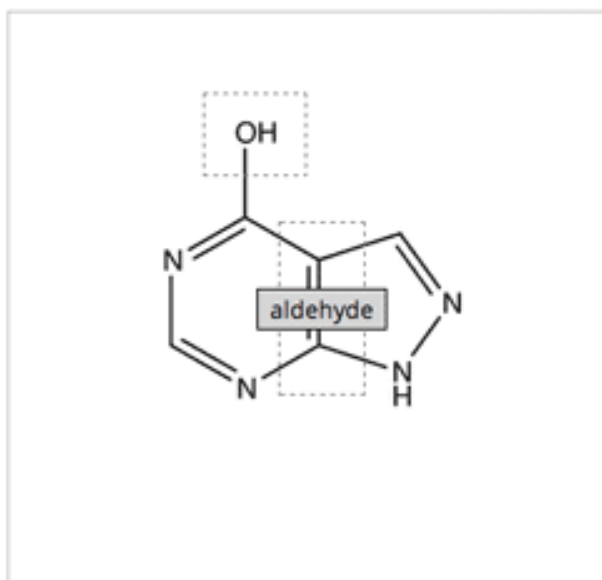
| ◄ | methyl | hydroxyl | amino | carboxyl | aldehyde | phospha | ► |
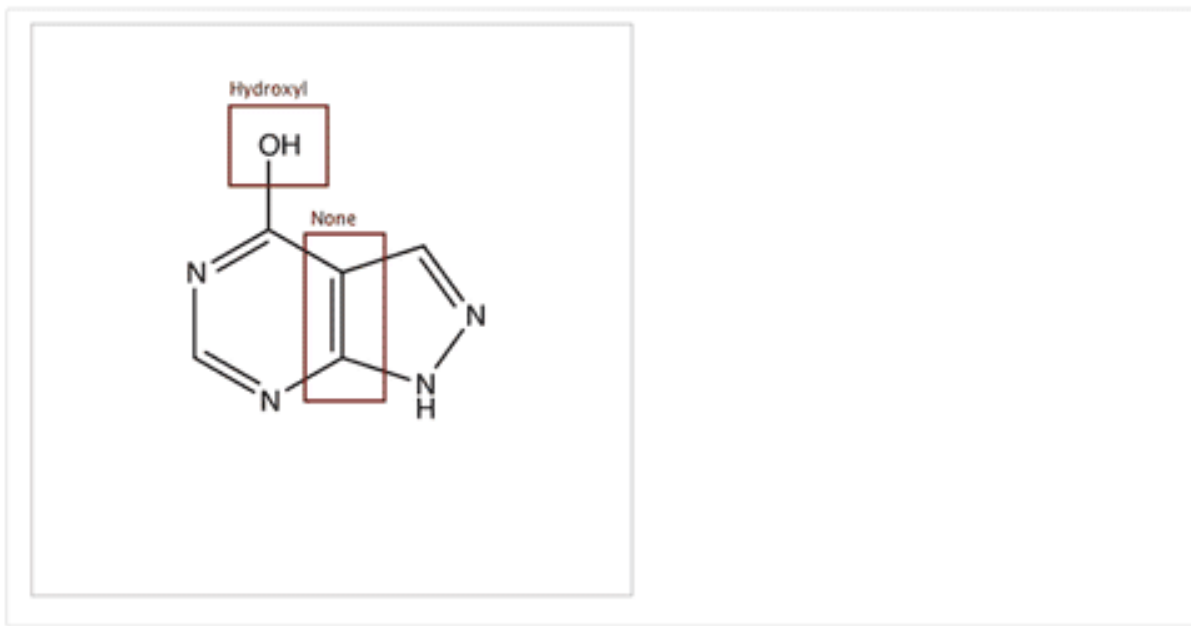
7.8.1 Creating a Drag and Drop Problem

To create a simple drag and drop problem in which students drag labels onto an image, you'll upload the image that you want students to drag labels onto, and then create a Problem component.

1. On the **Files & Uploads** page, upload your image file. For more information about uploading files, see *Adding Files to a Course*.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Drag and Drop**.

4. In the component that appears, click **Edit**.

5. In the component editor, replace the example text with the text of your problem.

6. In the `<drag_and_drop_input>` tag, replace **https://studio.edx.org/c4x/edX/DemoX/asset/L9_buckets.png** with the URL of your image file on the **Files & Uploads** page (for example, **/static/Image.png**).

7. For at least one `<draggable>` tag, replace the text of the **label** attribute with the text of the label you want students to drag. For example, if you want students to drag the word "Iceland" onto your image, the new tag would resemble the following:

   `<draggable id="1" label="Iceland"/>`

8. Repeat the previous step for all the labels that you want to use. Make sure that the **id** attribute is different for each `<draggable>` tag.

9. Determine the coordinates and radius of the correct area on the image.

10. Under `correct_answer = {`, add an entry for each label, using the following format. These values are in pixels:

    `'id':  [[x coordinate, y coordinate], radius]`

    For example, if your image is 600 pixels wide and 400 pixels high, and you want your students to drag the Iceland label to an area in the upper-left part of the image and drag a Sweden label near the lower-right part of your image, the code would resemble the following (where 2 is the ID for the Sweden label):

```
correct-answer = {
        '1':    [[50, 50], 75]
        '2':    [[550, 350], 75]}
```

Note: Make sure the code contains the closing curly brace (**}**).

11. Click **Save**.

Sample Drag and Drop Problem Code

To create the drag and drop problem that appears in the image above, you'll download two files from edX, upload these files to to the **Files & Uploads** page, and then add the code for the problem to a Problem component.

1. Download the following files from edX:

   - Allopurinol.gif

   - AllopurinolAnswer.gif

   To download both these files in a .zip archive, click http://files.edx.org/DragAndDropProblemFiles.zip.

2. Upload the Allopurinol.gif and AllopurinolAnswer.gif files to the **Files & Uploads** page.

3. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

4. Click **Drag and Drop**.

5. In the component that appears, click **Edit**.

6. In the component editor, replace the example code with the following code.

7. Click **Save**.

Problem Code:

```
<problem>
  <p> Allopurinol is a drug used to treat and prevent gout, a very painful form of arthritis. Once or
  <p> You are shown one of many possible molecules. On the structure of allopurinol below, identify t
  <customresponse>
    <drag_and_drop_input no_labels="true" one_per_target="true" target_outline="true" img="/static/Al
      <draggable can_reuse="true" label="methyl" id="1"/>
      <draggable can_reuse="true" label="hydroxyl" id="2"/>
      <draggable can_reuse="true" label="amino" id="3"/>
      <draggable can_reuse="true" label="carboxyl" id="4"/>
      <draggable can_reuse="true" label="aldehyde" id="5"/>
      <draggable can_reuse="true" label="phosphate" id="6"/>
      <draggable can_reuse="true" label="sulfhydryl" id="7"/>
      <draggable can_reuse="true" label="phenyl" id="8"/>
      <draggable can_reuse="true" label="none" id="none"/>
      <target id="0" h="53" w="66" y="55.100006103515625" x="131.5"/>
      <target id="1" h="113" w="55" y="140.10000610351562" x="181.5"/>
    </drag_and_drop_input>
    <answer type="loncapa/python">
correct_answer = [ {'draggables': ['2'], 'targets': ['0' ], 'rule':'unordered_equal' },
{'draggables': ['none'], 'targets': ['1' ], 'rule':'unordered_equal' }]
if draganddrop.grade(submission[0], correct_answer):
    correct = ['correct']
else:
    correct = ['incorrect']
    </answer>
  </customresponse>
  <solution>
    <img src="/static/AllopurinolAnswer.gif"/>
  </solution>
</problem>
```

7.8.2 Drag and Drop Problem XML

```
<problem>
    Here's an example of a "Drag and Drop" question set. Click and drag each word in the scrollbar be
    <customresponse>
        <drag_and_drop_input img="https://studio.edx.org/c4x/edX/DemoX/asset/L9_buckets.png">
            <draggable id="1" label="a"/>
            <draggable id="2" label="cat"/>
            <draggable id="3" label="there"/>
            <draggable id="4" label="pear"/>
            <draggable id="5" label="kitty"/>
            <draggable id="6" label="in"/>
            <draggable id="7" label="them"/>
```

```
            <draggable id="8" label="za"/>
            <draggable id="9" label="dog"/>
            <draggable id="10" label="slate"/>
            <draggable id="11" label="few"/>
        </drag_and_drop_input>
        <answer type="loncapa/python">
            correct_answer = {
                '1':        [[70, 150], 121],
                '6':        [[190, 150], 121],
                '8':        [[190, 150], 121],
                '2':        [[310, 150], 121],
                '9':        [[310, 150], 121],
                '11':       [[310, 150], 121],
                '4':        [[420, 150], 121],
                '7':        [[420, 150], 121],
                '3':        [[550, 150], 121],
                '5':        [[550, 150], 121],
                '10':       [[550, 150], 121]}
            if draganddrop.grade(submission[0], correct_answer):
                correct = ['correct']
            else:
                correct = ['incorrect']
        </answer>
    </customresponse>
    <customresponse>
        <text>
            <h2>Drag and Drop with Outline</h2>
            <p>Please label hydrogen  atoms connected with left carbon atom.</p>
        </text>
        <drag_and_drop_input img="https://studio.edx.org/c4x/edX/DemoX/asset/ethglycol.jpg" target_ou
            <draggable id="1" label="Hydrogen" />
            <draggable id="2" label="Hydrogen" />
            <target id="t1_o" x="10" y="67" w="100" h="100"/>
            <target id="t2" x="133" y="3" w="70" h="70"/>
            <target id="t3" x="2" y="384" w="70" h="70"/>
            <target id="t4" x="95" y="386" w="70" h="70"/>
            <target id="t5_c" x="94" y="293" w="91" h="91"/>
            <target id="t6_c" x="328" y="294" w="91" h="91"/>
            <target id="t7" x="393" y="463" w="70" h="70"/>
            <target id="t8" x="344" y="214" w="70" h="70"/>
            <target id="t9_o" x="445" y="162" w="100" h="100"/>
            <target id="t10" x="591" y="132" w="70" h="70"/>
        </drag_and_drop_input>
        <answer type="loncapa/python">
            correct_answer = [{
                'draggables': ['1', '2'],
                'targets': ['t2', 't3', 't4' ],
                'rule':'anyof'
            }]
            if draganddrop.grade(submission[0], correct_answer):
                correct = ['correct']
            else:
                correct = ['incorrect']
        </answer>
    </customresponse>
</problem>
```

Tags

- `<customresponse>`: Indicates that the problem is a custom response problem.
- `<drag_and_drop_input>`: Indicates the custom response problem is a drag and drop problem.
- `<draggable>`: Specifies a single object that a student will drag onto the base image.
- `<target>`: Specifies the location on the base image where a draggable must be dropped.

Tag: `<drag_and_drop_input>`

Attributes

Attribute	Description
img (required)	Relative path to an image that will be the base image. All draggables can be dragged onto it.
target_outline	Specifies whether an outline (gray dashed line) should be drawn around targets (if they are specified). It can be either 'true' or 'false'. If not specified, the targets do not have outlines.
one_per_target	Specify whether to allow more than one draggable to be placed onto a single target. It can be either 'true' or 'false'. If not specified, the default value is 'true'.
no_labels (required)	The default is false. In default behavior, if label is not set, label is obtained from id. If no_labels is true, labels are not automatically populated from id, and one cannot set labels and obtain only icons.

Children

- `<draggable>`
- `<target>`

Tag: `<draggable>`

Specifies a single draggable object in a drag and drop problem.

A draggable is what the user must drag out of the slider and drop onto the base image. After a drag operation, if the center of the draggable is located outside the rectangular dimensions of the image, it will be returned to the slider.

For the grader to work, each draggable must have a unique ID.

Attributes

Attribute	Description
id (required)	Unique identifier of the draggable object.
label (optional)	Text label that the user sees.
icon (optional)	For draggables that are images, the relative path to the image file.
can_reuse	The default is false. If true, the same draggable can be used multiple times.

Children

(none)

Tag: `<target>`

Specifies the location on the base image where a student must drop a draggable item. By design, if the center of a draggable lies within the target (i.e. in the rectangle defined by [[x, y], [x + w, y + h]], it is within the target. Otherwise, it is outside.

If you specify at least one target, and a student drops a draggable item on a location that is outside a target, the draggable item returns to the slider.

If you don't specify a target, a student can drop a draggable item anywhere on the base image.

Attributes

Attribute	Description
id (required)	Unique identifier of the target object.
x	X-coordinate on the base image where the top left corner of the target will be positioned.
y	Y-coordinate on the base image where the top left corner of the target will be positioned.
w	Width of the target, in pixels.
h	Height of the target, in pixels.

Children

(none)

7.8.3 Targets on Draggables

Sometimes it is not enough to have targets only on the base image, and all of the draggables on these targets. If a complex problem exists where a draggable must become itself a target (or many targets), then the following extended syntax can be used.

```
...
<draggable {attribute list}>
    <target {attribute list} />
    <target {attribute list} />
    <target {attribute list} />
    ...
</draggable>
...
```

The attribute list in the tags above (`draggable` and `target`) is the same as for normal `draggable` and `target` tags. The only difference is when you will be specifying inner target position coordinates. Use the `x` and `y` attributes to set the offset of the inner target from the upper-left corner of the parent draggable (that contains the inner target).

Limitations of targets on draggables

- Currently there is a limitation to the level of nesting of targets.

  Even though you can pile up a large number of draggables on targets that themselves are on draggables, the Drag and Drop problem will be graded only if there is a maximum of two levels of targets. The first level are the *base* targets. They are attached to the base image. The second level are the targets defined on draggables.

- Another limitation is that the target bounds are not checked against other targets.

  You must make sure that there is no overlapping of targets. You should also ensure that targets on draggables are smaller than the actual parent draggable. Technically this is not necessary, but from the usability perspective it is desirable.

- You can have targets on draggables only in the case when there are base targets defined (base targets are attached to the base image).

  If you do not have base targets, then you can only have a single level of nesting (draggables on the base image). In this case the client side will be reporting (x,y) positions of each draggable on the base image.

7.8.4 Correct answer format

For specifying answers for targets on draggables, see *Answer format for targets on draggables*.

There are two correct answer formats: short and long.

In short form, the correct answer is mapping of `draggable_id` to `target_id`:

```
correct_answer = {'grass':      [[300, 200], 200], 'ant': [[500, 0], 200]}
correct_answer = {'name4': 't1', '7': 't2'}
```

In long form, the correct answer is list of dicts. Every dict has 3 keys: `draggables`, `targets` and `rule`. For example:

```
correct_answer = [
{
  'draggables':    ['7', '8'],
  'targets':  ['t5_c', 't6_c'],
  'rule': 'anyof'
},
{
  'draggables': ['1', '2'],
  'targets': ['t2_h', 't3_h', 't4_h', 't7_h', 't8_h', 't10_h'],
  'rule': 'anyof'
}]
```

"Draggables" is the list of draggable IDs. "Target" is the list of target IDs that draggables must be dragged to.

> **Caution:** Draggables in dicts inside the `correct_answer` list must not intersect.

Wrong (for draggable id 7):

```
correct_answer = [
{
  'draggables':    ['7', '8'],
  'targets':  ['t5_c', 't6_c'],
  'rule': 'anyof'
},
{
  'draggables': ['7', '2'],
  'targets': ['t2_h', 't3_h', 't4_h', 't7_h', 't8_h', 't10_h'],
  'rule': 'anyof'
}]
```

The values for `rule` follow.

- `exact`: Targets for draggable IDs in `user_answer` are the same as targets from the correct answer. For example, for draggables 7 and 8, the user must drag 7 to target1 and 8 to target2 if the `correct_answer` is:

```
correct_answer = [
  {
  'draggables':    ['7', '8'],
  'targets':  ['tartget1', 'target2'],
  'rule': 'exact'
}]
```

- `unordered_equal`: Allows draggables be dragged to targets unordered. For students to drag 7 to target1 or target2 and 8 to target2 or target1 and 7 and 8 must be in different targets, then correct answer must be:

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['tartget1', 'target2'],
  'rule': 'unordered_equal'
}]
```

- `anyof`: Allows draggables to be dragged to any target. For students to drag 7 and 8 to target1 or target2, any of these are correct with the *anyof* rule:

```
correct_answer = [
{
  'draggables':   ['7', '8'],
  'targets':  ['tartget1', 'target2'],
  'rule': 'anyof'
}]
```

If `can_reuse` is true, then you have draggables a,b,c and 10 targets. These will allow you to drag 4 a draggables to [`target1, target4, target7, target10`]; you do not need to write a four times. Also this will allow you to drag the b draggable to target2 or target5 for target5 and target2.:

```
correct_answer = [
    {
      'draggables': ['a'],
      'targets': ['target1',  'target4', 'target7', 'target10'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['b'],
      'targets': ['target2', 'target5', 'target8'],
      'rule': 'anyof'
    },
    {
      'draggables': ['c'],
      'targets': ['target3', 'target6', 'target9'],
      'rule': 'unordered_equal'
    }]
```

Sometimes you want to allow students to drag only two b draggables. In this case you should use the `anyof+number` or `unordered_equal+number` rule:

```
correct_answer = [
    {
      'draggables': ['a', 'a', 'a'],
      'targets': ['target1',  'target4', 'target7'],
      'rule': 'unordered_equal+number'
    },
    {
      'draggables': ['b', 'b'],
      'targets': ['target2', 'target5', 'target8'],
      'rule': 'anyof+number'
    },
    {
      'draggables': ['c'],
      'targets': ['target3', 'target6', 'target9'],
      'rule': 'unordered_equal'
    }]
```

When there are no multiple draggables per targets (one_per_target=``true``), for the same number of draggables,

---

anyof is equal to `unordered_equal`.

If `can_reuse=true`, then you must use only the long form of the correct answer.

Answer format for targets on draggables

As with the cases described above, an answer must provide precise positioning for each draggable (on which targets it must reside). In the case when a draggable must be placed on a target that itself is on a draggable, then the answer must contain the chain of target-draggable-target.

For example, suppose we have three draggables - `up`, `s`, and `p`. Draggables `s` and `p` have targets on themselves. More specifically, `p` has three targets - 1, 2, and 3. The first requirement is that `s` and `p` are positioned on specific targets on the base image. The second requirement is that draggable `up` is positioned on specific targets of draggable `p`. Below is an excerpt from a problem:

```
<draggable id="up" icon="/static/images/images_list/lcao-mo/up.png" can_reuse="true" />

<draggable id="s" icon="/static/images/images_list/lcao-mo/orbital_single.png" label="s orbital" can_
    <target id="1" x="0" y="0" w="32" h="32"/>
</draggable>

<draggable id="p" icon="/static/images/images_list/lcao-mo/orbital_triple.png" can_reuse="true" label
  <target id="1" x="0" y="0" w="32" h="32"/>
  <target id="2" x="34" y="0" w="32" h="32"/>
  <target id="3" x="68" y="0" w="32" h="32"/>
</draggable>

...

correct_answer = [
    {
      'draggables': ['p'],
      'targets': ['p-left-target', 'p-right-target'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['s'],
      'targets': ['s-left-target', 's-right-target'],
      'rule': 'unordered_equal'
    },
    {
      'draggables': ['up'],
      'targets': ['p-left-target[p][1]', 'p-left-target[p][2]', 'p-right-
         target[p][2]', 'p-right-target[p][3]',],
      'rule': 'unordered_equal'
    }
]
```

Note that you must specify rules for all draggables, even if a draggable gets included in more than one chain.

7.8.5 Grading logic

1. The student's answer and the correct answer are parsed to the same format.

```
   group_id: group_draggables, group_targets, group_rule
```

group_id is ordinal number, for every dict in correct answer incremental group_id is assigned: 0, 1, 2, ...

Draggables from the user answer are added to the same group_id where identical draggables from the correct answer are, for example:

```
If correct_draggables[group_0] = [t1, t2] then
user_draggables[group_0] are all draggables t1 and t2 from the user answer:
[t1] or [t1, t2] or [t1, t2, t2] etc..
```

2. For every group from the user answer, for that group's draggables, if number is in the group rule, set() is applied. If number is not in rule, set is not applied:

```
set() : [t1, t2, t3, t3] -> [t1, t2, ,t3]
```

For every group, at this step, draggables lists are equal.

3. For every group, lists of targets are compared using the rule for that group.

Set and `+number` cases

set() and +number are needed only for the case of reusable draggables. For other cases there are no equal draggables in list, so set() does nothing.

- The set() operation allows you to create a rule for the case of "any number of the same draggable can be dragged to targets":

```
{
    'draggables': ['draggable_1'],
    'targets': ['target3', 'target6', 'target9'],
    'rule': 'anyof'
}
```

- The number rule is used for the case of reusable draggables, when you want to fix number of draggable to drag. In this example only two instances of draggables_1 are allowed to be dragged:

```
{
    'draggables': ['draggable_1', 'draggable_1'],
    'targets': ['target3', 'target6', 'target9'],
    'rule': 'anyof+number'
}
```

- Note, that in using rule exact, one does not need number, because you cannot recognize from the user interface which reusable draggable is on which target. For example:

```
{
    'draggables': ['draggable_1', 'draggable_1', 'draggable_2'],
    'targets': ['target3', 'target6', 'target9'],
    'rule': 'exact'
}


Correct handling of this example is to create different rules for
draggable_1 and draggable_2.
```

- For unordered_equal (or exact) you don't need number if you have only the same draggable in the group, as the target length will provide the constraint for the number of draggables:

```
{
    'draggables': ['draggable_1'],
    'targets': ['target3', 'target6', 'target9'],
    'rule': 'unordered_equal'
}
```

This means that only `draggable_1` can be dragged.

- But if you have more than one different reusable draggable in the list, you may use the `number` rule:

```
{
    'draggables': ['draggable_1', 'draggable_1', 'draggable_2'],
    'targets': ['target3', 'target6', 'target9'],
    'rule': 'unordered_equal+number'
}
```

If you do not use `number`, the draggables list will be set to [`draggable_1`, `draggable_2`].

7.9 Dropdown Problem

Topic Contents

- *Overview*
- *Analyzing Performance on Dropdown Problems*
- *Create a Dropdown Problem*
- *Use Feedback in a Dropdown Problem*
- *Use Hints in a Dropdown Problem*
- *Dropdown Problem XML*

7.9.1 Overview

Dropdown problems allow learners to choose from a collection of answer options that are presented in a dropdown list. Unlike *multiple choice* problems, which have answers that are always visible directly below the question, dropdown problems do not show answer choices until the learner clicks the dropdown arrow.

7.9.2 Analyzing Performance on Dropdown Problems

For the dropdown problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

7.9.3 Create a Dropdown Problem

You can create dropdown problems in the Simple Editor or in the Advanced Editor. You can set up a problem in the Simple Editor, and then switch to the Advanced Editor to add more configuration options in XML. However, you cannot switch back to the Simple Editor from the Advanced Editor. Therefore, you might want to format the problem as completely as possible before you begin to use the Advanced Editor.

Use the Simple Editor to Create a Dropdown Problem

To use the *Simple Editor* to create a dropdown problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select one of the two dropdown problem templates.

   - From the list of **Common Problem Types**, select **Dropdown**.

   - From the list of **Common Problems with Hints and Feedback**, select **Dropdown with Hints and Feedback**. For more information, see *Use Feedback in a Dropdown Problem*.

     Studio adds the problem to the unit.

3. Select **Edit**. The Simple Editor opens.

4. Replace the sample problem text with your own text.

5. Determine the text that describes the question you want learners to answer, and surround that text with two pairs of angle brackets (`>>question<<`). This question text is the accessible label for the problem.

6. Edit your text to place all of the possible answers on the same line, separated by commas.

7. Select all of the answer options, and then select **Dropdown** from the toolbar. A double set of brackets (`[[ ]]`) appears to surround the answer options.

8. To identify the problem's answer, locate that answer inside the brackets and surround the correct answer with parentheses.

9. To provide an explanation, select the explanation text and then select **Explanation** from the toolbar. `[explanation]` appears before and after the explanation text.

10. Select **Settings** and provide an identifying **Display Name** for the problem.

11. Define additional settings for the problem. For more information, see *Problem Settings*.

12. Select **Save**.

For the example problem illustrated above, the following text is displayed in the problem component.

```
>>What type of data are the following?<<

Age:
[[Nominal, Discrete, (Continuous)]]
Age, rounded to the nearest year:
[[Nominal, (Discrete), Continuous]]
Life stage – infant, child, and adult:
[[(Nominal), Discrete, Continuous]]
```

Use the Advanced Editor to Edit a Dropdown Problem

To use the Advanced Editor to edit a dropdown problem, follow these steps.

1. Follow the steps for creating the problem in the *Simple Editor*.

2. Select **Advanced Editor**, and then edit the XML to add the tags and attributes you want. An example follows.

Problem Code:

```xml
<problem>
<p>
  <em>This exercise first appeared in HarvardX's PH207x Health in Numbers:
  Quantitative Methods in Clinical &amp; Public Health Research course, fall
  2012.</em>
</p>
<p>What type of data are the following?</p>
<p>Age:</p>
<optionresponse>
  <optioninput options="('Nominal','Discrete','Continuous')"
    correct="Continuous" label="Age"/>
</optionresponse>
<p>Age, rounded to the nearest year:</p>
<optionresponse>
  <optioninput options="('Nominal','Discrete','Continuous')"
    correct="Discrete" label="Age, rounded to the nearest year"/>
</optionresponse>
```

```
<p>Life stage - infant, child, and adult:</p>
<optionresponse>
  <optioninput options="('Nominal','Discrete','Continuous')"
    correct="Nominal" label="Life stage"/>
</optionresponse>
</problem>
```

7.9.4 Use Feedback in a Dropdown Problem

You can add feedback in a dropdown problem using the simple editor or the advanced editor. For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*.

In dropdown problems, you can provide feedback for each option that a learner can select. Use the following guidelines when providing feedback.

- Use feedback for the incorrect answers to target common misperceptions and mistakes.

- Ensure feedback provides some guidance to the learner about how to arrive at the correct answer.

- Use feedback for the correct answer as an opportunity to reinforce why the answer is correct. Because learners are able to guess, ensure that feedback provides a reason why the answer is correct for learners who might have selected that answer by chance.

Configure Feedback in the Simple Editor

In the *Simple Editor*, you configure answer feedback with the following syntax. When you create a new dropdown problem, select the template **Dropdown with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
Wrong Answer {{Feedback for learners who select this answer.}}
(Correct Answer) {{Feedback for learners who select this answer.}}
```

For example, the following problem has feedback for each possible answer.

```
>>A/an _____ is an example of a vegetable.<<

[[
  apple {{An apple is the fertilized ovary that comes from an apple tree and
    contains seeds classifying it as a fruit.}}
  pumpkin {{A pumpkin is the fertilized ovary of a squash plant and contains
    seeds classifying it as a fruit.}}
  (potato) {{A potato is an edible part of a plant in tuber form and is
    classified as a vegetable}}
  tomato {{Many people mistakenly think a tomato is a vegetable. However,
    because a tomato is the fertilized ovary of a tomato plant and contains
    seeds it is classified as a fruit.}}
]]
```

Configure Feedback in the Advanced Editor

In the *Advanced Editor*, you configure answer feedback with the following syntax.

```
<option correct="False">
  Option Label
  <optionhint>
    Feedback for when learner selects this answer.
```

```
      </optionhint>
</option>
```

For example, the following problem has feedback for each answer.

```
<optionresponse>
  <optioninput label="A/an _____ is an example of a vegetable.">
    <option correct="False">
      apple
      <optionhint>
        An apple is the fertilized ovary that comes from an apple tree and
        contains seeds classifying it as a fruit.
      </optionhint>
    </option>
    <option correct="False">
      pumpkin
      <optionhint>
        A pumpkin is the fertilized ovary of a squash plant and contains
        seeds classifying it as a fruit.
      </optionhint>
    </option>
    <option correct="True">
      potato
      <optionhint>
        A potato is an edible part of a plant in tuber form and is
        classified as a vegetable.
      </optionhint>
    </option>
    <option correct="False">
      tomato
      <optionhint>
        Many people mistakenly think a tomato is a vegetable. However,
        because a tomato is the fertilized ovary of a tomato plant and
        contains seeds it is classified as a fruit.
      </optionhint>
    </option>
  </optioninput>
</optionresponse>
```

Customize Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

Note: The default labels **Correct** and **Incorrect** are displayed in the learner's requested language. If you provide custom labels, they are displayed to all users as you configure them and are not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *Simple Editor*, you configure custom feedback labels with the following syntax.

```
( ) Answer {{Label:: Feedback for learners who select this answer.}}
```

For example, the following feedback is configured to use a custom label.

```
( ) tomato {{Not Quite:: Many people mistakenly think a tomato is a
vegetable. However, because a tomato is the fertilized ovary of a tomato
plant and contains seeds, it is a fruit.}}
```

Customize Feedback Labels in the Advanced Editor

In the *Advanced Editor*, you configure custom feedback labels with the following syntax.

```
<option correct="False">
  Answer
  <optionhint label="Custom Label">
    Feedback for learners who select this answer.
  </optionhint>
</option>
```

For example, the following feedback is configured to use a custom label.

```
<option correct="False">
  tomato
  <optionhint label="Not Quite">
    Many people mistakenly think a tomato is a vegetable. However, because a
    tomato is the fertilized ovary of a tomato plant and contains seeds it
    is classified as a fruit.
  </optionhint>
</option>
```

7.9. Dropdown Problem

7.9.5 Use Hints in a Dropdown Problem

You can use hints in a dropdown problem, using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you configure each hint in the `<hint>` element within the `<demandhint>` element.

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
```

For example, the following XML shows two hints.

```
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
```

7.9.6 Dropdown Problem XML

Template

```
<problem>
<legend>Question text</legend>
<optionresponse>
  <option correct="False">
    Option Label
    <optionhint>
      Feedback for when learner selects this answer.
    </optionhint>
  </option>
  <option correct="True">
    Option Label
```

```
    <optionhint>
      Feedback for when learner selects this answer.
    </optionhint>
  </option>
</optionresponse>
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
<solution>
  <div class="detailed-solution">
    <p>Explanation or Solution Header</p>
    <p>Explanation or solution text</p>
  </div>
</solution>
</problem>
```

Tags

- `<optionresponse>` (required): Indicates that the problem is a dropdown problem.
- `<option>` (required): Lists an answer option.
- `<demandhint>` (optional): Specifies hints for the learner.

Tag: `<optionresponse>`

Indicates that the problem is a dropdown problem.

> Attributes
>
> (none)
>
> Children
>
> `<option>`

Tag: `<option>`

Lists the answer options.

> Attributes

Attribute	Description
correct (required)	Indicates whether an answer is correct. Possible values are "true" and "false". Only one **correct** attribute can be set to "true".

> Children
>
> `<optionhint>`

Tag: `<optionhint>`

Specifies a hint for the answer.

Tag: `<demandhint>`

Specifies hints available to the learner.

> Children
>
> `<hint>`

Tag: `<hint>`

Specifies a hint available to the learner.

> Children

> (none)

7.10 External Grader

7.10.1 Overview

An external grader is a service that receives learner responses to a problem, processes those responses, and returns feedback and a problem grade to the edX platform. You build and deploy an external grader separately from the edX platform.

See the following sections for more information:

- *External Grader Example*
- *External Graders and XQueue*
- *The XQueue Interface*
- *Building an External Grader*
- *Create a Code Response Problem*

7.10.2 External Grader Example

An external grader is particularly useful for software programming courses where learners are asked to submit complex code. The grader can run tests that you define on that code and return results to a learner.

For example, you define a problem that requires learners to submit Python code, and create a set of tests that an external grader can run to verify the submissions. When a learner enters Python code for the problem and selects **Check**, the code is sent to the grader for testing. If the code passes all tests, the grader returns the score and a string indicating that the solution is correct.

```
12      for month in range(12):
13          month += 1
14          tempBalance -= lowestPayment
15          tempBalance += (annualInterestRate/12) * tempBalance
16      if tempBalance < 0.1 and tempBalance > -0.1:
17          break;
18      if tempBalance > 0:
```

✔ Correct

Test results

See full output

CORRECT

See full output

The external grader can return a string with results, which the learner can see by selecting **See full output**. This can be particularly useful when the solution is not correct and you want to return information about the failed tests. For example:

7.10.3 External Graders and XQueue

The edX platform communicates with your external grader through XQueue. XQueue provides learners' input to the grader; it then receives results from the grader and returns them to learners.

Submissions are collected in XQueue, where they remain until the grader actively retrieves, or pulls, the next submission from the queue for grading.

The external grader polls the XQueue through a RESTful interface at a regular interval. When the external grader retrieves a submission, it runs the tests on it, then pushes the response back to XQueue through the RESTful interface. XQueue then delivers the response to the edX Learning Management System.

For example code of an external grader that uses Pull mode, see the Stanford- Online repository xqueue_pull_ref.

External Grader Workflow

The following steps describe the complete process of an external grader evaluating a problem.

1. The learner either enters code or attaches a file for a problem, then selects **Check**.

2. The external grader pulls the code from XQueue.

3. The external grader runs the tests that you created on the code.

4. The external grader returns the grade for the submission, as well as any results in a string, to XQueue.

5. The XQueue delivers the results to the edX Learning Management System.

6. The learner sees the problem results and the grade.

The XQueue Name

Your course will use a specific XQueue name. You use this name when you create problems in Studio.

EdX partners who are using external graders should use the base URL `https://xqueue.edx.org` as the XQueue name.

If you are an edX partner, contact your edX program manager for more information. Because edX hosts many XQueues for different courses, you must use the exact XQueue name in your problems, as described in *Create a Code Response Problem*.

7.10.4 The XQueue Interface

The learner submission sent from XQueue to the grader, and the response sent from the grader to XQueue, are JSON objects, as described below.

Note: XQueue does not send the the learner ID to the external grader. Your grader cannot access IDs or associate learner IDs with submissions.

For the code for the XQueue interface, see the file urls.py in the edX XQueue repository.

Inputs to the External Grader

The grader receives a submission as a JSON object that has two keys:

- **student_response**: A string that contains the learner's code submission. The string comes from either input the learner enters in the edX Learning Management System or a file the learner attaches.

- **grader_payload**: An optional string that you can specify when you create the problem. For more information, see the section *Create a Code Response Problem*.

For example:

```
{
  "xqueue_body":
  "{
    "student_response": "def double(x):\n return 2*x\n",
    "grader_payload": "problem_2"
  }"
}
```

External Grader Responses

After running tests and recording results for a submission, the grader must return information by posting a JSON response. The JSON string contains a value that indicates whether the submission was correct, the score, and any message the tests create.

In the following example, the learner's submission was correct, the score was 1, and the tests created a brief message:

```
{
 "correct": true,
 "score": 1,
 "msg": "<p>The code passed all tests.</p>"
}
```

7.10.5 Building an External Grader

The course team, not edX, is responsible for building and deploying the external grader.

In addition to creating tests that are specific to the problems you use in your course, there are four areas that you must plan for when you build an external grader:

- *Scale*
- *Security*
- *Reliability and Recovery*
- *Testing*

Scale

Your external grader must be able to scale to support the number of learners in your course.

Keep in mind that submissions will likely come in spikes, not in an even flow. For example, you should expect the load to be much greater than average in the hours before an exam is due. Therefore, you should verify that the external grader can process submissions from a majority of learners in a short period of time.

Security

Learners submit code that executes directly on a server that you are responsible for. It is possible that a learner will submit malicious code. Your system must protect against this and ensure that the external grader runs only code that is relevant to the course problems. How you implement these protections depends on the programming language you are using and your deployment architecture. You must ensure that malicious code will not damage your server.

Reliability and Recovery

After your course starts, many learners will submit code at any possible time, and expect to see results quickly. If your external grader is prone to failure or unexpected delays, the learner experience will be poor.

Therefore, you must ensure that your grader has high availability and can recover from errors. Before your course starts, you must have a plan to immediately notify the team responsible for operating your grader, as well as edX operations, when the grader fails. In collaboration with edX, you must develop a procedure to quickly identify the cause of failure, which can be your grader or edX's XQueue.

Contact your edX program manager for more information.

If you know the grader will be unavailable at a certain time for maintenance, you should *add a course update*.

Testing

You should test your grader thoroughly before your course starts. Be sure to test incorrect code as well as correct code to ensure that the grader responds with appropriate scores and messages.

7.10.6 Create a Code Response Problem

You create a code response problem in edX Studio by adding a common blank problem, then editing the XML problem definition in the *The Advanced Editor*.

See *Working with Problem Components* for more information.

Following is a basic example of the XML definition of a problem that uses an external grader:

```
<problem display_name="Problem 6">
    <text>
        <p>Write a program that prints "hello world".</p>
    </text>
    <coderesponse queuename="my_course_queue">
        <textbox rows="10" cols="80" mode="python" tabsize="4"/>
        <codeparam>
            <initial_display>
              # students please write your program here
              print ""
            </initial_display>
            <answer_display>
              print "hello world"
            </answer_display>
            <grader_payload>
            {"output": "hello world", "max_length": 2}
            </grader_payload>
        </codeparam>
    </coderesponse>
</problem>
```

Note the following details about the XML definition.

- **queuename**: The value of the queuename attribute of the `<coderesponse>` element maps to an XQueue. Partners should contact their edX program manager for more information. You must use this exact name in order for the problem to communicate with the correct XQueue.

    Note: For edX partners, the base URL that graders must access is `https://xqueue.edx.org`.

- **Input Type**: In this example, the `<textbox>` element specifies the input type. When you use `<textbox>`, the learner enters code in a browser field when viewing the course unit. The other element you can use to specify the input type is `<filesubmission>`, which enables the learner to attach and submit a code file in the unit.

- **<grader_payload>**: You can use the `<grader_payload>` element to send information to the external grader in the form of a JSON object. For example, you can use `<grader_payload>` to tell the grader which tests to run for this problem.

7.11 Full Screen Image Tool

Some large images are difficult for students to view in the courseware. The full screen image tool allows students to enlarge the image, so they can see all the detail in context.

7.11.1 The Student View of a Full Screen Image

The student sees the full screen image in a unit page. When the student hovers the mouse pointer over the image, the **Fullscreen** button appears:
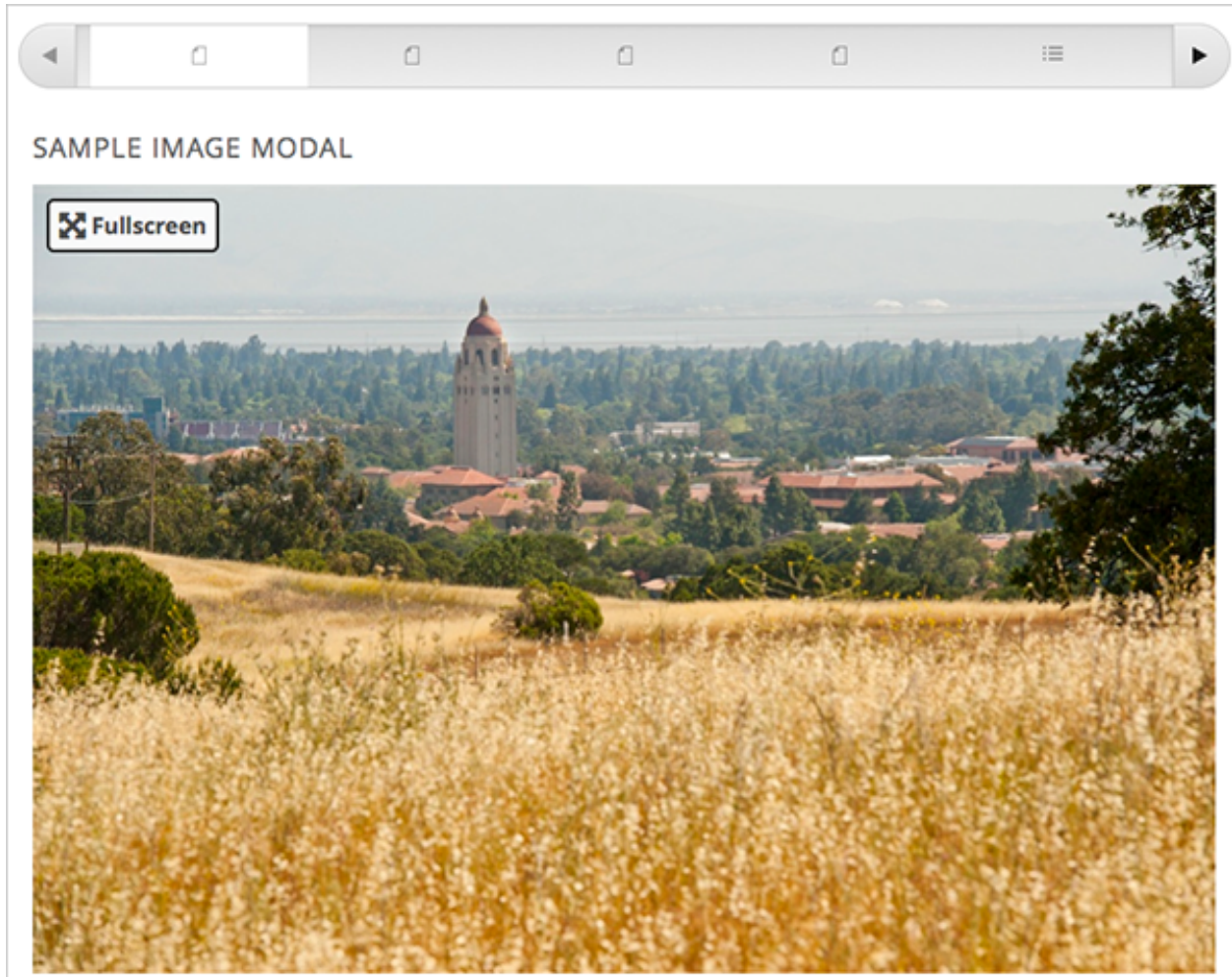
When the student clicks **Fullscreen**, the image opens and expands in the full browser window. The buttons **Close**, **Zoom In**, and **Zoom Out** appear:
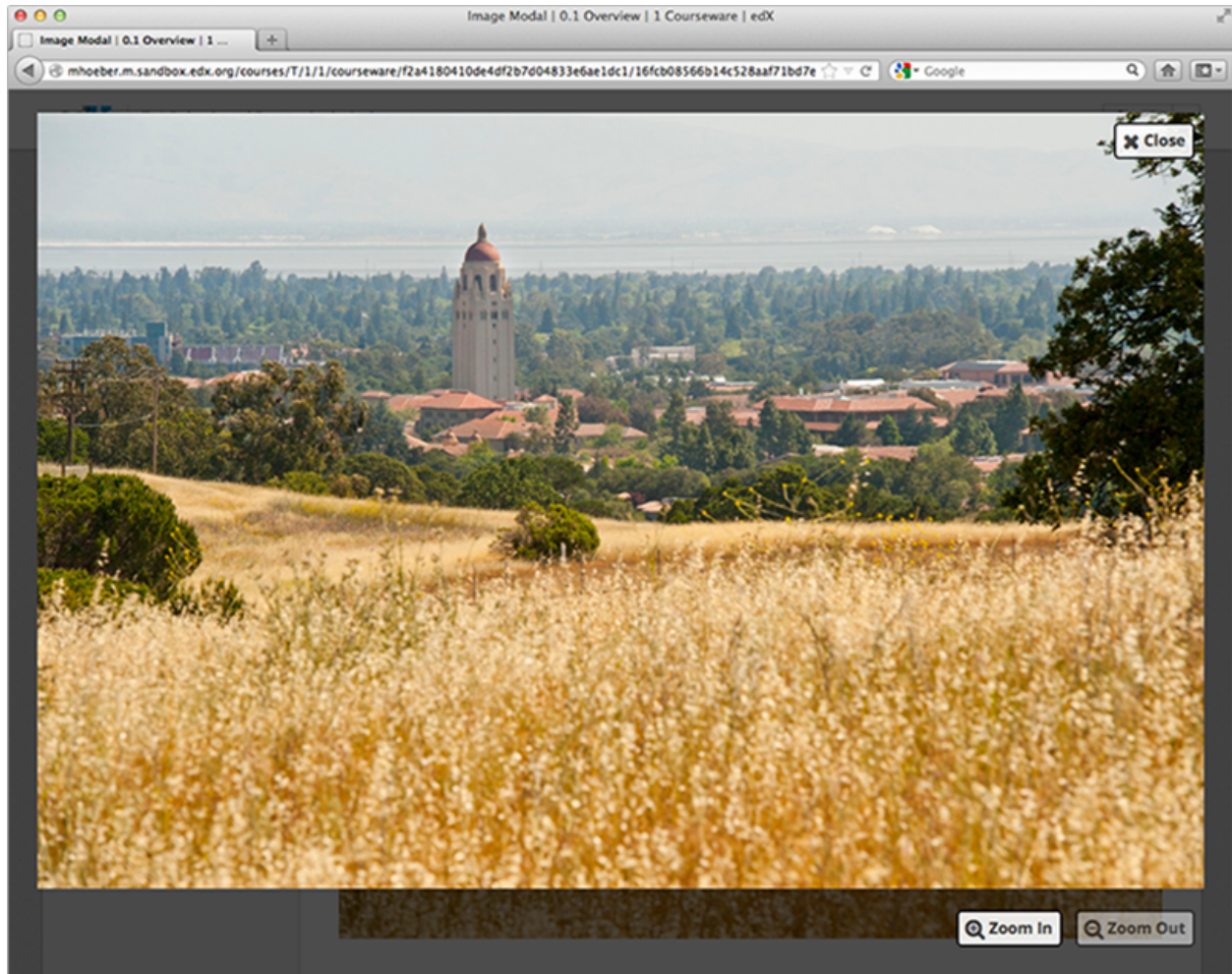
The student can then zoom in on the image, and drag the image to view the desired part of it:
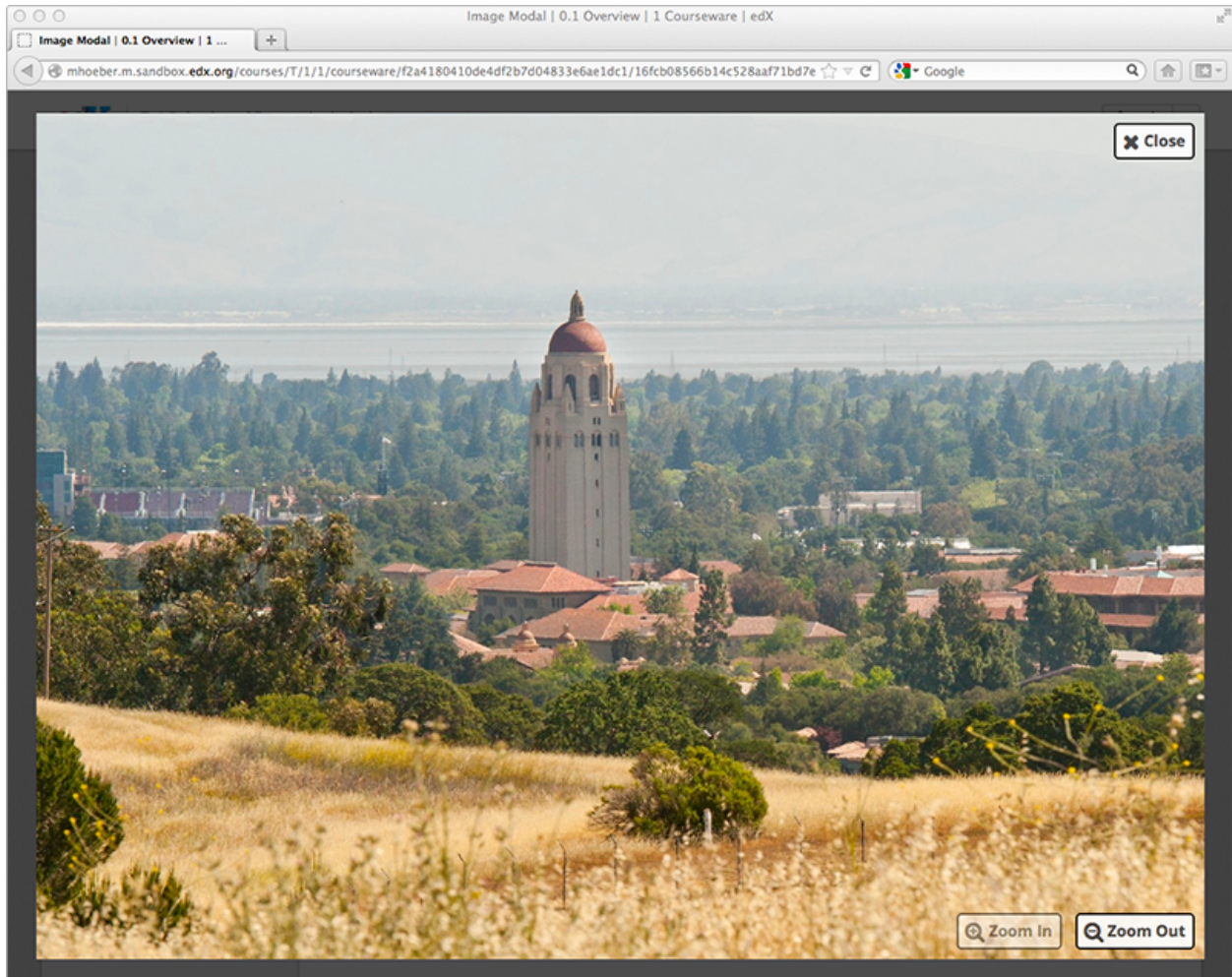
7.11.2 Create a Full Screen Image

1. Upload your image file to the **Files & Uploads** page. For more information about how to do this, see *Adding Files to a Course*.

2. Under **Add New Component**, click **html**, and then click **Full Screen Image**.

3. In the new component that appears, click **Edit**.

4. In the component editor, replace the default title, remove the instructional paragraph, and add text as needed.

5. Switch to the **HTML** tab.

6. Replace the following placeholders with your own content.

   - Replace the value of the <a> element's href attribute with the path to your image. Do not change the value of the class attribute. For example:

     <a href="/static/Image1.jpg" class="modal-content">

   - Replace the value of the <img> element's src attribute with the path to your image. For example:

     ****

   - Ensure that the value of the href and src attributes are the same, and that you do not change the class attribute. Your sample code should look like the following:

```
<h2>Sample Image Modal</h2>
<a href="/static/Image1.jpg" class="modal-content">
<img alt="Full screen image" src="/static/Image1.jpg"/>
</a>
```

Note: You can use this same HTML code in any HTML component, not just those components you created as full screen images.

---

7. Click **Save** to save the HTML component.

7.12 Gene Explorer Tool

The Gene Explorer (GeneX), from the biology department at UMB, simulates the transcription, splicing, processing, and translation of a small hypothetical eukaryotic gene. GeneX allows students to make specific mutations in a gene sequence, and it then calculates and displays the effects of the mutations on the mRNA and protein.

Specifically, the Gene Explorer does the following:

1. Finds the promoter and terminator

2. Reads the DNA sequence to produce the pre-mRNA

3. Finds the splice sites

4. Splices and tails the mRNA

5. Finds the start codon

6. Translates the mRNA
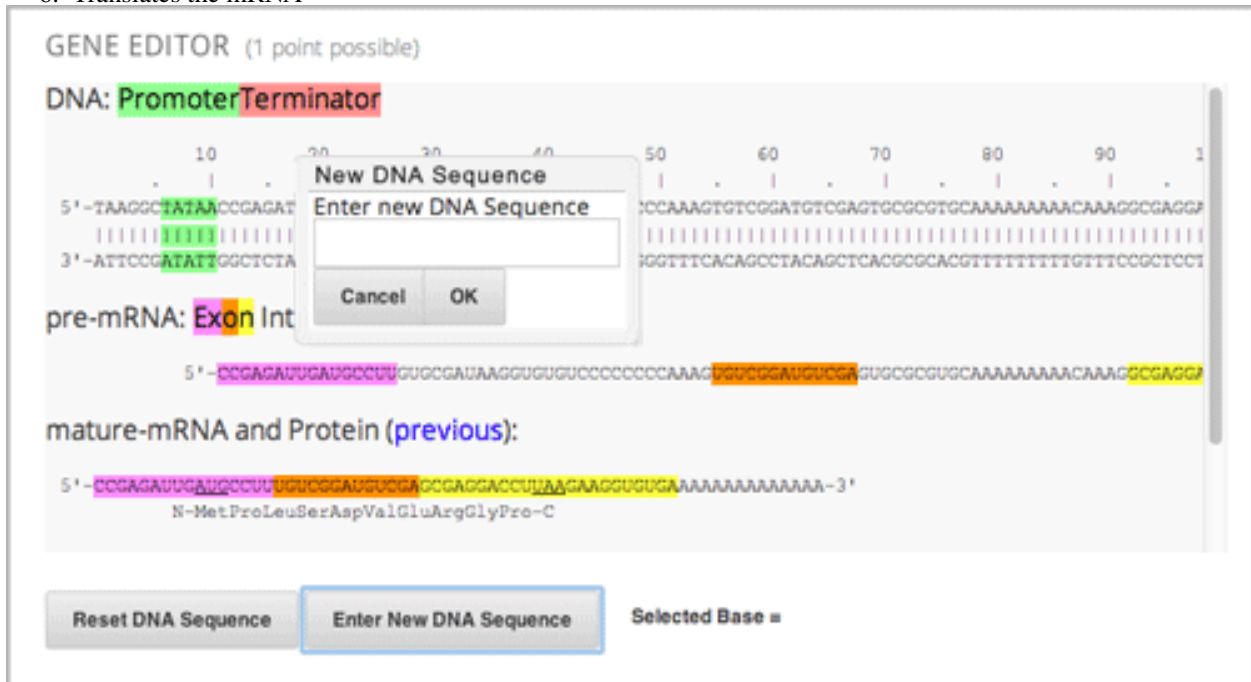
For more information about the Gene Explorer, see The Gene Explorer.

7.12.1 Gene Explorer Code

```
<problem>
<p>Make a single base pair substitution mutation in the gene below that results in a protein that is
<p>Note that a "single base pair substitution mutation" is when a single base is changed to another k
<script type="loncapa/python">
def genex_grader(expect,ans):
    if ans=="CORRECT": return True
    import json
    ans=json.loads(ans)
    return ans["genex_answer"]=="CORRECT"
</script>
<customresponse cfn="genex_grader">
<editageneinput width="818" height="1000" dna_sequence="TAAGGCTATAACCGAGATTGATGCCTTGTGCGATAAGGTGTGTC
</customresponse>
</problem>
```

In this code:

- **width** and **height** specify the dimensions of the application, in pixels.

- **genex_dna_sequence** is the default DNA sequence that appears when the problem opens.

- **dna_sequence** contains the application's state and the student's answer. This value must be the same as **genex_dna_sequence**.

- **genex_problem_number** specifies the number of the problem. This number is based on the five gene editor problems in the MITx 7.00x course–for example, if you want this problem to look like the second gene editor problem in the 7.00x course, you would set the **genex_problem_number** value to 2. The number must be 1, 2, 3, 4, or 5.

7.13 Google Calendar Tool

This chapter describes how to embed Google calendars in your course. For more information, see any of the following topics.

You can also use Google Drive files, such as documents, spreadsheets, and images, in your course. For more information, see *Google Drive Files Tool*.

Note: Google services are not available in some regions and countries. If Google services are not available in a

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learner's area, the learner might see an "image unavailable" message in the place of the Google Drive file or calendar. We strongly suggest that you provide alternative resources for learners in these areas.

7.13.1 Overview

You can embed a Google calendar in your course so that students see the calendar in the courseware. You can use a Google calendar to share quiz dates, office hours, or other schedules of interest to students. For example:
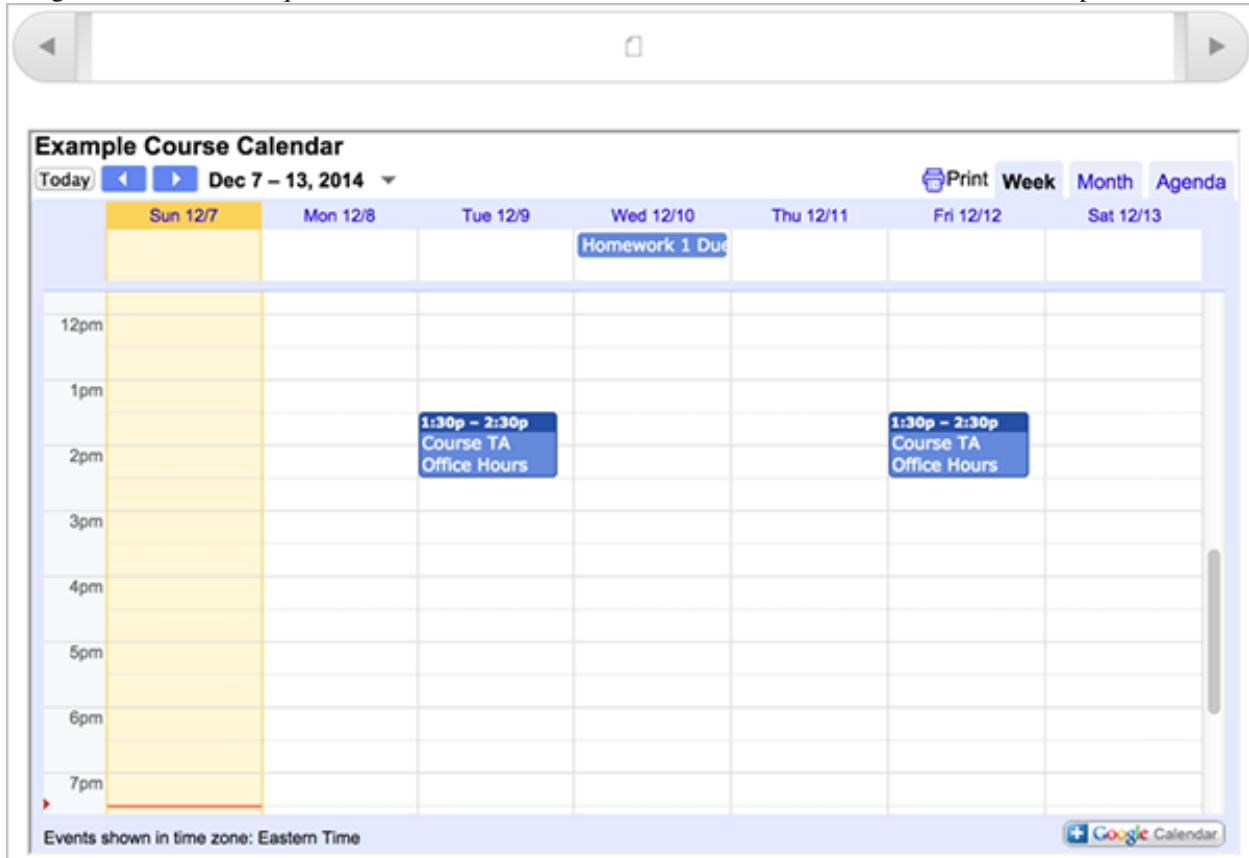
7.13.2 Embedding a Google Calendar in Your Course

Embedding a Google calendar in your course has three steps.

1. *Enable Google calendars in your course* by using *Studio* or *OLX*.

2. *Make the Google calendar public and obtain its ID*.

3. *Add the Google calendar to your course* by using *Studio* or *OLX*.

Enable Google Calendars in the Course

You can enable Google Calendars in the course by using either Studio or OLX.

Enable Google Calendars in edX Studio

To enable Google Calendars in your course:

1. From the **Settings** menu, select **Advanced Settings**.

2. In the **Advanced Module List** field, place your cursor between the braces, and then type `"google-calendar"`. If you see other values in this field, add a comma after the closing quotation mark for the last value, and then type `"google-calendar"`. For example:
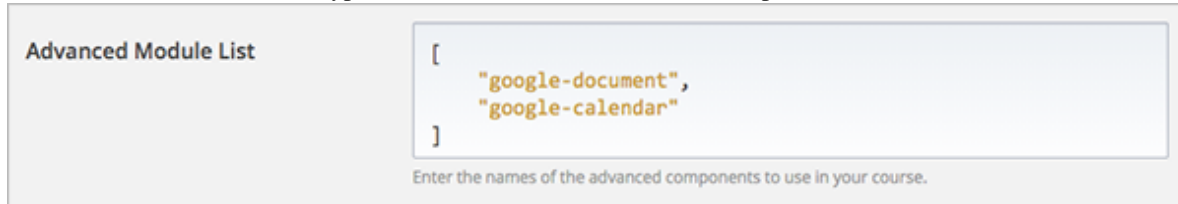
3. At the bottom of the page, select **Save Changes**.

Enable Google Calendars in OLX

To enable Google Calendars in your course, you edit the XML file that defines the course structure. You locate the `course` element's `advanced-modules` attribute, and add the string `google-calendar` to it.

For example, the following XML code enables Google Calendars in a course. It also enables Google Drive files.

```
<course advanced_modules="[&quot;google-document&quot;,
    &quot;google-calendar&quot;]" display_name="Sample Course"
    start="2014-01-01T00:00:00Z">
    ...
</course>
```

For more information, see The Courseware Structure.

Make the Google Calendar Public and Obtain Its ID

Before you can add a Google calendar to your course, you must make the calendar public and obtain its ID.

Important: The tasks described in this section rely on the use of third-party software. Because the software is subject to change by its owner, the steps provided here are intended as guidelines and not as an exact procedure.

Make the Google Calendar Public

1. Open the Google calendar.

2. From the **Settings** menu, select **Settings**.

3. Select the **Calendars** tab.

   You might have multiple calendars on the **Calendars** tab. Find the calendar that you want to share in your courseware.

4. In the row for the calendar to share, in the **Sharing** column, select **Edit Settings**.

5. Click the **Share this Calendar** tab, and then select **Make this calendar public**.
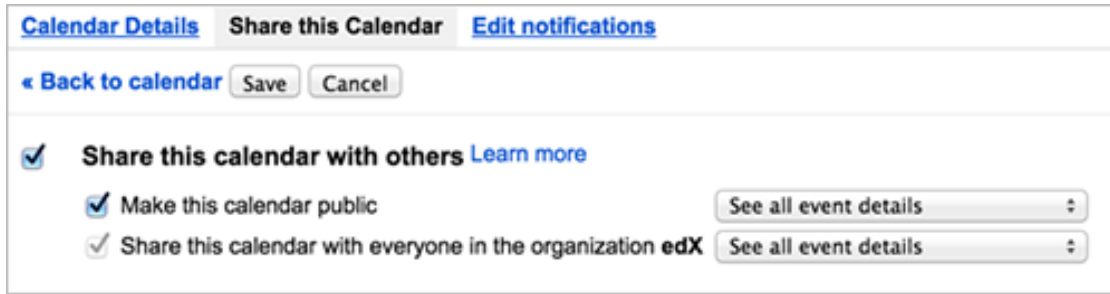
7. Select **Save**.

   The **Calendar Settings** page closes, and you return to the **Calendars** tab. You continue by *obtaining the Google calendar's ID*.

Obtain the Google Calendar ID

1. On the **Calendars** tab, click the name of the calendar.

2. Select the **Calendar Details** tab.

3. Next to the **Calendar Address** label, look to the right of the three colored **XML**, **ICAL**, and **HTML** buttons. In parentheses, you can see the calendar ID.
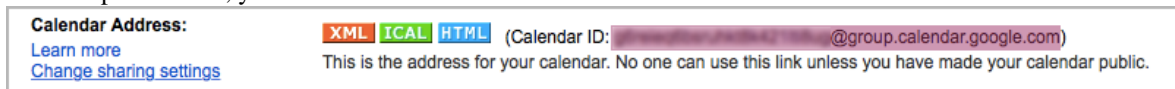
   The calendar ID resembles the following text.

   ```
   abcdefghijklmnop1234567890@group.calendar.google.com
   ```

   Select and copy the calendar ID. You use this value to configure the Google calendar component in your course.

Add a Google Calendar in the Courseware

To add a Google calendar in the courseware, you create aan advanced component in Studio or create a Google calendar XBlock in OLX.

Add a Google Calendar Component in edX Studio

Make sure that you *enable Google Calendars in your course* before you add the Google Calendar component.

To add a Google calendar component:

1. On the **Course Outline** page, open the unit where you want to add the Google calendar component.

2. Under **Add New Component** click **Advanced**, and then select **Google Calendar**.

   The new component is added to the unit, with the default edX Google calendar embedded.
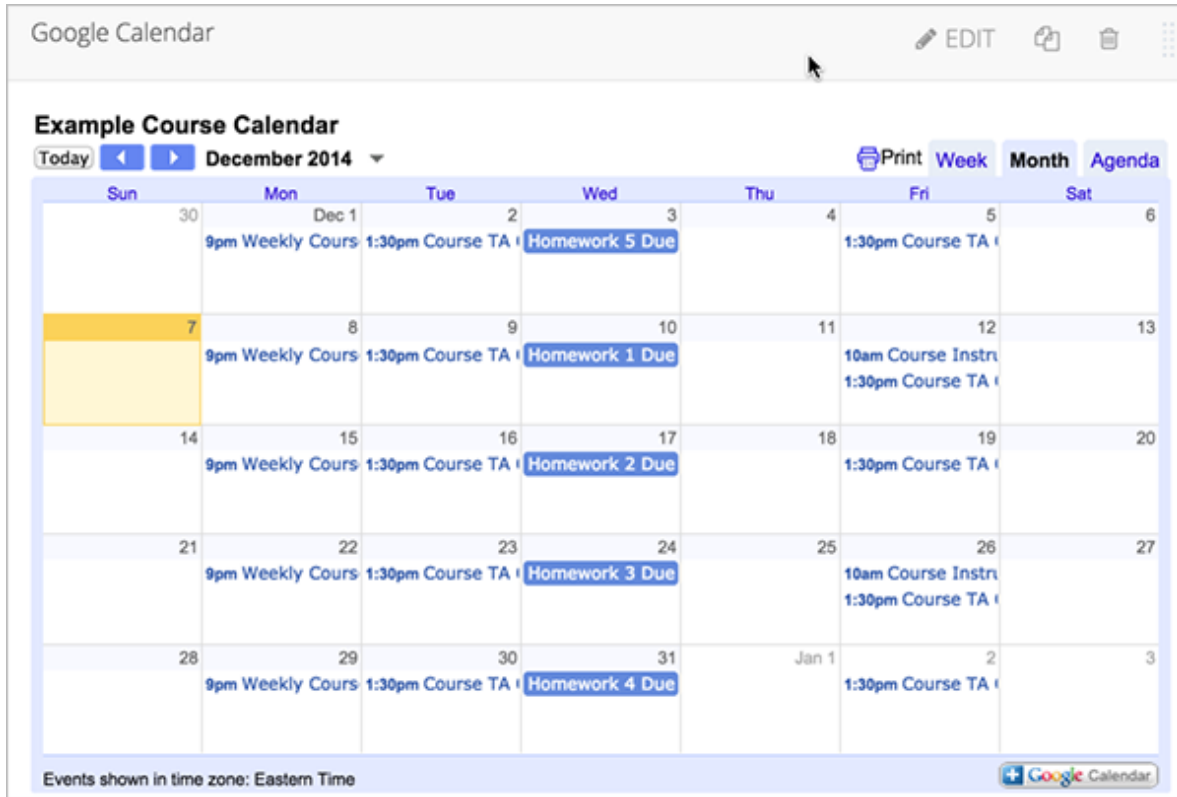
3. In the new component, select **Edit**.
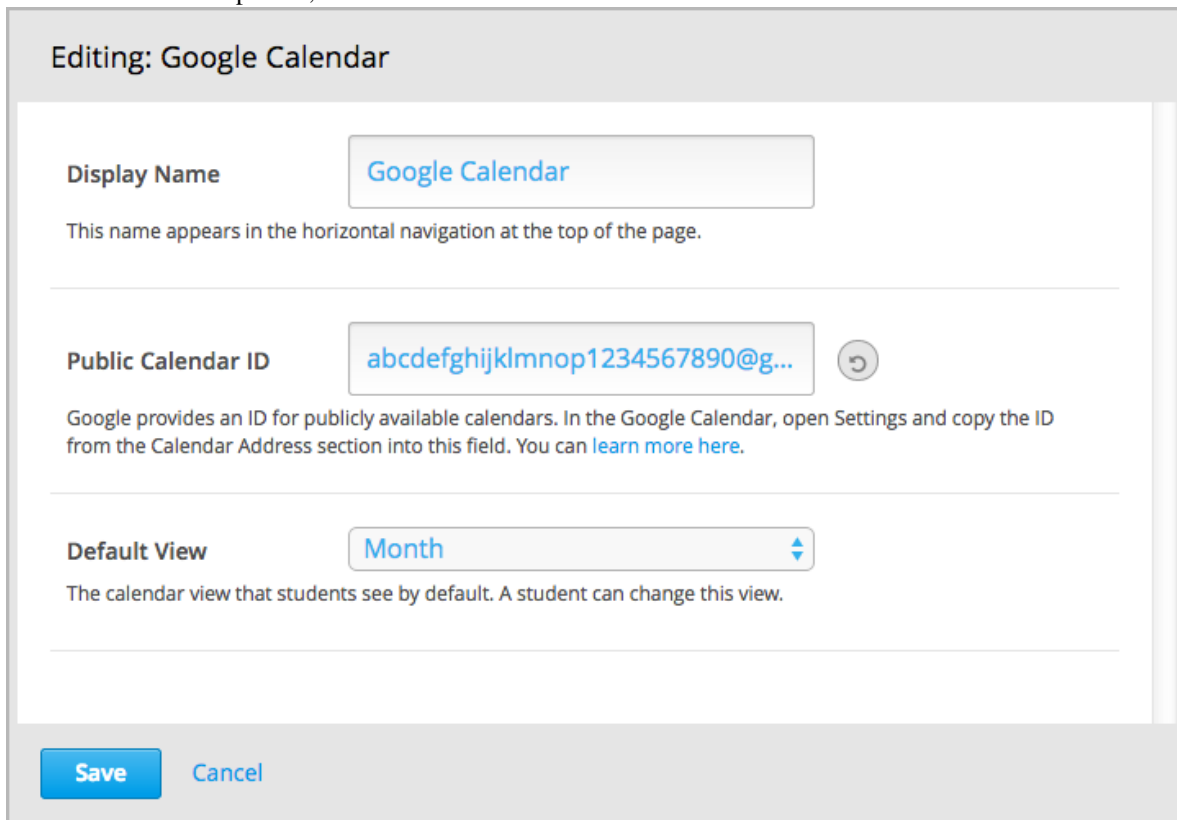
4. In the **Display Name** field, type the name for the component.

5. In the **Public Calendar ID** field, paste the calendar ID you copied in the *Obtain the Google Calendar ID* task.

6. For the **Default View** field, select **Month**, **Week**, or **Agenda**.

   This is the initial view that your students have of the calendar. Each student can change his or her view.

7. Select **Save**.

You can then *Preview Course Content* to see how the unit with the Google calendar will appear to students.

Add a Google Calendar XBlock in OLX

To add a Google calendar XBlock in OLX, create the `google-calendar` element. You can embed this element in the `vertical` element, or you can embed this element in its own file that is referenced within the vertical. For more information, see The Courseware Structure.

For example:

```
<google-calendar url_name="4115e717366045eaae7764b2e1f25e4c"
  calendar_id="abcdefghijklmnop1234567890@group.calendar.google.com"
  default_view="1" display_name="Class Schedule"/>
```

The value of the `calendar_id` attribute is the calendar ID that you copied in the *Obtain the Google Calendar ID* task.

Note: The edX Learning Management System sets the height and width values for Google Calendars. If you add these attributes, the LMS overrides your changes.

7.13.3 Editing Google Calendars

When you make changes to a Google calendar that is embedded in your course, students see the updates immediately. You make changes to calendars with the Google user interface. You do not need to edit the Google Calendar component.

7.14 Google Drive Files Tool

This chapter describes how to embed Google Drive files, such as documents, spreadsheets, and images, in your course. For more information, see any of the following topics.

- *Overview*
- *Embedding a Google Drive File in Your Course*
  - *Enable Google Drive Files in Your Course*
    * *Enable Google Drive Files in edX Studio*
    * *Enable Google Drive Files in OLX*
  - *Obtain the Google Drive File Embed Code*
  - *Add a Google Drive File to Your Course*
    * *Add a Google Drive File Component in edX Studio*
    * *Add a Google Drive File XBlock in OLX*
- *Editing Google Drive Files*

You can also use *Google calendars* in courseware. For more information, see *Google Calendar Tool*.

Note: Google services are not available in some regions and countries. If Google services are not available in a learner's area, the learner might see an "image unavailable" message in the place of the Google Drive file or calendar. We strongly suggest that you provide alternative resources for learners in these areas.

7.14.1 Overview

You can embed a Google Drive file in your course so that students see the file in the courseware. For example, you can share a Google spreadsheet with students.

You can embed the following types of Google Drive files.

- Google Docs (text documents)
- Google Drawings (images)
- Google Forms (forms or surveys)
- Google Slides (presentations)
- Google Sheets (spreadsheets)

7.14.2 Embedding a Google Drive File in Your Course

Embedding a Google Drive file in your course has three steps:

1. *Enable Google Drive files in your course* by using *Studio* or *OLX*.

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2. *Obtain the Google Drive File Embed Code*.

3. *Add the Google Drive file to your course* by using *Studio* or *OLX*.

Enable Google Drive Files in Your Course

You can enable Google Drive files in the course by using either Studio or OLX.

Enable Google Drive Files in edX Studio

To enable Google Drive files in your course:

1. From the **Settings** menu, select **Advanced Settings**.

2. In the **Advanced Module List** field, place your cursor between the braces, and then type
   `"google-document"`. If you see other values in this field, add a comma after the closing quotation mark for
   the last value, and then type `"google-document"`. For example:
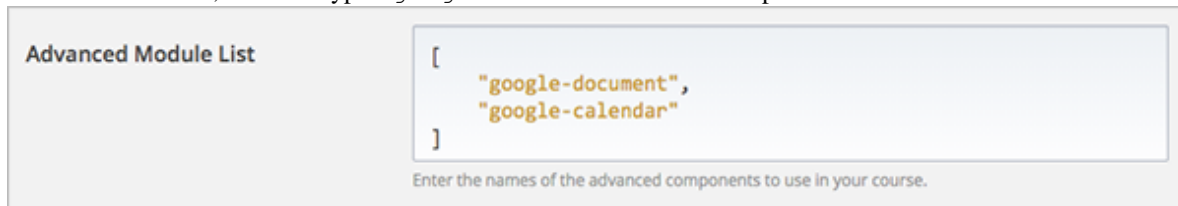
3. At the bottom of the page, select **Save Changes**.

Enable Google Drive Files in OLX

To enable Google Drive files in your course, you edit the XML file that defines the course structure. You locate the
`course` element's `advanced-modules` attribute, and add the string `google-document` to it.

For example, the following XML code enables Google Drive files in a course. It also enables Google calendars.

```
<course advanced_modules="[&quot;google-document&quot;,
    &quot;google-calendar&quot;]" display_name="Sample Course"
    start="2014-01-01T00:00:00Z">
    ...
</course>
```

For more information, see The Courseware Structure.

Publish the Google Drive File and Obtain the Embed Code

Before you can add a Google Drive file to your course, you must publish the file to the web and obain the embed code
for the file.

Important: The task described in this section relies on the use of third-party software. Because the software is
subject to change by its owner, the steps provided here are intended as guidelines and not as an exact procedure.

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1. Open the Google Drive file.

2. From the **File** menu, select **Publish to the web**.
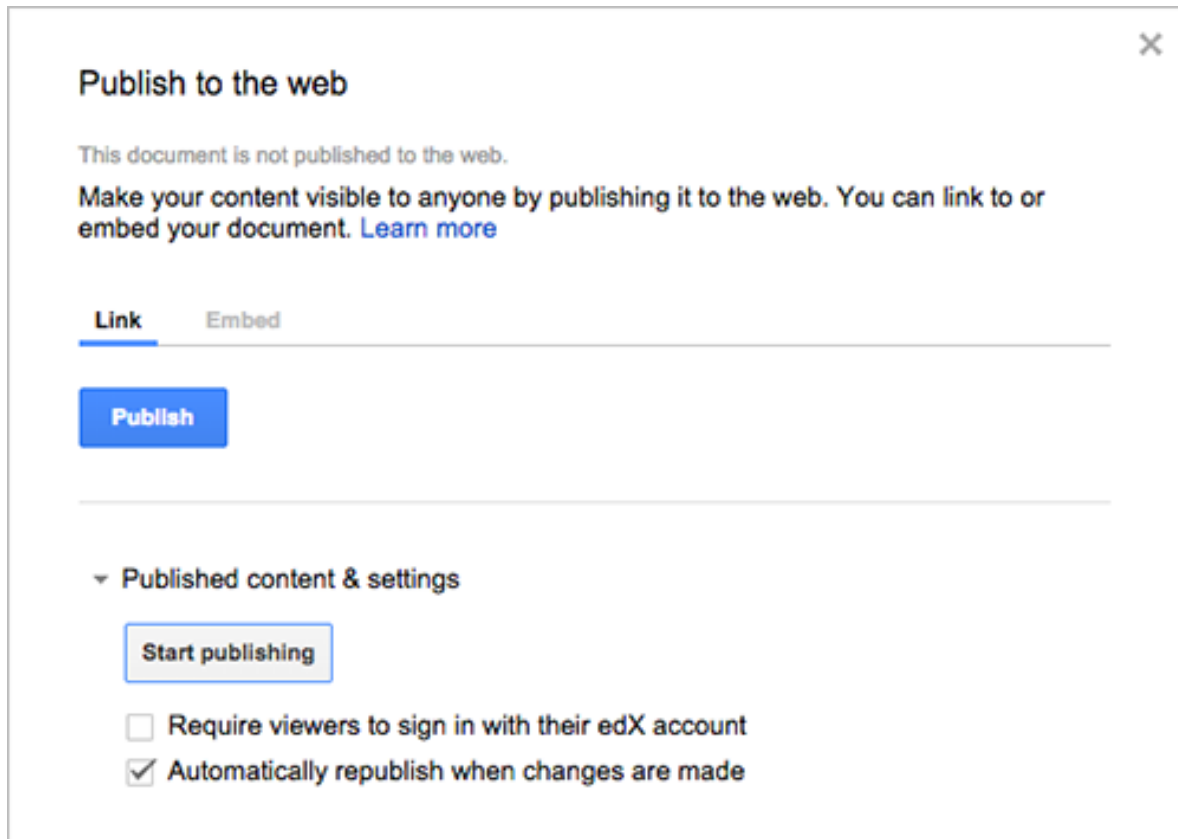
3. Click **Publish**, then select **OK** to confirm the action.

4. Click the **Embed** tab.
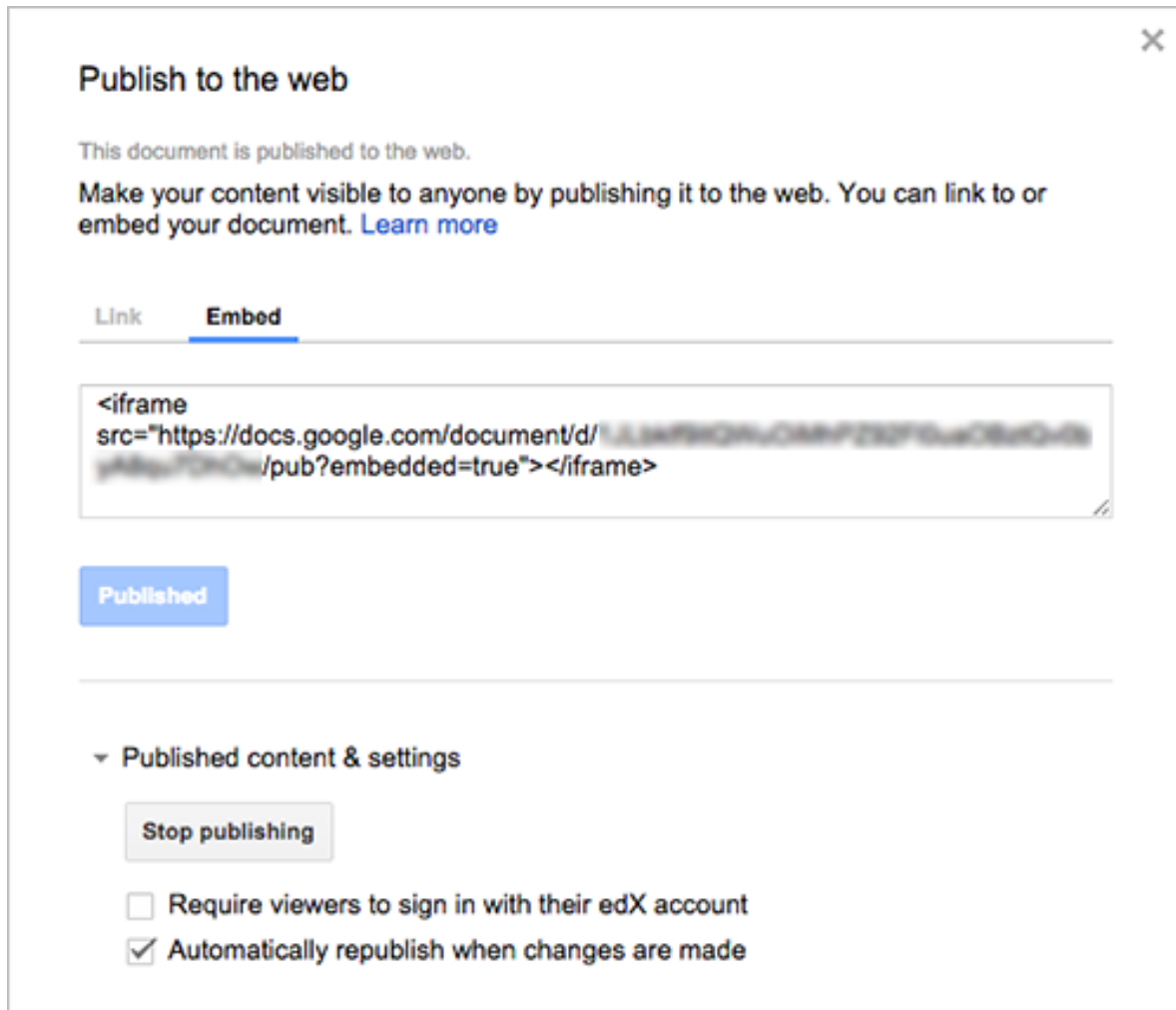
5. Copy the complete string in the **Embed** field, including the `<iframe>` tags.

Note: Google images do not have an `<iframe>` tag. To embed an image, you copy the complete `img` tag.

You use that string to configure the Google Drive file component.

Add a Google Drive File to Your Course

To add a Google Drive file in the courseware, you create an advanced component in Studio or create a Google Document Xblock in OLX.

Add a Google Drive File Component in edX Studio

Ensure you *enable Google Drive files* before you add the component.

To add a Google Drive file component:

1. On the Course Outline page, open the unit where you want to add the Google Drive component.

2. Under **Add New Component** click **Advanced**, and then select **Google Document**.

   The new component is added to the unit, with the default Google presentation embedded.
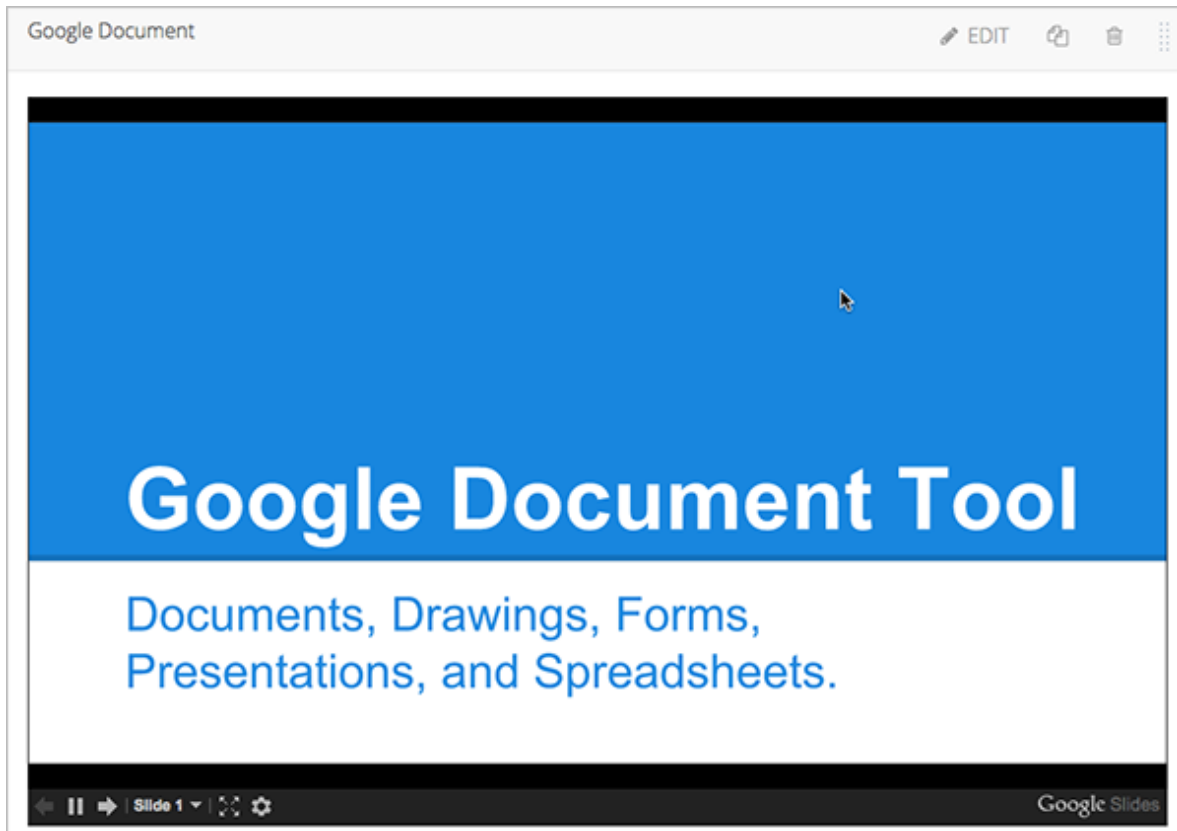
---

3. In the new component, select **Edit**.
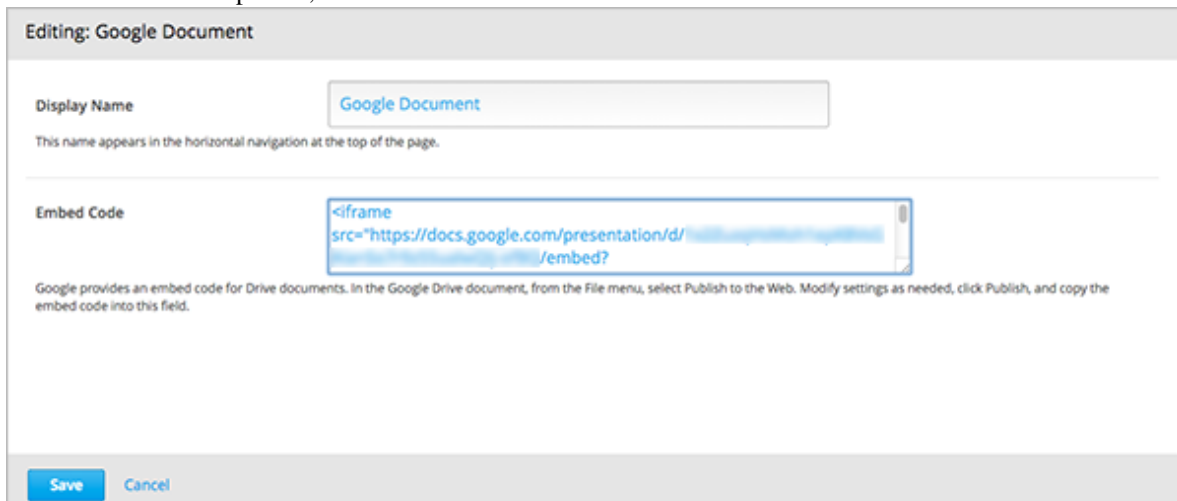
4. In the **Display Name** field, type the name for the component.

5. In the **Embed Code** field, paste the embed code you copied in the *Obtain the Google Drive File Embed Code* task.

6. Click **Save**.

You can then *Preview Course Content* to see how the unit with the Google drive file will appear to students.

Add a Google Drive File XBlock in OLX

To add a Google Drive file XBlock in OLX, you create the `google-document` element. You can embed the `google-document` element in the `vertical` element, or you can create the `google-document` element as a stand-alone file that you reference in the vertical.

For more information, see The Courseware Structure.

For example:

```
<google-document url_name="c5804436419148f68e2ee44abd396b12"
  embed_code="&lt;iframe
  frameborder=&quot;0&quot; src=&quot;https://docs.google.com/spreadsheet/pub
  ?key=0AuZ_5O2JZpH5dGVUVDNGUE05aTFNcEl2Z0ZuTUNmWUE&amp;output=html&amp;widge
  t=true&quot;&gt;&lt;/iframe&gt;" display_name="Google Document"/>
```

The value of the `embed_code` attribute is the embed code you copied in the *Obtain the Google Drive File Embed Code* task.

Note: The edX Learning Management System sets the height and width values for Google Drive files. If you add these attributes, the LMS overrides your changes.

7.14.3 Editing Google Drive Files

When you edit and save a Google Drive file that is embedded in your course, students see the updates immediately. You make changes to files with the Google user interface. You do not need to edit the Google Document component.

7.15 Google Instant Hangout Tool

This topic describes how you can use instant hangouts in your course. See:

- *Overview*
- *Whitelisting Your Domain for Google Hangouts*
- *Instant Hangouts in Your Course*
- *The Learner Experience*
- *Limitations*
- *Create the Instant Hangout*

7.15.1 Overview

You can add the ability for learners to participate in instant hangouts directly from your course.

With instant hangouts, learners can:

- Interact through live video and voice.
- Share screens and watch videos together.
- Collaborate on documents.

For a full list of instant hangout features, see the Google Hangouts page.

Note: Learners who want to participate in instant hangouts must have a Google account. You should note this in your course materials.

7.15.2 Whitelisting Your Domain for Google Hangouts

If you are running an Open edX site, you must ensure that Google whitelists the site's domain as a referrer for Google Hangouts to work.

7.15.3 Instant Hangouts in Your Course

You can add one or more instant hangouts in your course. For example, you can add an instant hangout in the following places.

- In a page, to provide learners with a hangout for the entire course. See *Adding Pages to a Course* for more information.

- In an HTML component, to provide a hangout for learners working on that specific course unit. See *Working with HTML Components* for more information about creating HTML components.

An instant hangout is specific to the page it is opened from. For example, learners who join a hangout from one course unit interact among themselves, while learners who join a hangout from another unit interact in a different hangout.

7.15.4 The Learner Experience

When you add the instant hangout to your course, a control for the hangout appears on that page. The following example shows the control in a course unit. The control shows that the learner can start the hangout and be the first participant.
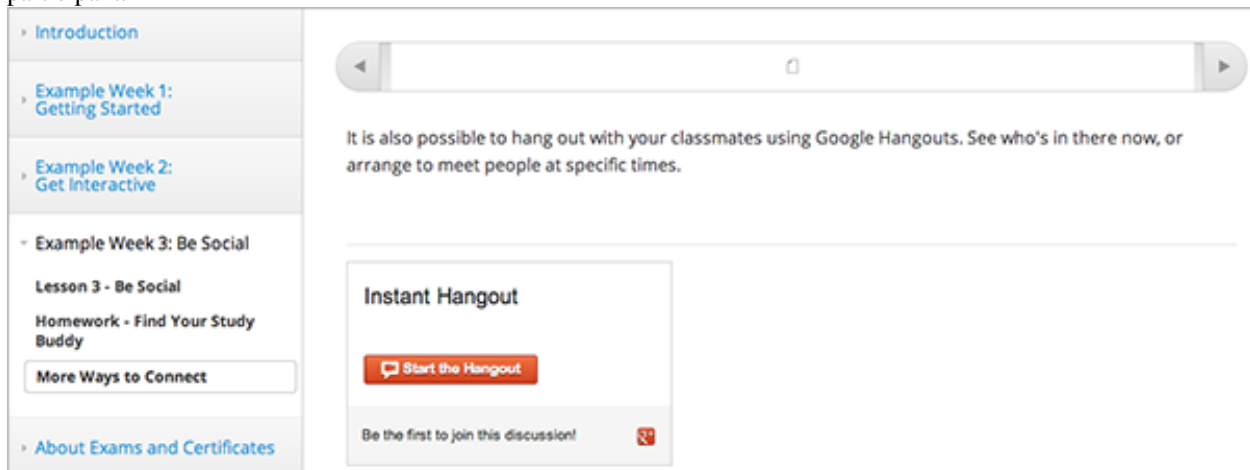
To start the hangout, the learner selects **Start the Hangout**. (After the first learner selects **Start the Hangout**, other learners see a **Join the Hangout** button.)

The following example shows the control in a page when a hangout has already started. The control has a **Join the Hangout** button, and shows that one other learner is already in the hangout.
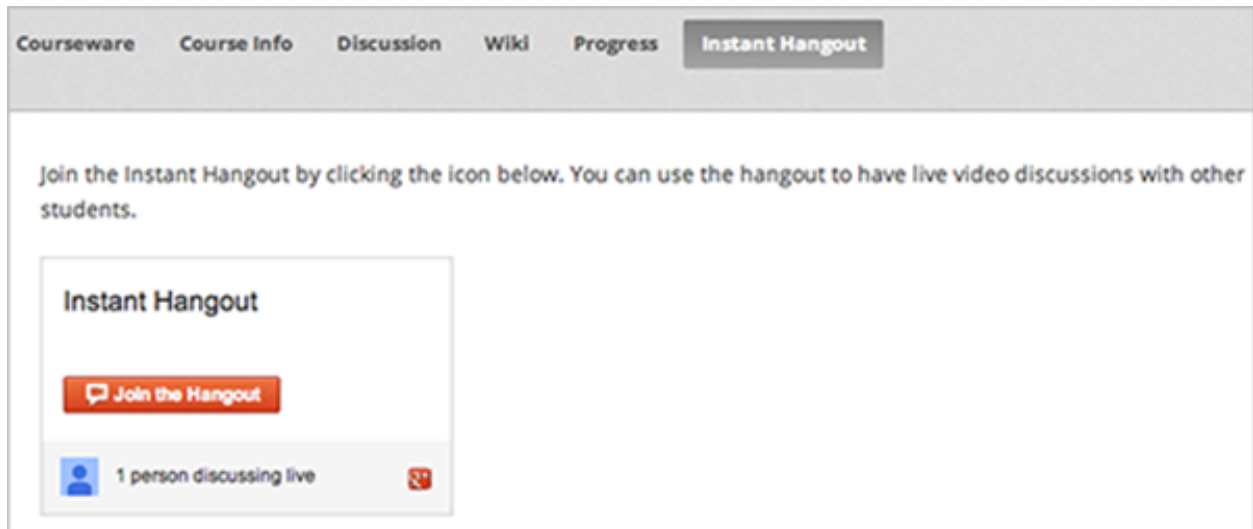
To join the hangout, the learner selects **Join the Hangout**.

If not already logged in, the learner is prompted to log in to Google:
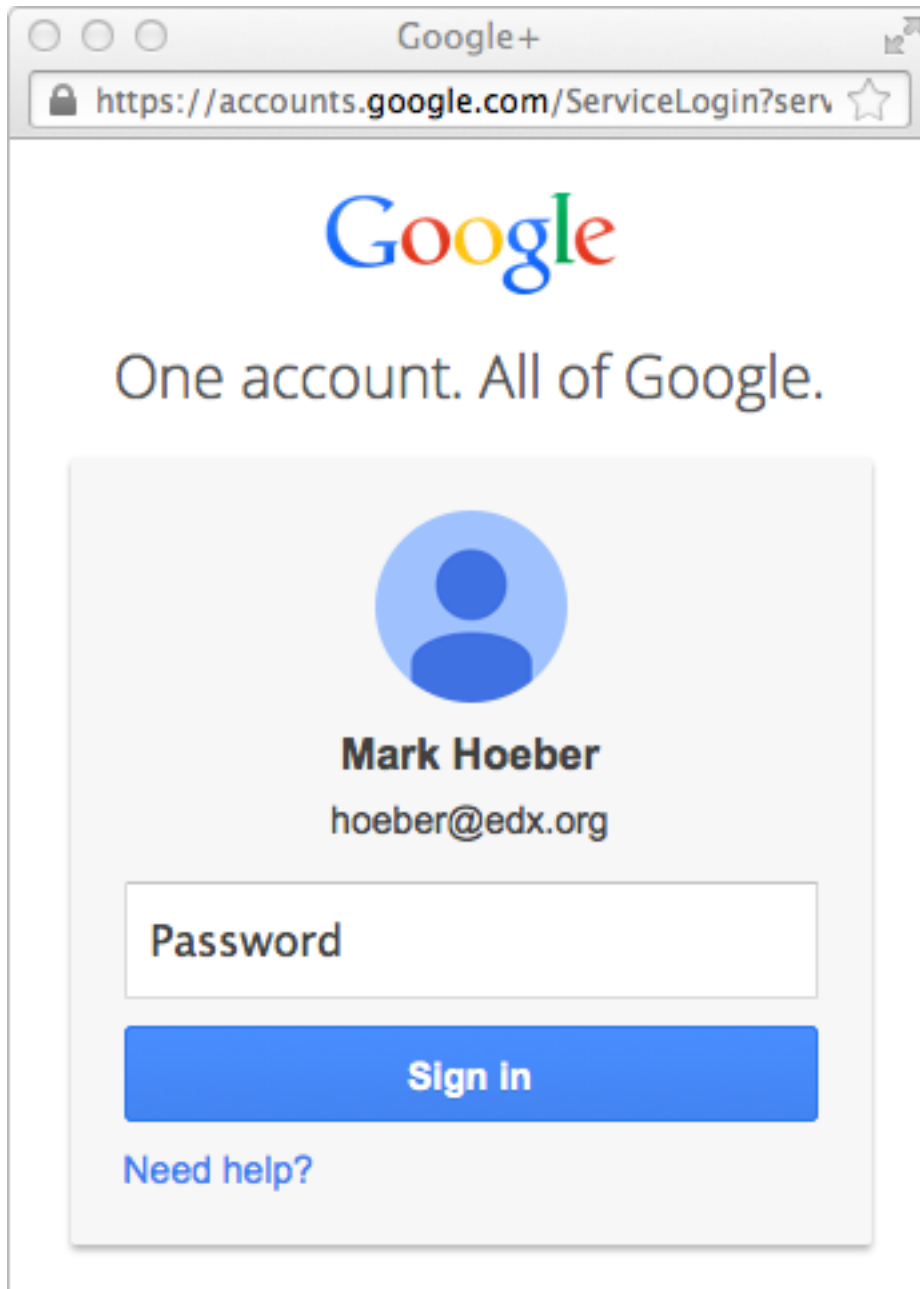
Learners who do not have a Google account can create one from the login page.

After the learner has logged in to Google, the hangout opens in a separate browser window:
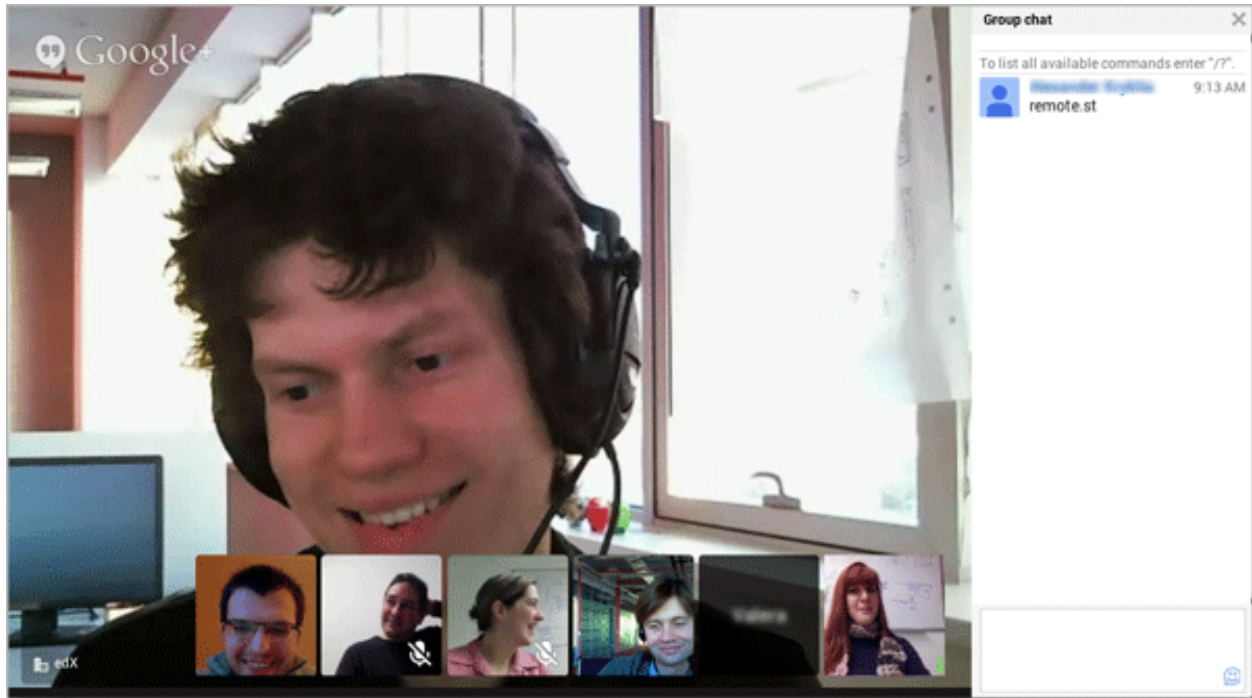
7.15.5 Limitations

Currently, only ten learners can join a single instant hangout. You should note this in your course materials.

Learners in hangouts that are started from different pages in your course are counted separately. So you can have ten learners participating in a hangout started from one unit, and ten other learners in a hangout started from a different unit.

7.15.6 Create the Instant Hangout

To create an instant hangout in your course:

1. Get the instant hangout JavaScript file from GitHub.

2. Copy the text of this file into a text editor on your computer, and save the file as a JavaScript file (that is, when you save the file, change the extension from .txt to .js).

   Note: Make sure that you copy the raw GitHub file, which does not contain formatting. Do not copy the formatted file. Any formatting will cause the JavaScript to not work correctly.

3. Upload the JavaScript file to the **Files & Uploads** page in your course. See *Adding Files to a Course* for more information.

4. In either a page or an HTML component, open the HTML editor.

5. On the first line, add the JavaScript file you uploaded in a <script> tag, making sure you use full opening and closing tags.

   For example, if your JavaScript file is named **instanthangouts-0.1.0.js**, you would enter the following:

   ```
   <script src='/static/instanthangouts-0.1.0.js'></script>
   ```

6. After the <script> tag, add:

```
<div class='instanthangouts'/>
```

7. Add any additional text and tags that you want.

   For example, the complete HTML could be:

```
<p>Join an instant hangout by selecting the button below. You can use the
hangout to have live video discussions with other learners.</p>
<script
src='/static/instanthangouts-0.1.0.js'></script>
<div class='instanthangouts'/>
```

8. Test the instant hangout in your course.

Updating the JavaScript File

Google will periodically update the instant hangouts JavaScript file. To receive update notifications, go to the instant hangouts repository page, and then select **Watch** in the upper-right area of the page.

To use an updated JavaScript file in your course, we recommend that you copy the JavaScript from the repository into a file that has the same name as the file that you uploaded to your course. When you upload the new file, the new file replaces the previous file.

> **Warning:** If you include version numbers in the file names of uploaded files, you will have to edit any HTML components or pages that include an instant hangout control every time that you update the JavaScript file.

7.16 IFrame Tool

An IFrame allows you to integrate ungraded exercises and tools from any Internet site into the body of your course. The IFrame appears inside an HTML component, and the exercise or tool appears inside the IFrame. IFrames can include your own tools or third-party tools.
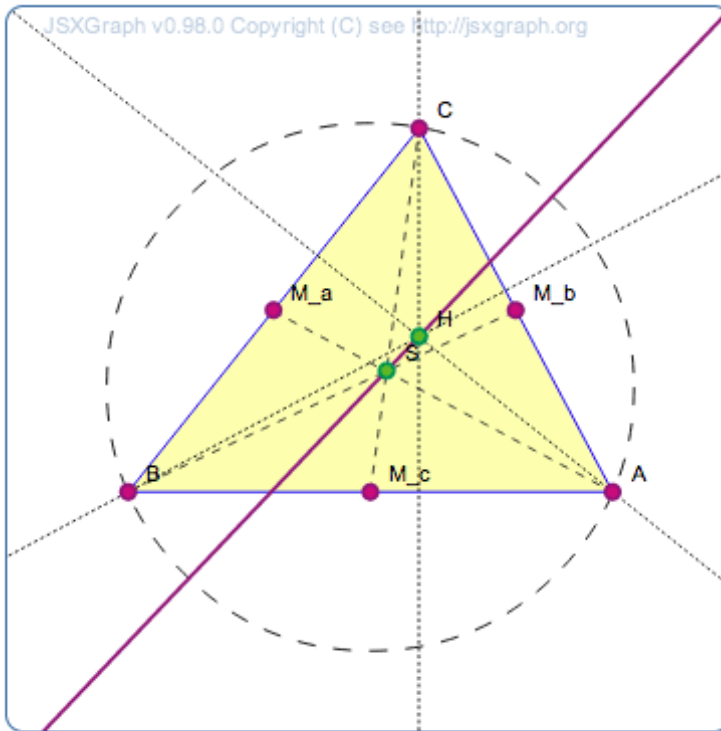
IFrames are well-suited for tools that demonstrate a concept but that won't be graded or store student data. If you want to add a graded tool or exercise, add the tool as a *custom JavaScript problem* or an *LTI component*.

For more information about IFrames, see the IFrame specification.

7.16.1 Create an IFrame Tool

To add an exercise or tool in an IFrame, you'll create an IFrame HTML component and add the URL of the page that contains the exercise or tool to the component. You can also add text and images both before and after the IFrame.

Note: The URL of the page that contains the exercise or tool must start with `https` instead of `http`. If the URL starts with `http`, you have to work with the owner of that page to find out if an `https` version is available. Some websites do not allow their content to be embedded in IFrames.

---

1. Under **Add New Component**, click **html**, and then click **IFrame**.

2. In the new component that appears, click **Edit**.

3. In the toolbar in the component editor, click **HTML**.

4. In the HTML source code editor, locate the following HTML (line 7). This HTML includes the `<iframe>` element:

```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html" width="402" heigh
```

5. Replace the default URL in the **src** attribute (**https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html**) with the URL of the page that contains the exercise or tool. **This URL must start with https**. Make sure you don't delete the quotation marks that surround the URL.

6. Change the attributes in the IFrame element to specify any other settings that you want. For more information about these settings, see *IFrame Settings*. You can also change the text between the opening and closing `<iframe>` tags. A student only sees this text if the student uses a browser that does not support IFrames.

7. Click **OK** to close the HTML source code editor and return to the Visual editor.

8. In the Visual editor, replace the default text with your own text.

9. Click **Save**.

IFrame Settings

To specify settings for your IFrame, you'll add, remove, or change the attributes inside the opening `<iframe>` tag. The `<iframe>` tag **must** contain a **src** attribute that specifies the URL of the web page you want. Other attributes are optional.

You can add these attributes in any order you want.

Attribute	Description
src (required)	Specifies the URL of the page that contains the exercise or tool.
width and **height** (optional)	Specify the width and height of the IFrame, in pixels or as a percentage. To specify the value in pixels, enter numerals. To specify a percentage, enter numerals followed by a percent sign.
	If you don't specify the width and height, the IFrame uses the dimensions that the linked page has set. These dimensions vary by website. If you change the width and height of the IFrame, the content from the linked page may be resized, or only part of the content may appear.
marginwidth and **marginheight** (optional)	Specify the size of the space between the edges of the IFrame and your exercise or tool, in pixels.
frameborder (optional)	Specifies whether a border appears around your IFrame. If the value is 0, no border appears. If the value is any positive number, a border appears.
scrolling (optional)	Specifies whether a scrollbar appears to help users see all of the IFrame's content if your IFrame is smaller than the exercise or tool it contains. For example, if the content in your IFrame is very tall, you can set the IFrame's height to a smaller number and add a vertical scroll bar for users, as in the first image below.

For example, compare how the different settings in each of the `<iframe>` elements below affect the IFrame.

```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html" width="442" height="20
```

In the image below, drag any of the red points to a new location. As you drag the point, notice the way the point's position affects the triangle's Euler line.

```
<p><iframe src="https://studio.edx.org/c4x/edX/DemoX/asset/eulerLineDemo.html" width="550" height="25
```
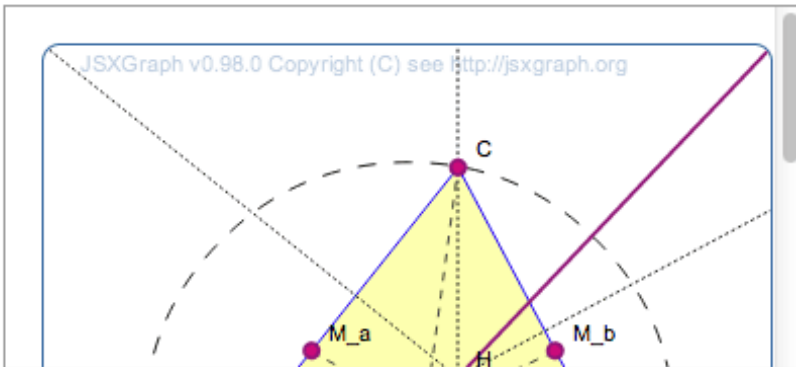
In the image below, drag any of the red points to a new location. As you drag the point, notice the way the point's position affects the triangle's Euler line.
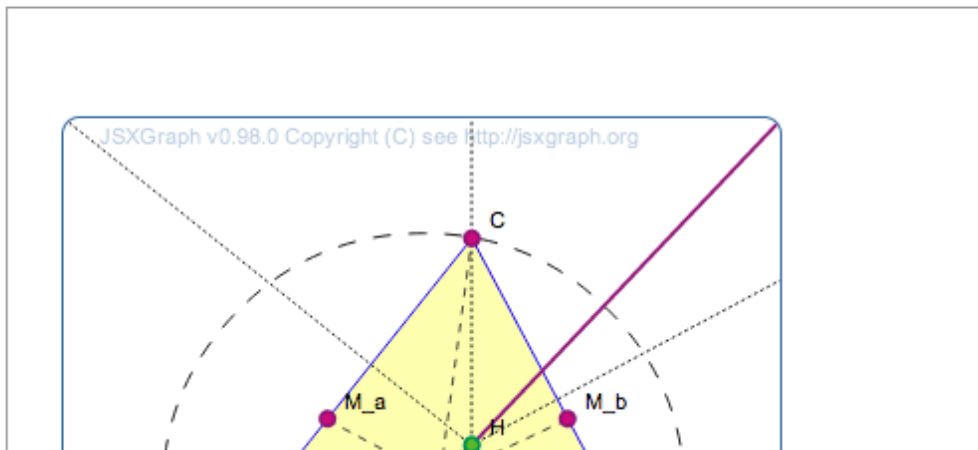
For more information about IFrame attributes, see the IFrame specification.

7.17 Image Mapped Input Problem

In an image mapped input problem, also known as a "pointing on a picture" problem, students click inside a defined region in an image. You define this region by including coordinates in the body of the problem.

What country is home to the Pyramids as well as the cities of Cairo and Memphis? Click the country on the map below.

✔

EXPLANATION

Egypt is home to not only the Pyramids, Cairo, and Memphis, but also the Sphinx and the ancient Royal Library of Alexandria.

[Check] [Hide Answer]

You can specify the following types of regions.

- One rectangular region. For more information, see *Specify a Rectangular Region*.
- Multiple rectangular regions. For more information, see *Specify Multiple Rectangular Regions*.

• One non-rectangular region. For more information, see *Specify an Irregular Region*.

Note: When you create a problem that contains an image, you must include alt text for your image to make the image accessible. For more information about alt text, see *Use Best Practices for Describing Images*.

7.17.1 Create an Image Mapped Input Problem

To create an image mapped input problem, follow these steps.

1. *Collect the information that you need for the image*.

2. *Create the problem in Studio*.

Collect Image Information

To create an image mapped input problem, you need the following elements.

• The height and width of the image in pixels.

• Coordinate pairs that define the region or regions where you want students to click.

To collect the information you need about your image, use an image editing tool such as Microsoft Paint.

Note: The coordinate pairs for all images start with (0,0) in the upper-left corner of the image and increase in value toward the lower-right corner, similar to the progression of reading English.

• To specify a rectangular region, you need two coordinate pairs: the upper-left corner and the lower-right corner.

• To specify more than one rectangle, you need the coordinate pairs for the upper-left and lower-right corners of each rectangle.

• To specify an irregular region, you need three or more coordinate pairs. Studio creates the simplest possible shape based on these coordinate pairs. You can enter the coordinate pairs in any order.

For example, for a triangle, you need three coordinate pairs. For an octagon, you need eight coordinate pairs.

Create the Problem in Studio

1. In Studio, upload your image to the **Files & Uploads** page, and make a note of the file path for the image. For more information, see *Adding Files to a Course*.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Image Mapped Input**.

4. In the component that appears, click **Edit**.

5. In the component editor, replace the example problem text with your own text.

6. In the `<imageinput>` element, follow these steps.

   (a) Replace the example file path in the `src` attribute with the file path for your image.

   (b) Include alt text for your image to make the image accessible. For more information about alt text, see *Use Best Practices for Describing Images*.

   (c) Replace the example values for the `width` and `height` attributes with the dimensions for your image.

(d) Modify the example `rectangle` attribute to reflect the shape and size of the region that you want to specify. For more information, see *Specify a Rectangular Region*, *Specify Multiple Rectangular Regions*, or *Specify an Irregular Region*.

7. Click **Save**.

Specify a Rectangular Region

To specify a rectangular region, edit the `rectangle` attribute in the `<imageinput>` element.

- Specify the coordinate pair for the upper-left and lower-right corners of the rectangle, separating the x and y values with a comma.

- Surround each coordinate pair with parentheses.

- Use a hyphen to separate the coordinate pairs.

- Surround the set of coordinate pairs with quotation marks (").

For example, the following `rectangle` attribute creates one rectangle from two coordinate pairs:

`rectangle="(338,98)-(412,168)"`

Problem Code:
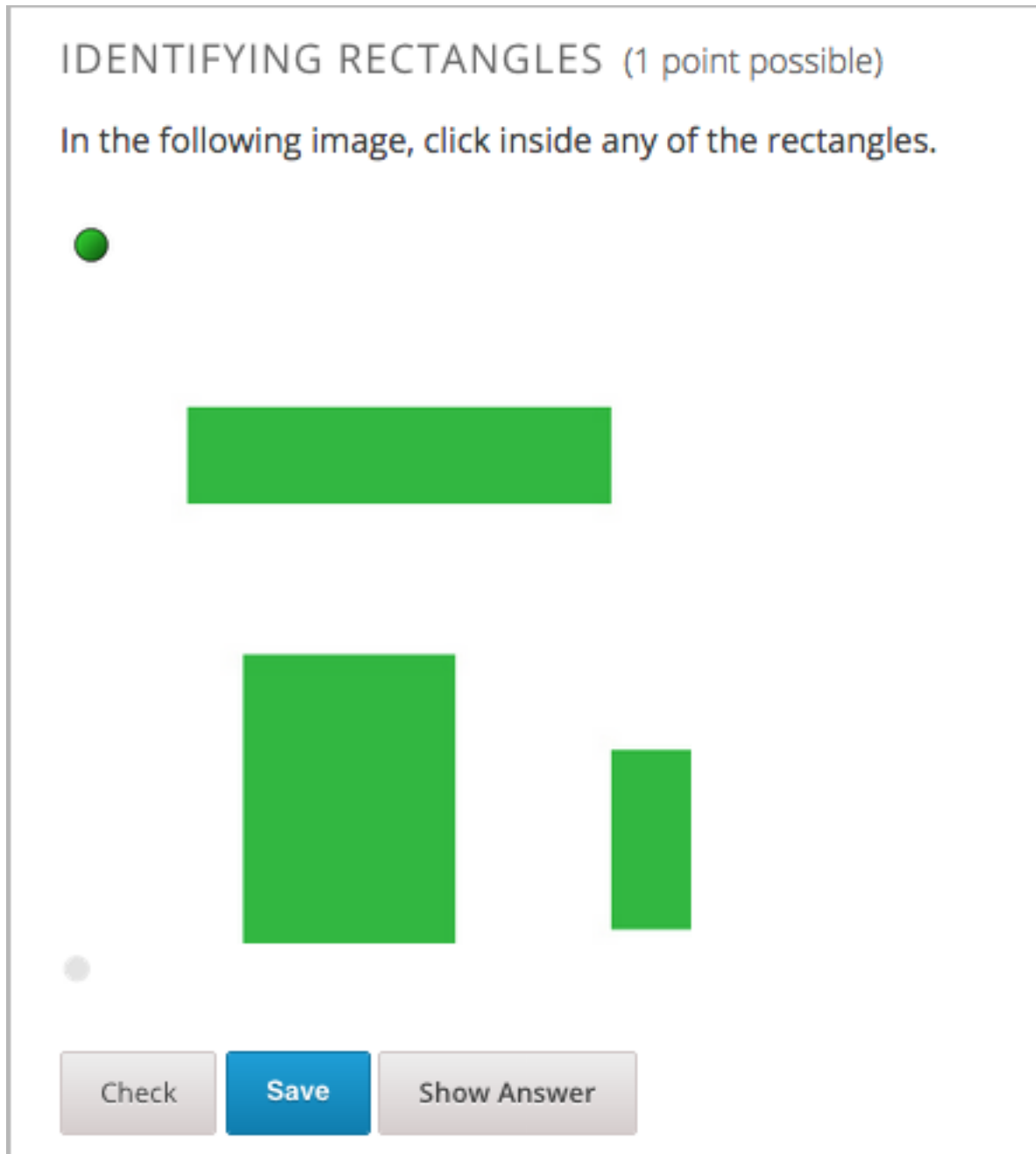
```
<problem>

<p>What country is home to the Pyramids as well as the cities of
Cairo and Memphis? Click the country on the map below.</p>

<imageresponse>
  <imageinput src="/static/Africa.png" width="600" height="638"
rectangle="(338,98)-(412,168)" alt="Map of Africa" />
</imageresponse>

<solution>
  <div class="detailed-solution">

    <p>Explanation</p>

    <p>Egypt is home to not only the Pyramids, Cairo, and Memphis, but also the
Sphinx and the ancient Royal Library of Alexandria.</p>

  </div>
</solution>

</problem>
```

Specify Multiple Rectangular Regions

You can specify more than one rectangular region in an image.

To specify multiple rectangular regions, edit the `rectangle` attribute in the `<imageinput>` element.

- Specify the coordinate pair for the upper-left and lower-right corners of each rectangle, separating the x and y values with a comma.

- Surround each coordinate pair with parentheses.

- Use a hyphen (-) to separate the coordinate pairs.

- Separate each rectangle with a semicolon (;).

- Surround the entire set of coordinates with quotation marks (").

For example, the following `rectangle` attribute creates three rectangles:

```
rectangle="(62,94)-(262,137);(306,41)-(389,173);(89,211)-(187,410)"
```

Problem Code:

```
<problem>

 <p>In the following image, click inside any of the rectangles.</p>

   <imageresponse>

     <imageinput src="/static/imageresponse_multipleregions.png" width="450"
       height="450" rectangle="(62,94)-(262,137);(306,41)-(389,173);(89,211)-
       (187,410)" alt="Three rectangles on a white background" />

   </imageresponse>

</problem>
```

Specify an Irregular Region

You can specify one non-rectangular region.

To specify an irregular region, edit the `rectangle` attribute in the `<imageinput>` element.

- Change `rectangle` to `region`.

- Specify three or more coordinate points in any order.

- Enter each coordinate pair in brackets ([]). **Do not use parentheses**.

- Separate each set of points with a comma (,) and a space.

- Enclose the whole list of coordinate points in brackets ([]).

- Surround the outer brackets with quotation marks (").

For example, the following `regions` attribute creates a pentagon.

```
regions="[[219,86], [305,192], [305,381], [139,381], [139,192]]"
```

Problem Code:

```
<problem>

 <p>In the following image, click inside the pentagon.</p>

 <imageresponse>

   <imageinput src="/static/imageresponse_irregularregions.jpg" width="600"
   height="204" regions="[[219,86], [305,192], [305,381], [139,381],
   [139,192]]" alt ="A series of 10 shapes including a circle, triangle,
   trapezoid, pentagon, star, and octagon" />

 </imageresponse>

</problem>
```

7.17.2 Image Mapped Input Problem XML

Template

```
<problem>

  <p>Problem text</p>

      <imageresponse>

       <imageinput src="IMAGE FILE PATH" width="NUMBER" height="NUMBER"
       rectangle="(X-AXIS,Y-AXIS)-(X-AXIS,Y-AXIS)" alt="DESCRIPTION OF
       IMAGE" />

      </imageresponse>

</problem>
```

Tags

- `<imageresponse>`: Indicates that the problem is an image mapped input problem.
- `<imageinput>`: Specifies the image file and the region in the file that the student must click.

Tag: `<imageresponse>`

Indicates that the problem is an image mapped input problem.

> Attributes
>
> (none)
>
> Children
>
> > - `<imageinput>`

Tag: `<imageinput>`

Specifies the image file and the region in the file where students must click.

Attributes

Attribute	Description
`src` (required)	The URL of the image
`height` (required)	The height of the image, in pixels
`width` (required)	The width of the image, in pixels
`rectangle` (required) (or, for irregular regions, `region`)	An attribute with two or more coordinate pairs that define the region where students should click
`alt` (required)	A description of the image, used for accessibility

Children

(none)

7.18 LTI Component

You might have discovered or developed an external learning application that you want to add to your online course. Or you might have a digital copy of your textbook that uses a format other than PDF. You can add external learning applications or textbooks in Studio by using a learning tools interoperability (LTI) component. The LTI component is based on the IMS Global Learning Tools Interoperability version 1.1.1 specifications.

You can use an LTI component in several ways.

- You can add external LTI content that is only displayed and does not require a student response, such as textbook content.

- You can add external LTI content that requires a student response. An external provider will grade student responses.

- You can use the component as a placeholder for syncing with an external grading system.

For example, the following LTI component incorporates a Cerego tool that students interact with.

7.18.1 Obtain LTI Information

Before you create an LTI component from an external LTI provider in a unit, you need the following information.

- The **launch URL** (if the LTI component requires a student response that will be graded). You obtain the launch URL from the LTI provider. The launch URL is the URL that Studio sends to the external LTI provider so that the provider can send back students' grades.

- The **LTI Passports** policy key. This policy key has three parts: an LTI ID, a client key, and a client secret.

    - The **LTI ID**. This is a value that you create to refer to the external LTI provider. You should create an LTI

ID that you can remember easily.

The LTI ID can contain uppercase and lowercase alphanumeric characters, as well as underscore characters (_). It can be any length. For example, you can create an LTI ID that is as simple as **test_lti_id**, or your LTI ID can be a string of numbers and letters such as **id_21441** or **book_lti_provider_from_new_york**.

– The **client key**. This value is a sequence of characters that you obtain from the LTI provider. The client key is used for authentication and can contain any number of characters. For example, your client key may be **b289378-f88d-2929-ctools.school.edu**.

– The **client secret**. This value is a sequence of characters that you obtain from the LTI provider. The client secret is used for authentication and can contain any number of characters. For example, your client secret can be something as simple as **secret**, or it may be a string of numbers and letters such as **23746387264** or **yt4984yr8**.

To create the **LTI Passports** policy key, combine the LTI ID, client key, and client secret in the following format (make sure to include the colons).

```
lti_id:client_key:client_secret
```

For example, an **LTI Passports** policy key can resemble any of the following.

```
test_lti_id:b289378-f88d-2929-ctools.school.edu:secret
```

```
id_21441:b289378-f88d-2929-ctools.school.edu:23746387264
```

```
book_lti_provider_from_new_york:b289378-f88d-2929-ctools.company.com:yt4984yr8
```

7.18.2 Create an LTI Component

Creating an LTI component in your course has three steps.

1. Add LTI to the **Advanced Module List** policy key.

2. Register the LTI provider.

3. Create the LTI component in an individual unit.

Step 1. Add LTI to the Advanced Module List Policy Key

1. On the **Settings** menu, click **Advanced Settings**.

2. In the field for the **Advanced Module List** policy key, place your cursor between the brackets.

3. Enter "`lti`". Make sure to include the quotation marks, but not the period.

Note: If the **Advanced Module List** field already contains text, place your cursor directly after the closing quotation mark for the final item, and then enter a comma followed by "`lti`" (make sure that you include the quotation marks).

4. At the bottom of the page, click **Save Changes**.

The page refreshes automatically. At the top of the page, you see a notification that your changes have been saved.

Step 2. Register the External LTI Provider

To register the external LTI provider, you'll add the **LTI Passports** policy key to the course's advanced settings.

1. On the **Advanced Settings** page, locate the **LTI Passports** policy key.

2. Place your cursor between the brackets.

3. Enter the **LTI Passports** policy key surrounded by quotation marks.

   For example, the text in the **LTI Passports** field can resemble the following.

   ```
   "test_lti_id:b289378-f88d-2929-ctools.umich.edu:secret"
   ```

   If you have multiple LTI providers, separate the values for each **LTI Passports** policy key with a comma. Make sure to surround each entry with quotation marks.

   ```
   "test_lti_id:b289378-f88d-2929-ctools.umich.edu:secret",
   "id_21441:b289378-f88d-2929-ctools.school.edu:23746387264",
   "book_lti_provider_from_new_york:b289378-f88d-2929-ctools.company.com:yt4984yr8"
   ```

4. At the bottom of the page, click **Save Changes**.

The page refreshes automatically. At the top of the page, you see a notification that your changes have been saved, and you can see your entries for the **LTI Passports** policy key.

Step 3. Add the LTI Component to a Unit

1. In the unit where you want to create the problem, click **Advanced** under **Add New Component**, and then click **LTI**.

2. In the component that appears, click **Edit**.

3. In the component editor, specify the settings that you want. See *LTI Component Settings* for a description of each setting.

4. Click **Save**.

Note: You cannot test the LTI component from within Studio. You must test the LTI component in Preview mode or in the live course. For more information, see *Testing Your Course Content*.

7.18.3 LTI Component Settings

Setting	Description
Accept grades past deadline	Specifies whether third party systems are allowed to post grades past the deadline. By default, this value is set to True.
Button Text	Enter a custom label for the button that launches the third-party LTI application.

Custom Parameters	Enables you to add one or more custom parameters. For example, if you added an e-book, you can set a custom parameter that opens the e-book to a specific page. You could also use a custom parameter to set the background color of the LTI component.
	Every custom parameter has a key and a value. You must add the key and value in the following format.
	`key=value`
	For example, a custom parameter may resemble the following.
	`bgcolor=red`
	
	`page=144`
	To add a custom parameter, click **Add**.

Display Name	Specifies the name of the component. This name appears as a heading above the problem and as a tooltip in the learning sequence at the top of the **Courseware** page. Unique, descriptive display names help you identify problems quickly and accurately for analysis.
Hide External Tool	Indicates whether you want to launch an external tool or to use this component as a placeholder for syncing with an external grading system. If you set the value to True, Studio hides the **Launch** button and any IFrames for this component. By default, this value is set to False.
LTI Application Information	The description of the third party application. If the application requires a username or email address, use this field to inform learners why their information will be forwarded to a third party application.
LTI ID	Specifies the LTI ID for the external LTI provider. This value must be the same LTI ID that you entered on the **Advanced Settings** page.
LTI URL	Specifies the URL of the external tool that this component launches.This setting is applicable when **Hide External Tool** is set to False.
Open in New Page	Specify whether the problem opens in a new page. If you set this value to True, the student clicks a link that opens the LTI content in a new window. If you set this value to False, the LTI content opens in an IFrame in the current page. This setting is applicable when **Hide External Tool** is set to False.
Request user's email	If **Open in New Page** is set to True, you can also request user information. Set this value to True to request the user's email address.
Request user's username	If **Open in New Page** is set to True, you can also request user information. Set this value to True to request the user's username.
Scored	Indicates whether the LTI component receives a numerical score from the external LTI system. By default, this value is set to False.
Weight	Specifies the number of points possible for the problem. By default, if an external LTI provider grades the problem, the problem is worth 1 point, and a student's score

7.19 Math Expression Input Problems

In math expression input problems, learners enter text that represents a mathematical expression. The text is converted to a symbolic expression that appears below the response field. Unlike numerical input problems, which only allow integers and a few select constants, math expression input problems can include unknown variables and more complicated symbolic expressions.

This exercise first appeared in MITx's 2.01x Elements of Structures course, spring 2013.

The composite bar BC in the figure is composed of an inner core of cross sectional area $A_2 = 1 \text{ mm}^2$ and a sleeve of cross sectional area $A_1 = 4A_2$. The Young's modulus of the sleeve is E_1 and the modulus of the core is $E_2 = 2E_1$. Under the effects of unknown distributed loading, $f_x(x)$ [N/m], the bar is observed to deform. The measured displacement field in the bar is $u_x(x) = ax^2 - 2aLx$, where $a = 0.05$ [1/m] is a dimensional constant and $L = 1$ m is the length of the bar. The origin of the x-axis is at the fixed support, B. The maximum magnitude (absolute value) of stress in the core is found to be 10 MPa.
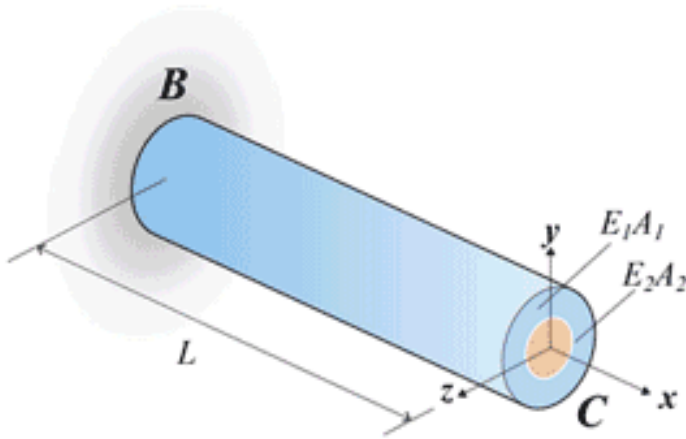
Try it (do not include units in your response):

In terms of L, a, E_1, A_2 and x, write a **symbolic expression** for $N(x)$:

    12*a*L*E_1*A_2*(x/L-1)   ✔

$$12 \cdot a \cdot L \cdot E_1 \cdot A_2 \cdot \left(\frac{x}{L} - 1 \right)$$

What is the **numerical value** of $N(x = 0)$ in Newtons?

    [   ] N ✘

    [Reset]   [Show Answer(s)]

For more information about how learners enter expressions, see Math Response Formatting for Students.

For the math expression input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

For math expression input problems, the grader uses numerical sampling to determine whether a learner's response matches the math expression that you provide, to a specified numerical tolerance. You specify the allowed variables in the expression as well as the range of values for each variable.

When you create a math expression input problem in Studio, you use MathJax to change your plain text into "beautiful math." For more information about how to use MathJax in Studio, see *A Brief Introduction to MathJax in Studio*.

Note: Math expression input problems currently cannot include negative numbers raised to fractional powers, such as (-1)^(1/2). Math expression input problems can include complex numbers raised to fractional powers, or positive non-complex numbers raised to fractional powers.

7.19.1 Create a Math Expression Input Problem

To create a math expression input problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select **Advanced**.

3. Select **Math Expression Input**. Studio adds an example math expression input problem to the unit.

4. Select **Edit**. The Advanced Editor opens.

5. Replace the sample problem XML with your own marked up text. To practice, you can use the example problem that follows.

6. Select **Settings** and provide an identifying **Display Name** for the problem.

7. Define additional settings for the problem. For more information, see *Problem Settings*.

8. Select **Save**.

Example Problem Code

```
<problem>
  <p>Some problems may ask for a mathematical expression. Practice creating mathematical expressions

  <p>Write an expression for the product of R_1, R_2, and the inverse of R_3.</p>
  <formularesponse type="ci" samples="R_1,R_2,R_3@1,2,3:3,4,5#10" answer="$VoVi">
    <responseparam type="tolerance" default="0.00001"/>
    <formulaequationinput size="40" label="Enter the equation"/>
  </formularesponse>

<script type="loncapa/python">
VoVi = "(R_1*R_2)/R_3"
</script>

  <p>Let <i>x</i> be a variable, and let <i>n</i> be an arbitrary constant. What is the derivative o
<script type="loncapa/python">
derivative = "n*x^(n-1)"
</script>
  <formularesponse type="ci" samples="x,n@1,2:3,4#10" answer="$derivative">
    <responseparam type="tolerance" default="0.00001"/>
    <formulaequationinput size="40"  label="Enter the equation"/>
  </formularesponse>

  <solution>
```

```
    <div class="detailed-solution">
      <p>Explanation or Solution Header</p>
      <p>Explanation or solution text</p>
    </div>
  </solution>
</problem>
```

7.19.2 Math Expression Input Problem XML

Templates

```
<problem>
  <p>Write an expression for the product of R_1, R_2, and the inverse of R_3.</p>
  <formularesponse type="ci" samples="R_1,R_2,R_3@1,2,3:3,4,5#10" answer="R_1*R_2/R_3">
    <responseparam type="tolerance" default="0.00001"/>
    <formulaequationinput size="40"  label="Enter the equation" />
  </formularesponse>
</problem>
```

```
<problem>
  <p>Problem text</p>
  <formularesponse type="ci" samples="VARIABLES@LOWER_BOUNDS:UPPER_BOUNDS#NUMBER_OF_SAMPLES" answer='
    <responseparam type="tolerance" default="0.00001"/>
    <formulaequationinput size="20"  label="Enter the equation" />
  </formularesponse>

<script type="loncapa/python">
PYTHON SCRIPT
</script>

  <solution>
    <div class="detailed-solution">
      <p>Explanation or Solution Header</p>
      <p>Explanation or solution text</p>
    </div>
  </solution>
</problem>
```

Tags

- `<formularesponse>`
- `<formulaequationinput />`
- `<responseparam>`
- `<script>`

Tag: `<formularesponse>`

Specifies that the problem is a math expression input problem. The `<formularesponse>` tag is similar to `<numericalresponse>`, but `<formularesponse>` allows unknown variables.

Attributes

`type`: Can be "cs" for case sensitive, which is the default, or "ci" for case insensitive, so that capitalization does not matter in variable names.

`answer`: The correct answer to the problem, given as a mathematical expression. If you precede a variable name in the problem with a dollar sign ($), you can include a script in the problem that computes the expression in terms of that variable.

`samples`: Specifies important information about the problem in the following lists.

- `variables`: A set of variables that learners can enter.

- `lower_bounds`: For every defined variable, a lower bound on the numerical tests to use for that variable.

- `upper_bounds`: For every defined variable, an upper bound on the numerical tests to use for that variable.

- `num_samples`: The number of times to test the expression.

Commas separate items inside each of the four individual lists. The at sign (@), colon (:), and pound sign (#) characters separate the lists. An example of the format follows.

`"variables@lower_bounds:upper_bounds#num_samples"`

For example, a `<formularesponse>` tag that includes the `samples` attribute might look like either of the following.

`<formularesponse samples="x,n@1,2:3,4#10">`

`<formularesponse samples="R_1,R_2,R_3@1,2,3:3,4,5#10">`

Children

`<formulaequationinput />`

Tag: `<formulaequationinput />`

Creates a response field where a learner enters an answer to the problem in plain text, as well as a second field below the response field where the learner sees a typeset version of the plain text. The parser that renders the learner's plain text into typeset math is the same parser that evaluates the learner's response for grading.

Attributes

Attribute	Description
label (required)	Specifies the name of the response field.
size (optional)	Specifies the width, in characters, of the response field where learners enter answers.

Children

(none)

Tag: `<responseparam>`

Used to define an upper bound on the variance of the numerical methods used to approximate a test for equality.

Attributes

Attribute	Description
default (re-quired)	A number or a percentage specifying how close the learner and grader expressions must be. If you do not include a tolerance, the expression is vulnerable to rounding errors during sampling. The result of such unavoidable errors is that the grader can mark some learner input as incorrect, even if it is algebraically equivalent.
type	"tolerance", which defines a tolerance for a number.

Children

(none)

7.20 Molecule Editor Tool
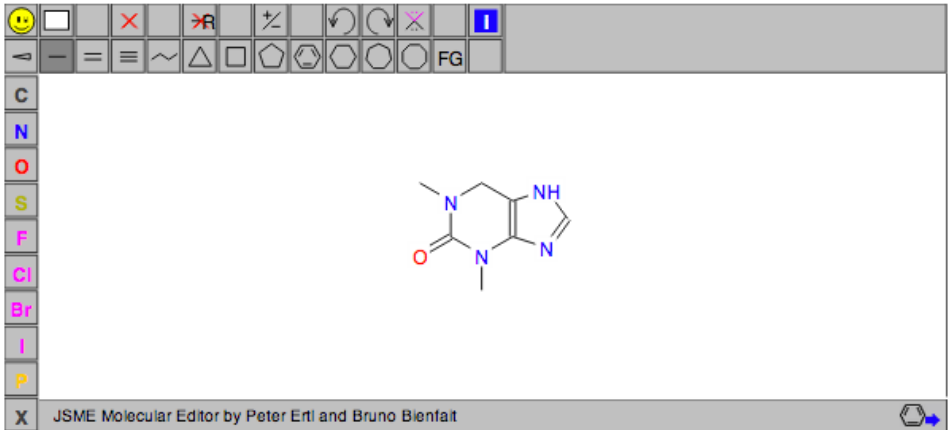
Students can use the molecule editor to learn how to create molecules. The molecule editor allows students to draw molecules that follow the rules for covalent bond formation and formal charge, even if the molecules are chemically impossible, are unstable, or do not exist in living systems. The molecule editor warns students if they try to submit a structure that is chemically impossible.

The molecule editor incorporates two tools: the JSME molecule editor created by Peter Erl and Bruno Bienfait, and JSmol, a JavaScript-based molecular viewer from Jmol. (You don't need to download either of these tools–Studio uses them automatically.) For more information about the JSME molecule editor, see JSME Molecule Editor. For more information about JSmol, see JSmol.

7.20.1 Create the Molecule Editor

To create a molecule editor, you need the following files:

- MoleculeAnswer.png

- MoleculeEditor_HTML.png

- dopamine.mol

To download all of these files in a .zip archive, go to http://files.edx.org/MoleculeEditorFiles.zip.

Note: The molecule that appears when the tool starts is a dopamine molecule. To use a different molecule, download the .mol file for that molecule from the list of molecules on the BioTopics website. Then, upload the .mol file to the **Files & Uploads** page for your course in Studio, and change "dopamine.mol" in the example code to the name of your .mol file.

To create the molecule editor that appears in the image above, you need an HTML component followed by a Problem component.

1. Upload all of the files listed above to the **Files & Uploads** page in your course.

2. Create the HTML component.

1. In the unit where you want to create the problem, click **HTML** under **Add New Component**, and then click **HTML**.

2. In the component that appears, click **Edit**.

3. In the component editor, paste the HTML component code from below.

4. Make any changes that you want, and then click **Save**.

3. Create the Problem component.

1. Under the HTML component, click **Problem** under **Add New Component**, and then click **Blank Advanced Problem**.

2. In the component that appears, click **Edit**.

3. In the component editor, paste the Problem component code from below.

4. Click **Save**.

Molecule Editor Code

To create the molecule editor, you need an HTML component and a Problem component.

HTML Component Code

```
<h2>Molecule Editor</h2>
<p>The molecule editor makes creating and visualizing molecules easy. A chemistry professor may have
<div>
<script type="text/javascript">// <![CDATA[
function toggle2(showHideDiv, switchTextDiv) {
        var ele = document.getElementById(showHideDiv);
        var text = document.getElementById(switchTextDiv);
        if(ele.style.display == "block") {
            ele.style.display = "none";
            text.innerHTML = "+ open";
```

```
              }
          else {
              ele.style.display = "block";
              text.innerHTML = "- close";
          }
      }
// ]]></script>
</div>
<div>
<style type="text/css"></style>
</div>
<div id="headerDiv">
<div id="titleText">Using the Molecule Editor<a id="myHeader" href="javascript:toggle2('myContent','m
</div>
<div id="contentDiv">
<div id="myContent" style="display: none;">
<p>In this problem you will edit a molecule using the molecular drawing program shown below:</p>
<img alt="" src="/static/MoleculeEditor_HTML.png" /></div>
</div>
<p> </p>
<div id="headerDiv">
<div id="titleText">Are the molecules I've drawn chemically possible?<a id="IntroductionHeader" href=
</div>
<div id="contentDiv">
<div id="IntroductionContent" style="display: none;">
<p>The chemical editor you are using ensures that the structures you draw are correct in one very nar
<p>If you submit a structure that includes atoms that are not possible or are beyond the scope of thi
</div>
</div>
<div id="ap_listener_added"> </div>
```

Problem Component Code

```
<problem>
<p>The dopamine molecule, as shown, cannot make ionic bonds. Edit the dopamine molecule so it can mak
<p>When you are ready, click Check. If you need to start over, click Reset.</p>
  <script type="loncapa/python">
def check1(expect, ans):
    import json
    mol_info = json.loads(ans)["info"]
    return any(res == "Can Make Ionic Bonds" for res in mol_info)
    </script>
  <customresponse cfn="check1">
    <editmoleculeinput file="/static/dopamine.mol">
        </editmoleculeinput>
  </customresponse>
  <solution>
    <img src="/static/MoleculeAnswer.png"/>
  </solution>
</problem>
```

Problem 2

```
<problem>
<p>The dopamine molecule, as shown, cannot make strong hydrogen bonds. Edit the dopamine molecule so
<script type="loncapa/python">
def grader_1(expect, ans):
```

```
    import json
    mol_info = json.loads(ans)["info"]
    return any(res == "Cannot Make Strong Hydrogen Bonds" for res in mol_info)
</script>
  <customresponse cfn="grader_1">
    <editamoleculeinput file="/static/dopamine.mol">
    </editamoleculeinput>
  </customresponse>
</problem>
```

Problem 3

```
<problem>
<p>The dopamine molecule has an intermediate hydrophobicity. Edit the dopamine molecule so that it is
<script type="loncapa/python">
def grader_2(expect, ans):
    import json
    mol_info = json.loads(ans)["info"]

    hydrophobicity_index_str=mol_info[0]
    hydrophobicity_index=float(hydrophobicity_index_str[23:])
    return hydrophobicity_index &gt; .490
</script>
  <customresponse cfn="grader_2">
    <editamoleculeinput file="/static/dopamine.mol">
    </editamoleculeinput>
</customresponse>
</problem>
```

7.21 Molecule Viewer Tool

Studio offers two tools that you can use in discussions of molecules:

- With the **molecule viewer** tool, you can create three-dimensional representations of molecules for students to view.

- With the **molecule editor** problem type, you can allow students to draw their own molecules. For more information about this tool, see *Molecule Editor Tool*.

Both tools use **JSmol**, a JavaScript-based molecular viewer from Jmol. (You don't need to download this tool; Studio uses it automatically.) For more information about JSmol, see JSmol.

The following image shows the molecule viewer tool in a course:

CIPROFLOXACIN

In this course, we've studied the chemical structure of several different "broad-spectrum" antibiotics. The following image shows a molecule of Ciprofloxacin, a fluoroquinolone used to treat UTIs:

Note: To create a molecule viewer tool, you must have permission to upload files to a third-party file hosting site such as Amazon Web Services Simple Storage Service (AWS S3). When you create the molecule viewer, you'll upload a folder that contains a large number of files to the file hosting site.

7.21.1 Create the Molecule Viewer Tool

Creating a molecule viewer tool has several steps:

1. Download files from the BioTopics website and from edX.

2. Move or edit some of the files that you downloaded.

3. Upload a folder that contains all of the files that you downloaded and edited to your own file hosting site.

4. Create an HTML component that contains an IFrame in Studio. The IFrame references the files that you upload to the file hosting site.

Download Files from BioTopics and edX

1. Create or download a .mol file for the molecule that you want to show. You can download a variety of .mol files from the BioTopics website. Save the file in a place where you can easily find it.

2. Download the MoleculeViewerFiles.zip file from edX.

3. Unzip the MoleculeViewerFiles.zip file that you've downloaded.

   When you unzip the file, you'll see a **MoleculeViewerFiles** folder that contains the following folders and files:

   - data (folder)

   - j2s (folder)

   - js (folder)

   - MoleculeViewer.html (file)

Move the .mol File and Edit the MoleculeViewer.html File

1. Move the .mol file that you downloaded from BioTopics into the **data** folder that you downloaded from edX.

2. Edit the MoleculeViewer.html file:

   (a) In a text editor, open the MoleculeViewer.html file.

   (b) In line 19 of the MoleculeViewer.html file, change **Example.mol** to the name of your .mol file. For example, if you downloaded the Glucose.mol file, line 19 in your file will look like the following:

   ```
   script:  "set antialiasDisplay; background black; load
   data/Glucose.mol;"
   ```

3. Save the MoleculeViewer.html file.

Upload Files to a Hosting Site

1. Make sure that your **MoleculeViewerFiles** folder contains the following folders and files:

   - data (folder): Earlier, you added a .mol file to this folder.

   - j2s (folder)

   - js (folder)

   - MoleculeViewer.html (file): Earlier, you changed line 19 in this file.

2. Upload the entire **MoleculeViewerFiles** folder to your file hosting site.

Note: Because this folder contains many files, uploading the folder may take several minutes, even over a fast connection.

Create a Component in Studio

1. In Studio, open the unit where you want to add the molecule viewer.

2. Under **Add New Component**, click **HTML**, and then click **IFrame**.

3. In the component editor that opens, replace the existing content with your own text.

4. In the toolbar, click **HTML**.

5. In the **HTML Source Code** box, enter the following line in the place where you want the molecule viewer to appear:

```
<p><iframe name="moleculeiframe" src="https://path_to_folder/MoleculeViewerFiles/Molec
width="500" height="500"></iframe></p>
```

6. Replace `path_to_file` with the URL of your file hosting site. For example, the line may look like the following:

```
<p><iframe name="moleculeiframe" src="https://myfiles.example.com/MoleculeViewerFiles/I
width="500" height="500"></iframe></p>
```

7. Click **OK** to close the **HTML Source Code** box, and then click **Save** to save the component.

8. Click **Preview** to see your component as a student would see it.

7.22 Multiple Choice Problem

Topic Contents

- *Overview*
- *Analyzing Performance on Multiple Choice Problems*
- *Creating a Multiple Choice Problem*
- *Pedagogical Considerations for Multiple Choice Questions*
- *Use Feedback in a Multiple Choice Problem*
- *Use Hints in a Multiple Choice Problem*
- *Multiple Choice Problem XML*
- *Advanced Options for Multiple Choice Problems*

7.22.1 Overview

In multiple choice problems, learners select one option from a list of answer options. Unlike *dropdown* problems, whose answer choices do not appear until the learner clicks the dropdown arrow, answer choices for multiple choice problems are always visible directly below the question.

Multiple choice problems can also have several advanced options, such as presenting a random set of choices to each learner. For more information about these options, see *Advanced Options for Multiple Choice Problems*.

7.22.2 Analyzing Performance on Multiple Choice Problems

For the multiple choice problems in your course, you can use edX Insights to review aggregated learner performance data and examine the submitted answers. For more information, see Using edX Insights.

7.22.3 Creating a Multiple Choice Problem

You can create multiple choice problems in the Simple Editor or in the Advanced Editor. You can set up a problem in the Simple Editor, and then switch to the Advanced Editor to add more configuration options in XML. However, you cannot switch back to the Simple Editor from the Advanced Editor. Therefore, you might want to format the problem as completely as possible before you begin to use the Advanced Editor.

7.22.4 Pedagogical Considerations for Multiple Choice Questions

edX recommends the use, whenever possible, of authentic assessments rather than multiple choice questions for graded problems. Authentic assessments in online courses tend to lead to better learning outcomes. In addition, authentic assessments allow for infinite attempts, mastery learning, and more intellectual risk taking, both of which lead to substantially better learning outcomes.

Multiple choice questions do have several helpful uses:

- **Ungraded multiple choice questions can help students think about a concept** in the context of knowledge transfer.

- **For many subject areas, authentic assessments are either unavailable** or prohibitively complex to use. In such courses, multiple choice questions can act as the only available fallback.

Fortunately, multiple choice questions are among the best studied in assessment literature. A few guidelines for the creation of such questions:

- **Organize the set of answers logically. Use consistent phrasing** between answers, and when possible, parallel structure.

- **Place as many of the words in the stem, and keep the answers** as concise as possible.

- **The distractors should not be substantially shorter, longer,** or use different structure than the answer. The answers should be as consistent in structure, length, and phrasing as possible.

- Avoid negatives (and especially double negatives)

- **Test higher-order thinking (comprehension and critical thinking).** Avoid simple recall.

- **If there is a finite number of attempts, avoid trick questions** and try to keep wording clear and unambiguous.

- Make all distractors plausible.

- **Use "All of the above" and "None of the above" with caution. If a** learner can identify at least two correct answers, it can give away the answer with only partial comprehension.

Use the Simple Editor to Create a Multiple Choice Problem

To use the *Simple Editor* to create a checkbox problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select one of the two multiple choice problem templates.

- From the list of **Common Problem Types**, select **Multiple Choice**.

- From the list of **Common Problems with Hints and Feedback**, select **Multiple Choice with Hints and Feedback**. For more information, see *Use Feedback in a Multiple Choice Problem*.

    Studio adds the problem to the unit.

3. Select **Edit**. The Simple Editor opens.

4. Replace the sample problem text with your own text.

5. Determine the text that describes the question you want learners to answer, and surround that text with two pairs of angle brackets (`>>question<<`). This question text is the accessible label for the problem.

6. Edit your text to place each answer option on a separate line.

7. Select your set of answer options, and then select **Multiple Choice** from the toolbar. A pair of parentheses appears next to each answer choice.

8. To identify the correct answer, add an **x** between the parentheses for that option.

9. To provide an explanation, select the explanation text and then select **Explanation** from the toolbar. [explanation] appears before and after the explanation text.

10. Select **Settings** and provide an identifying **Display Name** for the problem.

11. Define additional settings for the problem. For more information, see *Problem Settings*.

12. Select **Save**.

For the example problem illustrated above, the following text is displayed in the problem component.

```
>>Lateral inhibition, as was first discovered in the horsehoe crab:<<

( ) is a property of touch sensation, referring to the ability of crabs
to detect nearby predators.
( ) is a property of hearing, referring to the ability of crabs to detect
low frequency noises.
(x) is a property of vision, referring to the ability of crabs' eyes to
enhance contrasts.
( ) has to do with the ability of crabs to use sonar to detect fellow
horseshoe crabs nearby.
( ) has to do with a weighting system in the crab's skeleton that allows
it to balance in turbulent water.

[Explanation]
Horseshoe crabs were essential to the discovery of lateral
inhibition, a property of vision present in horseshoe crabs as well as in
humans that enables enhancement of contrast at edges of objects as was
demonstrated in class. In 1967, Haldan Hartline received the Nobel prize
for his research on vision and in particular his research investigating
lateral inhibition using horseshoe crabs.
[Explanation]
```

Use the Advanced Editor to Edit a Multiple Choice Problem

To use the *Advanced Editor* to edit a multiple choice problem, follow these steps.

1. Follow the steps for creating the problem in the *Simple Editor*.

2. Select **Advanced Editor**, and then edit the XML to add the tags and attributes you want. An example follows.

```xml
<problem>
<p>Lateral inhibition, as was first discovered in the horseshoe crab...</p>
<multiplechoiceresponse>
  <choicegroup type="MultipleChoice" label="Lateral inhibition, as was first discovered
    in the horseshoe crab">
    <choice correct="false">is a property of touch sensation, referring to the ability
    of crabs to detect nearby predators.</choice>
    <choice correct="false">is a property of hearing, referring to the ability of crabs
    to detect low frequency noises.</choice>
    <choice correct="false">is a property of vision, referring to the ability of crabs'
    eyes to enhance contrasts.</choice>
    <choice correct="true">has to do with the ability of crabs to use sonar to detect
    fellow horseshoe crabs nearby.</choice>
    <choice correct="false">has to do with a weighting system in the crab's skeleton
    that allows it to balance in turbulent water.</choice>
  </choicegroup>
</multiplechoiceresponse>
```

```
<solution>
  <div class="detailed-solution">
    <p>Explanation</p>
    <p>Horseshoe crabs were essential to the discovery of lateral inhibition,
     a property of vision present in horseshoe crabs as well as humans that
     enables enhancement of contrast at edges of objects as was demonstrated in class.
     In 1967, Haldan Hartline received the Nobel prize for his research on vision
     and in particular his research investigating lateral inhibition using
     horseshoe crabs.</p>
  </div>
</solution>
</problem>
```

7.22.5 Use Feedback in a Multiple Choice Problem

You can add feedback in a multiple choice problem using the simple editor or the advanced editor. For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*.

In multiple choice problems, you can provide feedback for each option that a learner can select. Use the following guidelines when providing feedback.

- Use feedback for the incorrect answers to target common misperceptions and mistakes.

- Ensure feedback provides some guidance to the learner about how to arrive at the correct answer.

- Use feedback for the correct answer as an opportunity to reinforce why the answer is correct. Because learners are able to guess, ensure that feedback provides a reason why the answer is correct for learners who might have selected that answer by chance.

Configure Feedback in the Simple Editor

In the *Simple Editor*, you configure answer feedback with the following syntax. When you create a new multiple choice problem, select the template **Multiple Choice with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
( ) Answer {{Feedback for learners who select this answer.}}
```

For example, the following problem has feedback for each possible answer.

```
>>Which of the following is an example of a vegetable?<<
( ) apple {{An apple is the fertilized ovary that comes from an apple tree
and contains seeds classifying it as a fruit.}}
( ) pumpkin {{A pumpkin is the fertilized ovary of a squash plant and
contains seeds classifying it as a fruit.}}
(x) potato {{A potato is an edible part of a plant in tuber form and is
classified as a vegetable}}
( ) tomato {{Many people mistakenly think a tomato is a vegetable. However,
because a tomato is the fertilized ovary of a tomato plant and contains
seeds it is classified as a fruit.}}
```

Configure Feedback in the Advanced Editor

In the *Advanced Editor*, you configure answer feedback with the following syntax.

```
<choice correct="false">
  Choice Label
  <choicehint>
    Feedback for when learner selects this answer.
  </choicehint>
</choice>
```

For example, the following problem has feedback for each answer.

```
<multiplechoiceresponse>
  <choicegroup label="Which of the following is an example of a vegetable?"
    type="MultipleChoice">
    <choice correct="false">apple
      <choicehint>An apple is the fertilized
        ovary that comes from an apple tree and contains seeds classifying
        it as a fruit.
      </choicehint>
    </choice>
    <choice correct="false">pumpkin
      <choicehint>A pumpkin is the fertilized
        ovary of a squash plant and contains seeds classifying it as a fruit.
      </choicehint>
    </choice>
    <choice correct="true">potato
      <choicehint>A potato is an edible part of a plant in tuber form and is
        classified as a vegetable.
      </choicehint>
    </choice>
    <choice correct="false">tomato
      <choicehint>Many people mistakenly think a tomato is a vegetable.
       However, because a tomato is the fertilized ovary of a tomato plant
       and contains seeds it is classified as a fruit.
      </choicehint>
    </choice>
  </choicegroup>
</multiplechoiceresponse>
```

Customize Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

MULTIPLE CHOICE WITH HINTS AND FEEDBACK (1 point possible)

You can provide feedback for each option in a multiple choice problem.

You can also add hints for learners.

Be sure to select Settings to specify a Display Name and other values that apply.

Use the following example problem as a model.

Which of the following is a vegetable?

- ○ apple
- ◉ pumpkin ✖
- ○ potato
- ○ tomato

Incorrect: A pumpkin is the fertilized ovary of a squash plant and contains seeds, meaning it is a fruit.

Check   **Hint**

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

Note: The default labels **Correct** and **Incorrect** are displayed in the learner's requested language. If you provide custom labels, they are displayed to all users as you configure them and are not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *Simple Editor*, you configure custom feedback labels with the following syntax.

```
( ) Answer {{Label:: Feedback for learners who select this answer.}}
```

For example, the following feedback is configured to use a custom label.

```
( ) tomato {{Not Quite:: Many people mistakenly think a tomato is a
vegetable. However, because a tomato is the fertilized ovary of a tomato
plant and contains seeds, it is a fruit.}}
```

Customize Feedback Labels in the Advanced Editor

In the *Advanced Editor*, you configure custom feedback labels with the following syntax.

```
<choice correct="true or fale">Answer
  <choicehint label="Custom Label">
    Feedback for learners who select this answer.
  </choicehint>
</choice>
```

For example, the following feedback is configured to use a custom label.

```
<choice correct="false">
  tomato
  <choicehint label="Not Quite">
    Many people mistakenly think a tomato is a vegetable. However, because
    a tomato is the fertilized ovary of a tomato plant and contains seeds,
    it is a fruit.
  </choicehint>
</choice>
```

7.22.6 Use Hints in a Multiple Choice Problem

You can add hints in a multiple choice problem, using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you configure each hint in the `<hint>` element within the `<demandhint>` element.

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
```

For example, the following XML shows two hints.

```
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
```

7.22.7 Multiple Choice Problem XML

Template

```xml
<problem>
<p>Question text</p>
<multiplechoiceresponse>
  <choicegroup type="MultipleChoice" label="label text">
    <choice correct="false" name="a">
      Incorrect choice
      <choicehint>
        Hint for incorrect choice.
      </choicehint>
    </choice>
    <choice correct="true" name="b">
      Correct choice
      <choicehint>
        Hint for correct choice.
      </choicehint>
    </choice>
  </choicegroup>
</multiplechoiceresponse>
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
</demandhint>

<solution>
  <div class="detailed-solution">
  <p>Explanation or solution header</p>
  <p>Explanation or solution text</p>
  </div>
</solution>
</problem>
```

Tags

- `<multiplechoiceresponse>` (required): Indicates that the problem is a multiple choice problem.

- `<choicegroup>` (required): Indicates the beginning of the list of options.

- `<choice>` (required): Lists an answer option.

- `<demandhint>` (optional): Specifies hints for the learner.

Tag: `<multiplechoiceresponse>`

Indicates that the problem is a multiple choice problem.

> Attributes
>
> (none)
>
> Children
>
> - `<choicegroup>`
>
> - All standard HTML tags (can be used to format text).

Tag: `<choicegroup>`

Indicates the beginning of the list of options.

Attributes

Attribute	Description
label (required)	Specifies the name of the response field.
type (required)	Must be set to "MultipleChoice".

Children

- `<choice>`

Tag: `<choice>`

Lists an answer option.

Attributes

Attribute	Description
correct (at least one required)	Indicates a correct or incorrect answer. When the attribute is set to "true", the choice is a correct answer. When the attribute is set to "false", the choice is an incorrect answer. You can specify more than one correct answer, but learners can select only once choice to submit as their answer.
name	A unique name that the back end uses to refer to the choice.

Children

`<choicehint>`

Tag: `<choicehint>`

Specifies a hint for the answer.

Tag: `<demandhint>`

Specifies hints available to the learner.

Children

`<hint>`

Tag: `<hint>`

Specifies a hint available to the learner.

Children

(none)

7.22.8 Advanced Options for Multiple Choice Problems

Multiple choice problems have several advanced options. You can change the order of answers in the problem, include explanations that appear when a learner selects a specific incorrect answer, or present a random set of choices to each learner. For more information, see the following sections.

- *Shuffle Answers in a Multiple Choice Problem*
- *Targeted Feedback in a Multiple Choice Problem*
- *Answer Pools in a Multiple Choice Problem*

Shuffle Answers in a Multiple Choice Problem

Optionally, you can configure a multiple choice problem so that it shuffles the order of possible answers.

For example, one view of a geography problem could be as follows.

```
What Apple device competed with the portable CD player?

( ) The iPad
( ) Napster
( ) The iPod
( ) The vegetable peeler
```

Another view of the same problem, for a different learner or for the same learner on a subsequent view of the unit, could be as follows.

```
What Apple device competed with the portable CD player?

( ) The iPad
( ) The iPod
( ) The vegetable peeler
( ) Napster
```

You can also have some answers shuffled, but not others. For example, you might want to include the answer "All of the Above" and have it always appear at the end of the list, but shuffle the other answers.

You can configure the problem to shuffle answers using the Simple Editor or Advanced Editor.

Use the Simple Editor to Shuffle Answers

You can configure the problem to shuffle answers in *The Simple Editor*.

For example, the following text defines a multiple choice problem before shuffling is enabled. The `(x)` indicates the correct answer.

```
>>What Apple device competed with the portable CD player?<<
    ( ) The iPad
    ( ) Napster
    (x) The iPod
    ( ) The vegetable peeler
```

To add shuffling to this problem, add `!` between the parentheses of the first answer.

```
>>What Apple device competed with the portable CD player?<<
    (!) The iPad
    ( ) Napster
    (x) The iPod
    ( ) The vegetable peeler
```

To fix an answer's location in a shuffled list, add `@` between the parentheses of that answer.

```
>>What Apple device competed with the portable CD player?<<
    (!) The iPad
    ( ) Napster
    (x) The iPod
    ( ) The vegetable peeler
    (@) All of the above
```

You can combine symbols within the parentheses as necessary. For example, to show the correct answer in a fixed location, you can use both `x` and `@`.

```
(x@) The iPod
```

Use the Advanced Editor to Shuffle Answers

You can configure the problem to shuffle answers by editing XML in the *The Advanced Editor*.

For example, the following XML defines a multiple choice problem before shuffling is enabled.

```xml
<problem>
 <p>What Apple device competed with the portable CD player?</p>
 <multiplechoiceresponse>
  <choicegroup type="MultipleChoice">
    <choice correct="false">The iPad</choice>
    <choice correct="false">Napster</choice>
    <choice correct="true">The iPod</choice>
    <choice correct="false">The vegetable peeler</choice>
  </choicegroup>
 </multiplechoiceresponse>
</problem>
```

To add shuffling to this problem, add `shuffle="true"` to the `<choicegroup>` element.

```xml
<problem>
 <p>What Apple device competed with the portable CD player?</p>
 <multiplechoiceresponse>
  <choicegroup type="MultipleChoice" shuffle="true">
    <choice correct="false">The iPad</choice>
    <choice correct="false">Napster</choice>
    <choice correct="true">The iPod</choice>
    <choice correct="false">The vegetable peeler</choice>
  </choicegroup>
 </multiplechoiceresponse>
</problem>
```

To fix an answer's location in the list, add `fixed="true"` to the `choice` element for the answer.

```xml
<problem>
 <p>What Apple device competed with the portable CD player?</p>
 <multiplechoiceresponse>
  <choicegroup type="MultipleChoice" shuffle="true">
    <choice correct="false">The iPad</choice>
    <choice correct="false">Napster</choice>
    <choice correct="true">The iPod</choice>
    <choice correct="false">The vegetable peeler</choice>
    <choice correct="false" fixed="true">All of the above</choice>
  </choicegroup>
 </multiplechoiceresponse>
</problem>
```

Targeted Feedback in a Multiple Choice Problem

You can configure a multiple choice problem so that explanations for incorrect answers are automatically shown to learners. You can use these explanations to guide learners towards the right answer. Therefore, targeted feedback is most useful for multiple choice problems for which learners are allowed multiple attempts.

Use the Advanced Editor to Configure Targeted Feedback

You configure the problem to provide targeted feedback by editing XML in the *The Advanced Editor*.

Follow these XML guidelines.

- Add a `targeted-feedback` attribute to the `<multiplechoiceresponse>` element, with no value:
  `<multiplechoiceresponse targeted-feedback="">`.

- Add a `<targetedfeedbackset>` element before the `<solution>` element.

- Within `<targetedfeedbackset>`, add one or more `<targetedfeedback>` elements.

- Within each `<targetedfeedback>` element, enter your explanation for the incorrect answer in HTML as markup described below.

- Connect the `<targetedfeedback>` element with a specific incorrect answer by using the same `explanation-id` attribute value for each.

- Use the `<solution>` element for the correct answer, with the same `explanation-id` attribute value as the correct `<choice>` element.

For example, the XML for the multiple choice problem follows.

```
<problem>
<p>What Apple device competed with the portable CD player?</p>
<multiplechoiceresponse targeted-feedback="">
 <choicegroup type="MultipleChoice">
   <choice correct="false" explanation-id="feedback1">The iPad</choice>
   <choice correct="false" explanation-id="feedback2">Napster</choice>
   <choice correct="true" explanation-id="correct">The iPod</choice>
   <choice correct="false" explanation-id="feedback3">The vegetable peeler</choice>
 </choicegroup>
</multiplechoiceresponse>
...
```

This is followed by XML that defines the targeted feedback.

```
...
<targetedfeedbackset>
  <targetedfeedback explanation-id="feedback1">
    <div class="detailed-targeted-feedback">
      <p>Targeted Feedback</p>
      <p>The iPad came out later and did not directly compete with portable
        CD players.</p>
    </div>
  </targetedfeedback>
  <targetedfeedback explanation-id="feedback2">
    <div class="detailed-targeted-feedback">
      <p>Targeted Feedback</p>
      <p>Napster was not an Apple product.</p>
    </div>
  </targetedfeedback>
  <targetedfeedback explanation-id="feedback3">
    <div class="detailed-targeted-feedback">
      <p>Targeted Feedback</p>
      <p>Vegetable peelers do not play music.</p>
    </div>
  </targetedfeedback>
 </targetedfeedbackset>

 <solution explanation-id="correct">
```

```
 <div class="detailed-solution">
  <p>The iPod directly competed with portable CD players.</p>
 </div>
</solution>
</problem>
```

Answer Pools in a Multiple Choice Problem

You can configure a multiple choice problem so that a random subset of choices are shown to each learner. For example, you can add 10 possible choices to the problem, and each learner views a set of five choices.

The answer pool must have at least one correct answer. It can have more than one correct answer. In each set of choices shown to a learner, one correct answer is included. For example, you can configure two correct answers in the set of choices. One of the two correct answers is included in each set that a learner views.

Use the Advanced Editor to Configure Answer Pools

You configure the problem to provide answer pools by editing XML in the *The Advanced Editor*.

Follow these XML guidelines:

- In the `<choicegroup>` element, add the `answer-pool` attribute, with the numerical value indicating the number of possible answers in the set. For example, `<choicegroup answer-pool="4">`.

- For each correct answer, to the `<choice>` element, add an `explanation- id` attribute and value that maps to a solution. For example, `<choice correct="true" explanation-id="iPod">The iPod</choice>`.

- For each `<solution>` element, add an `explanation-id` attribute and value that maps back to a correct answer. For example, `<solution explanation-id="iPod">`.

Note: If the choices include only one correct answer, you do not have to use the `explanation-id` in either the `choice` or `<solution>` element. You do still use the `<solutionset>` element to wrap the `<solution>` element.

For example, for the following multiple choice problem, a learner will see four choices. In each set, one of the choices will be one of the two correct choices. The explanation shown for the correct answer is the one with the same explanation ID.
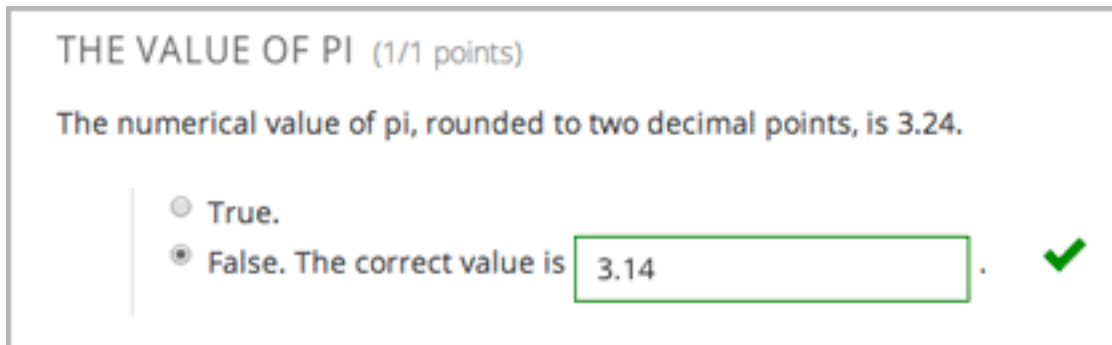
```
<problem>
 <p>What Apple devices let you carry your digital music library in your pocket?</p>
  <multiplechoiceresponse>
   <choicegroup type="MultipleChoice" answer-pool="4">
     <choice correct="false">The iPad</choice>
     <choice correct="false">Napster</choice>
     <choice correct="true" explanation-id="iPod">The iPod</choice>
     <choice correct="false">The vegetable peeler</choice>
     <choice correct="false">The iMac</choice>
     <choice correct="true" explanation-id="iPhone">The iPhone</choice>
   </choicegroup>
  </multiplechoiceresponse>

  <solutionset>
      <solution explanation-id="iPod">
      <div class="detailed-solution">
          <p>Explanation</p>
```

```
            <p>Yes, the iPod is Apple's portable digital music player.</p>
        </div>
        </solution>
        <solution explanation-id="iPhone">
        <div class="detailed-solution">
            <p>Explanation</p>
            <p>In addition to being a cell phone, the iPhone can store and play your
                digital music.</p>
        </div>
        </solution>
    </solutionset>
</problem>
```

7.23 Multiple Choice and Numerical Input Problem

You can create a problem that combines a multiple choice and numerical input problems. Students not only select a response from options that you provide, but also provide more specific information, if necessary.

Note: Currently, students can only enter numerals in the text field. Students cannot enter words or mathematical expressions, which might be confusing to students used to normal edX numerical inputs.

7.23.1 Create a Multiple Choice and Numerical Input Problem

To create a multiple choice and numerical input problem:

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Blank Advanced Problem**.

3. In the component that appears, click **Edit**.

4. In the component editor, paste the code from below.

5. Replace the example problem and response options with your own text.

6. Click **Save**.

7.23.2 Multiple Choice and Numerical Input Problem Code

```
<problem>
The numerical value of pi, rounded to two decimal points, is 3.24.
<choicetextresponse>
<radiotextgroup>
<choice correct="false">True.</choice>
<choice correct="true">False. The correct value is <numtolerance_input answer="3.14"/>.</choice>
</radiotextgroup>
</choicetextresponse>
</problem>
```

7.24 Notes Tool

The Notes tool allows learners to highlight and make notes about what they read in the courseware.

Note: The Notes tool is available for text, including text in HTML components. However, the tool is currently not available for discussions, exercises, video transcripts, or PDF documents.

This tool is enabled by default. You do not have to do anything before learners can use this tool.

Learners can access their notes either in the body of the course or on a **Notes** page. On the **Notes** page, a learner can see all the notes that she has made during the course. The page also contains links to the location of the notes in the courseware.

For detailed information about the ways learners can use notes, see Notes.

7.25 Numerical Input Problem

Topic Contents

- *Overview*
- *Analyzing Performance on Numerical Input Problems*
- *Creating a Numerical Input Problem*
- *Use Feedback in a Numerical Input Problems*
- *Use Hints in a Numerical Input Problem*
- *Numerical Input Problem XML*

7.25.1 Overview

In numerical input problems, learners enter numbers or specific and relatively simple mathematical expressions to answer a question. The text that the learners enter is converted to a symbolic expression that appears below the response field.

NUMERICAL INPUT (1/2 points)

How many miles away from Earth is the sun? Use scientific notation to answer.

9.3*10^6 ✖

$9.3 \cdot 10^6$

Answer: 9.3*10^7

The square of what number is -100?

10*i ✔

$10 \cdot i$

Answer: 10*i

EXPLANATION

The sun is 93,000,000, or 9.3*10^7, miles away from Earth.

-100 is the square of 10 times the imaginary number, i.

CHECK   HIDE ANSWER

Responses for numerical input problems can include integers, fractions, and constants such as pi and g. Responses can also include text representing common functions, such as square root (sqrt) and log base 2 (log2), as well as trigonometric functions and their inverses, such as sine (sin) and arcsine (arcsin). For these functions, learners enter text that is converted into mathematical symbols. The following example shows a response entered by a learner and the numerical expression that results.

n*x^(n-1)

$n \cdot x^{n-1}$

For more information about how learners enter expressions, see Math Response Formatting for Students.

You can specify a margin of error, or tolerance, for the answers to these problems so that learners' responses do not have to be exact. You can specify a correct answer explicitly or use a Python script.

7.25.2 Analyzing Performance on Numerical Input Problems

For the numerical input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

7.25.3 Creating a Numerical Input Problem

You can create numerical problems in the Simple Editor or in the Advanced Editor.

- If the text of your problem does not include any italics, bold formatting, or special characters, you can create the problem in the Simple Editor.

- If the text of your problem contains special formatting or characters, or if your problem contains a Python script, you use the Advanced Editor.

For example, you must use the Advanced Editor to define the following problems.

In this example, the question uses a Python script to compute the square root.

For more information about including a Python script in your problem, see *Write-Your-Own-Grader Problem*.

Use the Simple Editor to Create a Numerical Input Problem

To the *Simple Editor* to create a numerical input problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select one of the two numerical input problem templates.

- From the list of **Common Problem Types**, select **Numerical Input**.

- From the list of **Common Problems with Hints and Feedback**, select **Numerical Input with Hints and Feedback**. For more information, see *Use Feedback in a Numerical Input Problems*.

   Studio adds the problem to the unit.

3. Select **Edit**. The Simple Editor opens.

4. Replace the sample problem text with your own text.

5. Determine the text that describes the question you want learners to answer, and surround that text with two pairs of angle brackets (>>question<<). This question text is the accessible label for the problem. question text is the accessible label for the problem.

---

6. To identify the problem's answer, select the answer text and then select **Numerical Input** from the toolbar. An equals sign appears next to the answer.

7. Optionally, specify a margin of error, or tolerance. You can specify a percentage, number, or range.

   - To specify a percentage on either side of the correct answer, after the answer add **+-{number}%**. For example, to include a 2% tolerance, add **+-2%**.

   - To specify a number on either side of the correct answer, after the answer add **+-{number}**. For example, to include a tolerance of 5, add **+-5**.

   - To specify a range, you provide the starting and ending values separated by a comma and then surround the range with brackets [] or parentheses (). A bracket includes the number next to it in the range, and a parenthesis excludes the number from the range. For example, if you specify **[5, 8)**, correct answers can be 5, 6, and 7, but not 8. Likewise, if you specify **(5, 8]**, correct answers can be 6, 7, and 8, but not 5.

8. To provide an explanation, select the explanation text and then select **Explanation** from the toolbar. [explanation] appears before and after the explanation text.

9. Select **Settings** and provide an identifying **Display Name** for the problem.

10. Define additional settings for the problem. For more information, see *Problem Settings*.

11. Select **Save**.

For the first example problem illustrated above, the text in the problem component appears as follows.

```
>>What base is the decimal numeral system in?<<

= 10

[explanation]
The decimal numeral system is base ten.
[explanation]
```

Use the Advanced Editor to Create a Numerical Input Problem

For a more complex problem, such as the one that follows, you use the Advanced Editor.

1. Follow the steps for creating the problem in the *Simple Editor*.

2. Select **Advanced Editor**, and then edit the XML to add the tags and attributes you want. An example follows.

Problem Code:

```xml
<problem>
  <p><b>Example Problem</b></p>

<legend>What base is the decimal numeral system in?</legend>
    <numericalresponse answer="10">
        <formulaequationinput label="What base is the decimal numeral system in?"/>
    </numericalresponse>
</p>

  <legend>What is the value of the standard gravity constant <i>g</i>, measured in m/s<sup>2</sup>? (
  <numericalresponse answer="9.80665">
    <responseparam type="tolerance" default="0.01" />
    <formulaequationinput label="Give your answer to at least two decimal places"/>
  </numericalresponse>

<!-- The following lines use Python script spacing. Make sure it is not indented when you add it to
```

```
<script type="loncapa/python">
computed_response = math.sqrt(math.fsum([math.pow(math.pi,2), math.pow(math.e,2)]))
</script>

<legend>What is the distance in the plane between the points (pi, 0) and (0, e)? You can type math.</
    <numericalresponse answer="$computed_response">
        <responseparam type="tolerance" default="0.0001" />
        <formulaequationinput label="What is the distance in the plane between the points (pi, 0) and
    </numericalresponse>
<solution>
  <div class="detailed-solution">
    <p>Explanation</p>
    <p>The decimal numerical system is base ten.</p>
    <p>The standard gravity constant is defined to be precisely 9.80665 m/s<sup>2</sup>.
    This is 9.80 to two decimal places. Entering 9.8 also works.</p>
    <p>By the distance formula, the distance between two points in the plane is
      the square root of the sum of the squares of the differences of each coordinate.
     Even though an exact numerical value is checked in this case, the
     easiest way to enter this answer is to type
     <code>sqrt(pi^2+e^2)</code> into the editor.
     Other answers like <code>sqrt((pi-0)^2+(0-e)^2)</code> also work.
    </p>
  </div>
</solution>
</problem>
```

7.25.4 Use Feedback in a Numerical Input Problems

You can add feedback in a numerical input problem using the simple editor or the advanced editor. For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*.

In numerical input problems, you can provide feedback for correct answers.

Note: You cannot provide feedback for incorrect answers in numerical input problems.

Use feedback for the correct answer to reinforce the process for arriving at the numerical value.

Configure Feedback in the Simple Editor

In the *Simple Editor*, you configure answer feedback with the following syntax. When you create a new numerical input problem, select the template **Numerical Input with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
= Numerical Answer {{Feedback for the correct answer.}}
```

For example, the following problem has feedback for each possible answer.

```
>>What is the arithmetic mean for the following set of numbers?
  (1, 5, 6, 3, 5)<<

= 4 {{The mean for this set of numbers is 20 / 5 which equals 4.}}
```

Configure Feedback in the Advanced Editor

In the *Advanced Editor*, you configure answer feedback with the following syntax.

```
<numericalresponse answer="Correct Answer">
  <formulaequationinput label="Question" />
  <correcthint>
    Feedback for the correct answer.
  </correcthint>
</numericalresponse>
```

For example, the following problem has feedback for the correct answer.

```
<numericalresponse answer="4">
  <formulaequationinput label="What is the arithmetic mean for the following
    set of numbers? (1, 5, 6, 3, 5)" />
  <correcthint>
    The mean for this set of numbers is 20 / 5 which equals 4.
  </correcthint>
</numericalresponse>
```

Customize Feedback Labels

By default, the feedback label for correct answers is **Correct** . If you do not define a feedback label, learners see this term when they submit a correct answer, as in the following example.

NUMERICAL INPUT WITH HINTS AND FEEDBACK (1/1 point)

What is the arithmetic mean for the following set of numbers? (1, 5, 6, 3, 5)

4 ✔

4

Correct: The mean for this set of numbers is 20 / 5 which equals 4.

Check   Hint   Show Answer

You can configure the problem to override the default labels. For example, you can configure a custom label for the answer.

Note: The default label **Correct** is displayed in the learner's requested language. If you provide a custom label, it is displayed to all users as you configure it and is not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *Simple Editor*, you configure a custom feedback label with the following syntax.

```
= 4 {{Label::Feedback}}
```

For example, the following feedback is configured to use a custom label.

```
= 4 {{Good Job::The mean for this set of numbers is 20 / 5 which equals 4.}}
```

Customize Feedback Labels in the Advanced Editor

In the *Advanced Editor*, you configure custom feedback labels with the following syntax.

```
<correcthint label="Custom Label">
  Feedback
</correcthint>
```

For example, the following feedback is configured to use a custom label.

```
<correcthint label="Good Job">
  The mean for this set of numbers is 20 / 5 which equals 4.
</correcthint>
```

7.25.5 Use Hints in a Numerical Input Problem

You can use hints in a numerical input problem, using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you configure each hint in the `<hint>` element within the `<demandhint>` element.

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
```

For example, the following XML shows two hints.

```
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
```

7.25.6 Numerical Input Problem XML

Templates

The following templates represent problems with and without a decimal or percentage tolerance.

Problem with No Tolerance

```
<problem>

  <legend>TEXT OF PROBLEM</legend>
  <numericalresponse answer="ANSWER (NUMBER)">
    <formulaequationinput label="TEXT OF PROBLEM"/>
    <correcthint>
      Feedback for the correct answer.
    </correcthint>
  </numericalresponse>
  <solution>
    <div class="detailed-solution">
      <p>TEXT OF SOLUTION</p>
```

```
    </div>
  </solution>
</problem>
```

Problem with a Decimal Tolerance

```
<problem>

  <legend>TEXT OF PROBLEM</legend>
  <numericalresponse answer="ANSWER (NUMBER)">
    <responseparam type="tolerance" default="NUMBER (DECIMAL, e.g., .02)" />
    <formulaequationinput label="TEXT OF PROBLEM"/>
    <correcthint>
      Feedback for the correct answer.
    </correcthint>
  </numericalresponse>

  <solution>
    <div class="detailed-solution">
      <p>TEXT OF SOLUTION</p>
    </div>
  </solution>
</problem>
```

Problem with a Percentage Tolerance

```
<problem>

  <legend>TEXT OF PROBLEM</legend>
  <numericalresponse answer="ANSWER (NUMBER)">
    <responseparam type="tolerance" default="NUMBER (PERCENTAGE, e.g., 3%)" />
    <formulaequationinput label="TEXT OF PROBLEM"/>
    <correcthint>
      Feedback for the correct answer.
    </correcthint>
  </numericalresponse>

  <solution>
    <div class="detailed-solution">
      <p>TEXT OF SOLUTION</p>
    </div>
  </solution>
  </problem>
```

Answer Created Using a Script

```
<problem>

<!-- The following lines use Python script spacing. Make sure it is not indented when you add it to y
<script type="loncapa/python">
computed_response = math.sqrt(math.fsum([math.pow(math.pi,2), math.pow(math.e,2)]))
</script>
```

```
<legend>TEXT OF PROBLEM</legend>
<numericalresponse answer="$computed_response">
  <responseparam type="tolerance" default="0.0001" />
  <formulaequationinput label="TEXT OF PROBLEM"/>
  <correcthint>
    Feedback for the correct answer.
  </correcthint>
</numericalresponse>

<solution>
  <div class="detailed-solution">
    <p>TEXT OF SOLUTION</p>
  </div>
</solution>
</problem>
```

Tags

- `<numericalresponse>` (required): Specifies that the problem is a numerical input problem.

- `<formulaequationinput />` (required): Provides a response field where the learner enters a response.

- `<correcthint>` (optional): Specifies feedback for the correct answer.

- `<responseparam>` (optional): Specifies a tolerance, or margin of error, for an answer.

- `<script>` (optional)

Note: Some older problems use the `<textline math="1" />` tag instead of the `<formulaequationinput />` tag. However, the `<textline math="1" />` tag has been deprecated. All new problems should use the `<formulaequationinput />` tag.

Tag: `<numericalresponse>`

Specifies that the problem is a numerical input problem. The `<numericalresponse>` tag is similar to the `<formularesponse>` tag, but the `<numericalresponse>` tag does not allow unspecified variables.

Attributes

Attribute	Description
answer (required)	The correct answer to the problem, given as a mathematical expression.

Note: If you include a variable name preceded with a dollar sign ($) in the problem, you can include a script in the problem that computes the expression in terms of that variable.

The grader evaluates the answer that you provide and the learner's response in the same way. The grader also automatically simplifies any numeric expressions that you or a learner provides. Answers can include simple expressions such as "0.3" and "42", or more complex expressions such as "1/3" and "sin(pi/5)".

Children

- `<responseparam>`

- `<formulaequationinput>`

- `<correcthint>`

Tag: `<formulaequationinput>`

Creates a response field in the LMS where learners enter a response.

Attributes

Attribute	Description
label (required)	Specifies the name of the response field.
size (optional)	Defines the width, in characters, of the response field in the LMS.

Children

(none)

Tag: `<responseparam>`

Specifies a tolerance, or margin of error, for an answer.

Attributes

Attribute	Description
type (optional)	"tolerance": Defines a tolerance for a number.
default (optional)	A number or a percentage specifying a numerical or percent tolerance.

Children

(none)

Tag: `<correcthint>`

Specifies a hint for the correct answer.

Tag: `<script>`

Specifies a script that the grader uses to evaluate a learner's response. A problem behaves as if all of the code in all of the script tags were in a single script tag. Specifically, any variables that are used in multiple `<script>` tags share a namespace and can be overridden.

As with all Python, indentation matters, even though the code is embedded in XML.

Attributes

Attribute	Description
type (required)	Must be set to "loncapa/python".

Children

(none)

Tag: `<demandhint>`

Specifies hints available to the learner.

Children

`<hint>`

Tag: `<hint>`

Specifies a hint available to the learner.

Children

(none)

7.26 Open Response Assessments

7.26.1 Open Response Assessments

The topics in this section provide an overview and details about open response assessments.

- *Introduction to Open Response Assessments*
- *Best Practices for Open Response Assessments*
- *Elements of an Open Response Assessment*
- *How Open Response Assessments Are Scored*
- *Top Responses*

Introduction to Open Response Assessments

Open response assessments allow the course team to assign questions that might not have definite answers, such as text responses or short essays. Learners submit responses to questions, then each learner and the learner's peers compare the responses to a rubric that you create. You can also allow learners to upload an image to accompany a text response.

Open response assessments can include both peer assessments and self assessments. In peer assessments, learners compare their peers' responses to a rubric that you create. In self assessments, learners compare their own responses to the rubric.

In open response assessments, learners usually only see their own responses and any peer responses they assess. You can also allow learners to see the top scoring responses that their peers have submitted. For more information, see *Top Responses*.

Note: Open response assessments that are visible to all learners do not respect cohorts. In other words, it is possible for learners in one cohort to be asked to grade responses for learners in another cohort. If you want to make an open response assessment divided by cohort, you must create that assessment in a course component that is defined as cohort-specific. For more information about cohorts and creating cohort-specific courseware, see *Using Cohorts in Your Courses* and *Creating Cohort-Specific Courseware*.

For more information about creating open response assessments, including step by step instructions, see the following sections.

- *Best Practices for Open Response Assessments*

- *Elements of an Open Response Assessment*

- *How Open Response Assessments Are Scored*

- *Create an Open Response Assessment Assignment*

- *Accessing Assignment and Learner Metrics*

For information about viewing metrics and learner responses for released open response assessments, see *Accessing Assignment and Learner Metrics*.

For information about the learner experience with open response assessments, see Open Response Assessments in the edX Guide for Learners.

Best Practices for Open Response Assessments

Open response assessments can be a powerful teaching tool, but they are more effective in some situations than in others. In general, open response assessments are best suited to open-ended or project-based assignments with subjective essay answers and discussion. For example, open response assessments work well in humanities assignments where learners are encouraged to make subjective assessments of text or images, but they might not be the ideal tool in chemistry assignments where there are definitely correct or incorrect answers to questions.

EdX suggests that you follow these guidelines and best practices when you use open response assessments in your courses.

- Make sure you have a well designed and clear *rubric*. A good rubric is very important in helping to eliminate ambiguity in the peer grading process.

- Make ORA assignments count toward only a small percentage of the final course grade, or make them ungraded.

- In graded ORA assignments, consider setting the lowest possible score to a number higher than zero, so that learners can earn some credit for the work they have done, even if their peer assessors give them low grades.

- Provide an ungraded practice ORA assignment prior to the first graded ORA assignment in the course, so that learners can understand the peer grading process and get the most out of the eventual graded ORA assignment.

- Consider using ungraded ORA assignments to generate learner interaction and feedback without affecting grades.

- Be wary of including too many ORA assessments in your course. *Peer assessments* are hard work for learners, and having to perform too many peer assessments can have a negative impact on learners' course completion rates.

- Set the **Must Grade** number higher than the **Graded By** number to minimize the chance that some responses will not be peer assessed. EdX recommends a setting such as **Must Grade** = 4 and **Graded By** = 3.

- In ORA assignments, to allow enough time for peer assessments to be performed after learners have submitted their own responses, set the response due date and time at least one week before the peer assessment due date and time. If the response due time and peer assessment due time are close together, and a learner submits a response just before responses are due, other learners may not have time to perform peer assessments before peer assessments are due.

- In discussion posts, provide guidance for peer grading of ORA assignments.

- Consider extending due dates to allow the discussion moderation team to monitor course discussions for questions about, or reactions to, peer grading, and to address issues when necessary.

  If learners raise concerns about ORA assignments in course discussions, course team members can perform actions such as *deleting a learner's history, or "state"* for a problem so that he can submit his assignment again, or *removing a learner response* from peer grading. If there are more widespread issues with peer grading, the course team can reduce the weight of the peer assessment within the final course grade or allow learners to drop the lowest graded assignment from their grades.

Elements of an Open Response Assessment

When you create an open response assessment assignment, you include several elements:

- One or more *prompts*, or questions.

- The *rubric*. One rubric is used to grade all the prompts in the assessment.

- One or more *assessment steps*. Assignments can include a learner training step, a peer assessment step, and a self assessment step.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come first, before the peer and self assessment steps.

For step-by-step instructions for creating an open response assessment, see *Create an Open Response Assessment Assignment*.

Prompts

Each **prompt**, or question, that you want your learners to answer, appears near the top of the page, followed by a field where the learner enters a response. You can require your learners to enter text as a response, or you can allow your learners to both enter text and upload an image.

Note: If learners upload an image, the image file must be a .jpg or .png file, and it must be smaller than 5 MB in size.

This assignment has several steps. In the first step, you'll provide a response to the question. The other steps appear below the **Your Response** field.

Censorship in the Libraries

'All of us can think of a book that we hope none of our children or any other children have taken off the shelf. But if I have the right to remove that book from the shelf -- that work I abhor -- then you also have exactly the same right and so does everyone else. And then we have no books left on the shelf for any of us.' --Katherine Paterson, Author

Write a persuasive essay to a newspaper reflecting your views on censorship in libraries. Do you believe that certain materials, such as books, music, movies, magazines, etc., should be removed from the shelves if they are found offensive? Support your position with convincing arguments from your own experience, observations, and/or reading.

Read for conciseness, clarity of thought, and form.

| 1 | **Your Response** | IN PROGRESS |

Enter your response to the question. You can save your progress and return to complete your response at any time. **After you submit your response, you cannot edit it.**

YOU MAY CONTINUE TO WORK ON YOUR RESPONSE UNTIL YOU SUBMIT IT.

| Save Your Progress | THIS RESPONSE HAS NOT BEEN SAVED. |

Submit your response and move to the next step ▸

When you write each question, you can include helpful information for your learners, such as what they can expect after they submit responses, or the approximate number of words or sentences that their response should have.

Note: Each learner is limited to a total word count of 10,000 for all responses in an ORA assignment.

For more information, see *Step 2. Add Prompts*.

Asking Learners to Upload Images in Responses In open response assessments, you can ask your learners to upload an image as part of their response. If you do this, however, keep the following points in mind.

- You cannot require your learners to upload an image. You can only allow it.

- All responses must include some text. Learners cannot submit a response that contains only an image.

- Learners can submit only one image with each response.

Note: Currently, course teams cannot see any of the images that learners submit. Images are not visible in the body of the assignment in the courseware, and they are not included in the course data package.

Rubric

Your assignment must include a **rubric** that you design. The same rubric is used for peer and self assessments, and the rubric appears when learners begin grading. Learners compare their peers' responses to the rubric.

Rubrics consist of *criteria* and *options*.

- Each criterion has a *name*, a *prompt*, and one or more *options*.

    - The name is a very short summary of the criterion, such as "Ideas" or "Content". Criterion names generally have just one word. Because the system uses criterion names for identification, **the name for each criterion must be unique.** Criterion names do not appear in the rubric that learners see when they are completing peer assessments, but they do appear on the page that shows the learner's final grade.

- – The prompt is a description of the criterion.

- – Options describe how well the response satisfies the criterion.

- Each option has a *name*, an *explanation*, and a *point value*.

Different criteria in the same assignment can have different numbers of options. For example, in the image above, the first criterion has three options and the second criterion has four options.

Note: You can also include criteria that do not have options, but that do include a field where learners can enter feedback. For more information, see *Provide Only Comment Fields for Individual Criteria*.

You can see both criterion and option names when you access assignment information for an individual learner. For more information, see *Accessing Assignment and Learner Metrics*.

When you create your rubric, decide how many points each option will receive, and make sure that the explanation for each option is as specific as possible. For example, one criterion and set of options may resemble the following.

Criterion

Name: Origins

Prompt: Does this response explain the origins of the Hundred Years' War? (5 points possible)

Options

Points	Name	Explanation
0	Not at all	This response does not address the origins of the Hundred Years' War.
1	Dynastic disagree-ment	This response alludes to a dynastic disagreement between England and France, but doesn't reference Edward III of England and Philip VI of France.
3	Edward and Philip	This response mentions the dynastic disagreement between Edward III and Philip VI, but doesn't address the role of Salic law.
5	Salic law	This response explains the way that Salic law contributed to the dynastic disagreement between Edward III and Philip VI, leading to the Hundred Years' War.

Note: For peer grading, the most effective rubrics are as concrete and specific as possible. Many novice learners will be unqualified to make the types of value judgments required for more holistic rubrics. In addition, edX suggests using clear, simple language in rubrics.

For more information, see *Step 3. Add the Rubric*.

Assessment Steps

In your assignment, you also specify the **assessment steps**. You can set the assignment to include a learner training step, a peer assessment step, and a self assessment step.

You can see the type and order of the assessments when you look at the assignment. In the following example, after learners submit a response, they complete a learner training step ("Learn to Assess Responses"), complete peer assessments on other learners' responses ("Assess Peers"), and then complete self assessments ("Assess Your Response").

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before peer or self assessment steps. If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment.

This assignment has several steps. In the first step, you'll provide a response to the question. The other steps appear below the **Your Response** field.

> Censorship in the Libraries
>
> 'All of us can think of a book that we hope none of our children or any other children have taken off the shelf. But if I have the right to remove that book from the shelf -- that work I abhor -- then you also have exactly the same right and so does everyone else. And then we have no books left on the shelf for any of us.' --Katherine Paterson, Author
>
> Write a persuasive essay to a newspaper reflecting your views on censorship in libraries. Do you believe that certain materials, such as books, music, movies, magazines, etc., should be removed from the shelves if they are found offensive? Support your position with convincing arguments from your own experience, observations, and/or reading.
>
> Read for conciseness, clarity of thought, and form.

Current step →

1 | **Your Response**   **Status of current step →**   IN PROGRESS

Enter your response to the question. You can save your progress and return to complete your response at any time. **After you submit your response, you cannot edit it.**

> I think that censorship shouldn't be allowed per se, but that libraries should use judgment when they acquire books. Librarians can also work with kids to make sure the kids know what they're checking out. When I was 13 I was going to check out a book and the librarian told me it had mature content. I told him that was OK and he didn't have a problem with me checking out the book. But I'm glad he was paying enough attention to let me know. I think other kids might not have checked out the book.

YOU MAY CONTINUE TO WORK ON YOUR RESPONSE UNTIL YOU SUBMIT IT.

Save Your Progress   THIS RESPONSE HAS BEEN SAVED BUT NOT SUBMITTED.

Submit your response and move to the next step ▸

Next steps →

2 | Learn to Assess Responses   NOT AVAILABLE

3 | Assess Peers   **Status of next steps →**   NOT AVAILABLE

4 | Assess Your Response   NOT AVAILABLE

Your Grade: Not Started

You have not started this problem yet.

Learner Training Step   When you create a peer assessment assignment, you can include one or more learner training assessments to help learners learn to perform their own assessments. A learner training assessment contains one or more sample responses that you write, together with the scores that you would give the sample responses. Learners review these responses and try to score them the way that you scored them.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before peer and self assessment steps.

In a learner training assessment, the **Learn to Assess Responses** step opens immediately after a learner submits a response. The learner sees one of the sample responses that you created, along with the rubric. The scores that you gave the response do not appear. The learner also sees the number of sample responses that he or she will assess.

The learner selects an option for each of the assignment's criteria, and then selects **Compare your selections with the instructor's selections**. If all of the learner's selections match the selections defined by the course team, the next sample response opens automatically.

If any of the learner's selections differ from those specified by the course team, the learner sees the response again, and the following message appears above the response.

```
Learning to Assess Responses
Your assessment differs from the instructor's assessment of this response. Review the
response and consider why the instructor may have assessed it differently. Then, try
the assessment again.
```

For each of the criteria, the learner sees one of the following two messages, depending on whether the learner's selections matched those of the course team.

```
Selected Options Differ
The option you selected is not the option that the instructor selected.
```

```
Selected Options Agree
The option you selected is the option that the instructor selected.
```

For example, the following learner chose one correct option and one incorrect option.

2 | Learn to Assess Responses

LEARNING TO ASSESS RESPONSES

Your assessment differs from the instructor's assessment of this response. Review the response and consider why the instructor may have assessed it differently. Then, try the assessment again.

TRAINING ESSAY # 1 OF 2

(optional) To train students to perform peer assessments, replace this text with your own sample response for this assignment. Below, list the names of each of the criteria for this assignment, and then specify the name of the option that you would select for this response. Students will assess this response and compare the rubric options that they select with the rubric options that you specified.

If you don't want to provide sample responses and scores, delete the entire 'assessment name="student-training" element.

▼ DETERMINE IF THERE IS A UNIFYING THEME OR MAIN IDEA.

SELECTED OPTIONS DIFFER

The option you selected is not the option that the instructor selected.

◉ **Poor**	Difficult for the reader to discern the main idea. Too brief or too repetitive to establish or maintain a focus.	0 POINTS
○ Fair	Presents a unifying theme or main idea, but may include minor tangents. Stays somewhat focused on topic and task.	3 POINTS
○ Good	Presents a unifying theme or main idea without going off on tangents. Stays completely focused on topic and task.	5 POINTS

▼ ASSESS THE CONTENT OF THE SUBMISSION

SELECTED OPTIONS AGREE

The option you selected is the option that the instructor selected.

○ Poor	Includes little information with few or no details or unrelated details. Unsuccessful in attempts to explore any facets of the topic.	0 POINTS
○ Fair	Includes little information and few or no details. Explores only one or two facets of the topic.	1 POINTS
◉ **Good**	Includes sufficient information and supporting details. (Details may not be fully developed; ideas may be listed.) Explores some facets of the topic.	3 POINTS
○ Excellent	Includes in-depth information and exceptional supporting details that are fully developed. Explores all facets of the topic.	3 POINTS

The learner continues to try scoring the sample response until the learner's scoring for all criteria matches the scoring defined by the course team.

For more information, see *Student Training*.

Peer Assessment Step In the peer assessment step, learners review other learners' responses. For each response, they select an option for each criterion in your rubric based on the response. Learners can also provide text feedback, or comments, on each response.

If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment.

Number of Responses and Assessments When you specify a peer assessment step, you specify the number of responses that each learner has to assess (**Must Grade**) and the number of peer assessments that each response has to receive (**Graded By**) before the assignment is complete.

Note: Because some learners might submit a response without performing any peer assessments, some responses might not receive the required number of assessments. To increase the chance that all responses receive a sufficient number of assessments, you must set the number of responses that learners must assess to be higher than the number of assessments that each response must undergo. For example, if you require each response to receive three assessments, you could require each learner to assess five responses.

If all responses have received assessments, but some learners have not completed the required number of peer assessments, those learners can assess responses that other learners have already assessed. The learner who submitted the response sees the additional peer assessments when he sees his score. However, the additional peer assessments do not count toward the score that the response receives.

Feedback Options By default, learners see a single comment field below the entire rubric. You can also add a comment field to an individual criterion or to several individual criteria. This comment field can contain up to 300 characters.

The comment field appears below the options for the criterion. In the following image, both criteria have a comment field. There is also a field for overall comments on the response.

For more information, see *Step 3. Add the Rubric* and *Provide Only Comment Fields for Individual Criteria*.

Assessing Additional Responses Learners can assess more than the required number of responses. After a learner completes the peer assessment step, the step "collapses" so that only the **Assess Peers** heading is visible.
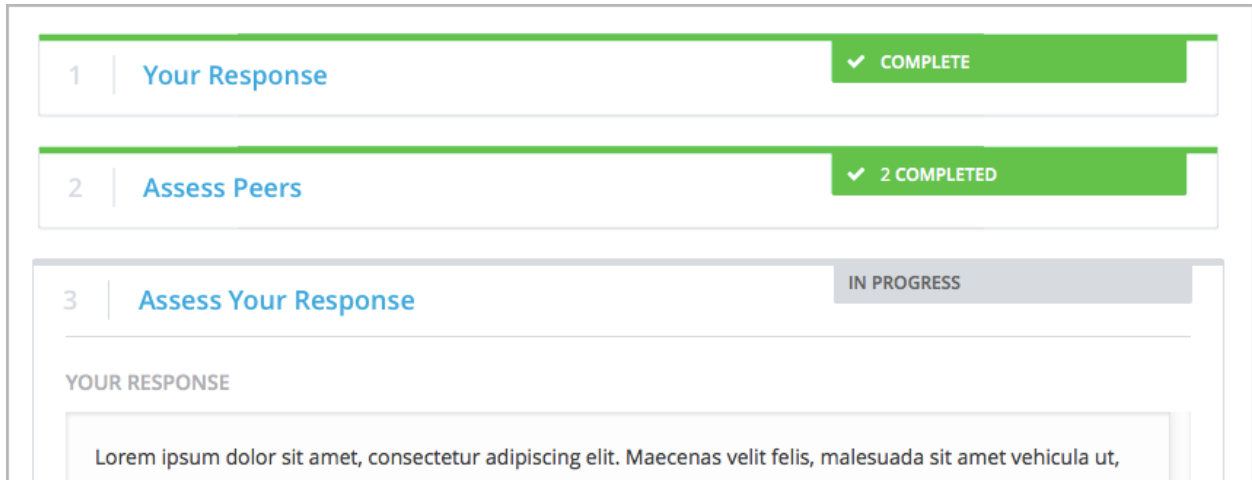
If the learner selects the **Assess Peers** heading, the step expands. The learner can then select **Continue Assessing Peers**.
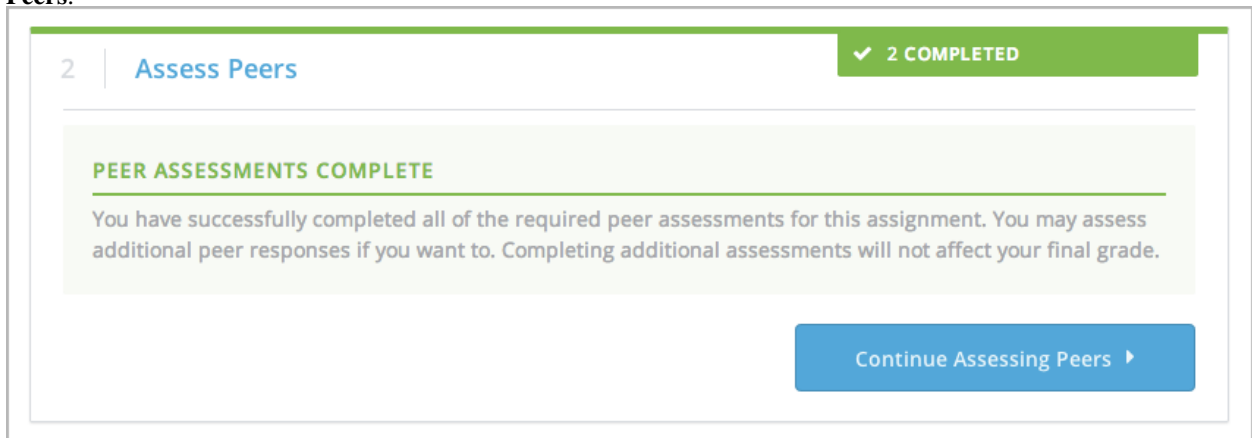
Self Assessment Step

In self assessments, the learner sees his response followed by your rubric. As with peer assessments, the learner compares the rubric to his response and selects an option for each of the criteria.

If you include both peer and self assessments, edX recommends that you include the peer assessment before the self assessment.

How Open Response Assessments Are Scored

In open response assessments that contain both peer assessment and self assessments, only the peer assessment score counts toward the assignment's final grade. The self assessment score is not taken into account. There is no option for weighting the peer and self assessment portions independently.

In open response assessments that include only self assessments, the assignment's final grade is equivalent to the self assessment score.

Note: Given the high level of subjectivity in peer assessments, edX recommends that you make ORA assignments count towards only a small percentage of a course's final grade.

The following sections detail how the scores for peer assessments and self assessments are calculated.

Peer Assessment Scoring

Note: If an open response assessment includes both peer and self assessments, only the peer assessment score counts towards the assignment's final grade. The self assessment score is not taken into account.

Peer assessments are scored by criteria. A number of peer assessors rate a learner's response by each of the required criteria. The learner's score for a particular criterion is the median of all scores that each peer assessor gave that criterion. For example, if the Ideas criterion in a peer assessment receives a 10 from one learner, a 7 from a second learner, and an 8 from a third learner, the Ideas criterion's score is 8.

The learner's final score on a response is the sum of the median scores from all peer assessors for all of the required criteria.

For example, a response might have received the following scores from peer assessors.

Criterion Name	Peer 1	Peer 2	Peer 3	Median
Ideas (out of 10)	10	7	8	**8**
Content (out of 10)	7	9	8	**8**
Grammar (out of 5)	4	4	5	**4**

To calculate the final score for the response, add the median scores that were given for each criterion, as follows.

Ideas median (8/10) + Content median (8/10) + Grammar median (4/5) = final score (20/25)

Note: Remember that final scores are calculated by criteria, not by individual assessor. Therefore, the score for the response is not the median of the scores that each individual peer assessor gave the response.

For information on grades for learner submissions that you have cancelled and removed from peer assessment, refer to *Remove a Learner's Response from Peer Grading*.

Self Assessment Scoring

Note: If an open response assessment includes both peer and self assessments, the self assessment score does not count toward the final grade.

If an open response assessment includes only self assessments, the assignment's final grade is equivalent to the self assessment score.

Self assessments are scored by criteria. Each learner rates herself on each criterion, using the rubric. The learner's final score on a response is the total number of earned points, out of the total possible points.

Top Responses

You can include a **Top Responses** section that shows the top-scoring responses that learners have submitted for the assignment, along with the scores for those responses. The **Top Responses** section appears below the learner's score information after the learner finishes every step in the assignment.

You can allow the **Top Responses** section to show between 1 and 100 responses. Keep in mind, however, that each response might be up to 300 pixels in height in the list. (For longer responses, learners can scroll to see the entire response.) EdX recommends that you specify 20 or fewer responses to prevent the page from becoming too long.

Note: It may take up to an hour for a high-scoring response to appear in the **Top Responses** list.

If a high-scoring response is *removed from peer assessment* it is also removed from the **Top Responses** list.

For more information, see *Step 7. Show Top Responses*.

7.26.2 Create an Open Response Assessment Assignment

Creating an open response assessment is a multi-step process. Each step is covered in detail below.

For more information about the components of an open response assessment, see *Open Response Assessments*. For information about viewing metrics and learner responses for released open response assessments, see *Accessing Assignment and Learner Metrics*.

Step 1. Create the Component

To create the component for your open response assessment, complete these steps.

1. In Studio, open the unit where you want to create the open response assessment.

2. Under **Add New Component**, select **Problem**, select the **Advanced** tab, and then select **Peer Assessment**.

3. In the Problem component that appears, select **Edit**.

Note: After you publish an ORA assignment, you can no longer change the structure of the rubric or the point values associated with each criterion in the rubric. If you correct typographical errors in the text of the rubric, only learners who have not yet started the assignment will see the corrections. However, you can modify due dates and the weight of the ORA assignment after you publish an ORA assignment.

Step 2. Add Prompts

To add prompts, or questions, complete these steps.

1. In the open response assessment component editor, select the **Prompt** tab.

2. Add the text of your question in the text field. Replace any default text if necessary.

3. Select **Add a Prompt** to add another prompt in the problem.

Add Formatting or Images to a Prompt

Currently, you cannot add text formatting or images inside the Peer Assessment component. To include formatting or images within the text of a prompt, you can add an HTML component that contains your text above the Peer Assessment component, and leave the text field in the **Prompt** tab blank. The instructions for the peer assessment still appear above the **Your Response** field.

Allow Learners to Submit Images (optional)

To allow learners to submit an image with a response, complete these steps.

1. In the open response assessment component editor, select the **Settings** tab.

2. For **Allow Image Responses**, select **True**.

Note:

- The image file must be a .jpg or .png file, and it must be smaller than 5 MB in size.

- Currently, course teams cannot see any of the images that learners submit. Images are not visible in the body of the assignment in the courseware, and they are not included in the course data package.

- You can allow learners to upload an image, but you cannot require it.

- Learners can only submit one image with each response.

- All responses must contain text. Learners cannot submit a response that contains only an image.

Step 3. Add the Rubric

In this step, you add your rubric and provide your learners with feedback options. You add one rubric for each problem, regardless of the number of prompts in the problem.

For each step below, replace any default text with your own text.

Note: All open response assessments include a feedback field below the rubric so that learners can provide written feedback on a peer's overall response. You can also allow or require learners to provide feedback for individual criteria. See step 2.4 below for instructions. For more information, see *Feedback Options*.

To add the rubric, complete these steps.

1. In the open response assessment component editor, select the **Rubric** tab.

2. In the first **Criterion** section, enter the name and prompt text of your first criterion.

3. In the first **Option** section, enter the name, explanation, and point value for the first option.

4. In the next **Option** section, enter the name, explanation, and point value for the next option.

5. Repeat step 4 for each option. If you need to add more options, select **Add Option**.

6. Next to **Feedback for This Criterion**, select a value in the dropdown list.

   - If you do not want learners to provide feedback for this individual criterion, select **None**.

   - If you want to require learners to provide feedback, select **Required**.

   - If you want to allow learners to provide feedback, but not require it, select **Optional**.

7. Follow the instructions in steps 2-6 to add your remaining criteria. If you need to add more criteria, select **Add Criterion** at the end of the list of criteria.

8. Include instructions for learners to provide overall written feedback on their peers' responses. You can leave the default text in the **Feedback Instructions** field or replace it with your own text.

Note: After you publish an ORA assignment, you can no longer change the structure of the rubric or the point values associated with each criterion in the rubric. If you correct typographical errors in the text of the rubric, only learners who have not yet started the assignment will see the corrections. However, you can modify due dates and the weight of the ORA assignment after you publish an ORA assignment.

Provide Only Comment Fields for Individual Criteria

When you add a comment field to a criterion, the comment field appears below the options for the criterion. You can also provide a comment field, but no options.

In the following image, the first criterion has a comment field but no options. The second includes options, but does not have a comment field.

Read and assess the following response from one of your peers.

ASSESSMENT # 1 OF 5

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Criterion 1: Comment field with no options

▼ DESCRIBE THE UNIFYING THEME OR MAIN IDEA IN THE RESPONSE.

Comments

Criterion 2: Options without comment field

▼ ASSESS THE CONTENT OF THE SUBMISSION

○ Poor	Includes little information with few or no details or unrelated details. Unsuccessful in attempts to explore any facets of the topic.	0 POINTS
○ Fair	Includes little information and few or no details. Explores only one or two facets of the topic.	1 POINTS
○ Good	Includes sufficient information and supporting details. (Details may not be fully developed; ideas may be listed.) Explores some facets of the topic.	3 POINTS
○ Excellent	Includes in-depth information and exceptional supporting details that are fully developed. Explores all facets of the topic.	3 POINTS

Overall comments on the response

(OPTIONAL) WHAT ASPECTS OF THIS RESPONSE STOOD OUT TO YOU? WHAT DID IT DO WELL? HOW COULD IT IMPROVE?

I noticed that this response...

To provide a comment field without options, complete these steps.

1. In the criterion, select **Remove** to remove, or delete, all the options.

2. Next to **Feedback for This Criterion**, select **Required** in the dropdown list.

Step 4. Specify the Assignment Name and Response Dates

To specify a name for the assignment as well as start and due dates for all student responses, complete these steps.

1. In the component editor, select the **Settings** tab.

2. Next to **Display Name**, type the name you want to give the assignment.

3. Next to **Response Start Date** and **Response Start Time**, enter the date and time when you want learners to be able to begin submitting responses. Note that all times are in Universal Coordinated Time (UTC).

4. Next to **Response Due Date** and **Response Due Time**, enter the date and time by which all learner responses must be submitted. Note that all times are in Universal Coordinated Time (UTC).

Note: Unlike other problem types, ORA assignments are not governed by the subsection due date. Due dates for each ORA assignment are set in the assignment's settings.

Note: EdX recommends that you set the response due date at least one week before the peer assessment due date and time, to allow enough time for peer assessments to be performed after learners have submitted their own responses. If the response due time and peer assessment due time are close together, and a learner submits a response just before responses are due, other learners may not have time to perform peer assessments before peer assessments are due. For details, see *Best Practices for Open Response Assessments*.

Step 5. Select Assignment Steps

Open response assessment assignments can include learner training, peer assessment, and self assessment steps.

Note: If you include a learner training step, you must also include a peer assessment step. The learner training step must come before peer or self assessment steps. If you include both peer and self assessment steps, edX recommends that you place the peer assessment before the self assessment.

To add steps to the open response assignment, complete these actions.

1. In the component editor, select the **Settings** tab.

2. Scroll down past the **Allow Image Responses** and **Allow Latex Responses** fields.

3. Locate the following headings.

   - **Step: Student Training**

   - **Step: Peer Assessment**

   - **Step: Self Assessment**

   Select the check boxes for the steps that you want the assignment to include.

4. (optional) To change the order of the steps, drag the steps into the order that you want.

Note: If you include a student training step, make sure it is the first step in the assignment.

Step 6. Specify Step Settings

After you select the steps that you want, you can specify settings for those steps.

Note: If you make changes to a step, but then you clear the check box for that step, the step will no longer be part of the assignment and your changes will not be saved.

Student Training

For the student training step, you enter one or more responses that you have created, then select an option for each criterion in your rubric.

Note: You must enter your complete rubric on the **Rubric** tab before you can select options for the student training responses. If you later change one of your criteria or any of its options, you must also update the student training step.

To add and score student training responses, follow these steps.

1. Under **Step: Student Training**, locate the first **Scored Response** section.

2. In the **Response** field, enter the text of your example response.

3. Under **Response Score**, for each criterion, select the option that you want.

For more information, see *Learner Training Step*.

Peer Assessment

For the peer assessment step, you specify the number of responses that each learner must grade, the number of learners who must grade each response, and start and due dates. All fields are required.

To specify peer assessment settings, follow these steps.

1. Locate the **Step: Peer Assessment** heading.

2. Next to **Must Grade**, enter the number of responses that each learner must grade.

3. Next to **Graded By**, enter the number of learners that must grade each response.

4. Next to **Start Date** and **Start Time**, enter the date and time when learners can begin assessing their peers' responses. All times are in Universal Coordinated Time (UTC).

5. Next to **Due Date** and **Due Time**, enter the date and time by which all peer assessments must be complete. All times are in UTC.

Self Assessment

For the self assessment step, you specify when the step starts and ends.

1. Locate the **Step: Self Assessment** heading.

2. Next to **Start Date** and **Start Time**, enter the date and time when learners can begin assessing their peers' responses. All times are in Universal Coordinated Time (UTC).

3. Next to **Due Date** and **Due Time**, enter the date and time by which all peer assessments must be complete. All times are in UTC.

Step 7. Show Top Responses

To allow learners to see the top-scoring responses for the assignment, you specify a number on the **Settings** tab.

1. In the component editor, select the **Settings** tab.

2. In the **Top Responses** field, specify the number of responses that you want to appear in the **Top Responses** section below the learner's final score. If you do not want this section to appear, set the number to 0. The maximum number is 100.

Note: Because each response can be up to 300 pixels in height, we recommend that you set the number of top responses to 20 or lower, to prevent the page from becoming too long.

For more information, see *Top Responses*.

Step 8. Test the Assignment

To test your assignment, set up the assignment in your course, set the section or subsection date in the future, and ask a group of beta users to submit responses and grade each other. The beta testers can then let you know if they found the question and the rubric easy to understand or if they had any problems with the assignment.

For more information about beta testing, see *Beta Testing a Course*.

7.26.3 Accessing Assignment and Learner Metrics

After your open response assessment assignment has been released, you can access information about the number of learners in each step of the assignment or the performance of individual learners. This information is available in the **Course Staff Information** section at the end of each assignment. To access learner information, open the assignment in the courseware, scroll to the bottom of the assignment, and then select the black **Course Staff Information** banner.

When you access a specific learner's information for an open response assessment, you can view his responses and, if necessary, *cancel the learner's submission* so that it is not included in peer assessments.

View Metrics for Individual Steps

You can check the number of learners who have completed, or are currently working through, the following steps:

- Submitted responses.
- Completed peer assessments.
- Waiting to assess responses or receive grades.
- Completed self assessments.
- Completed the entire assignment.

To find this information, open the assignment in the courseware, scroll to the bottom of the assignment, and then select **Course Staff Information**.

The **Course Staff Information** section expands, and you can see the number of learners who are currently working through (but have not completed) each step of the problem.

Access Information for a Specific Learner

You can access information about an individual learner's performance on a peer assessment assignment, including:

- The learner's response.
- The peer assessments that other learners performed on the learner's response, including feedback on individual criteria and on the overall response.
- The peer assessments that the learner performed on other learners' responses, including feedback on individual criteria and on the overall responses.
- The learner's self assessment.

In the following example, you can see the performance information for a specific learner. This learner's response received one peer assessment, and the learner completed a peer assessment on one other learner's response. The learner also completed a self assessment.

Get Student Info

11b6417ba114b1882da4b18b64a

Submit

Student Information

Student Response

Maecenas ac leo egestas, pellentesque arcu id, tempus lorem. Cras suscipit venenatis ante, ac sodales libero scelerisque eget. Cras felis lectus, commodo vitae felis eget, facilisis bibendum nisl. Aenean aliquam odio a rhoncus eleifend. Vivamus ut ipsum congue sapien feugiat semper sit amet et diam. Aenean iaculis egestas arcu, sit amet fringilla magna tincidunt ullamcorper. Vivamus hendrerit neque ac metus hendrerit, nec placerat ipsum varius. In nulla est, dignissim eu nunc eu, pulvinar vehicula sapien.

Peer Assessments for This Student

Peer 1:

CRITERION	SELECTED OPTION	FEEDBACK	POINTS	POINTS POSSIBLE
Ideas	Fair	Fusce velit neque, ultricies in vehicula id, fermentum quis arcu. Pellentesque felis libero, sollicitudin quis tempus eu, ornare in magna. Quisque sagittis ultricies vehicula.	3	5
Content	Fair		1	3

Overall Feedback

Cras suscipit venenatis ante, ac sodales libero scelerisque eget. Cras felis lectus, commodo vitae felis eget, facilisis bibendum nisl. Aenean aliquam odio a rhoncus eleifend. Vivamus ut ipsum congue sapien feugiat semper sit amet et diam.

Peer Assessments Completed by This Student

Assessment 1:

CRITERION	SELECTED OPTION	FEEDBACK	POINTS	POINTS POSSIBLE
Ideas	Good	Pellentesque ultricies quis sapien ac scelerisque. Nullam ultricies sapien sit amet dolor congue, vel adipiscing erat lobortis.	5	5
Content	Excellent		3	3

Overall Feedback

Nunc ac ligula vel tortor volutpat volutpat non at ligula.

To determine whether this learner has received the required number of assessments from other learners and has completed the required number of assessments for other learners, refer to the **Graded By** and **Must Grade** values that were set for the open response assessment assignment in Studio. For more information about these settings, see *Specify Step Settings*.

For details about accessing information for a specific learner, and for an example that shows a learner's response with more assessments, see *Access a Specific Learner's Information*.

Access a Specific Learner's Information

1. In the LMS, go to the peer assessment assignment that you want to see.

2. Scroll to the bottom of the problem, and select the black **Course Staff Information** banner.

3. In the **Get Student Info** box, enter the learner's username, and select **Submit**.

The learner's information appears below the **Get Student Info** box.

The following example shows:

- The learner's response.

- The two peer assessments for the response.

- The two peer assessments the learner completed.

- The learner's self assessment.

For a larger view, select the image so that it opens by itself in the browser window, and then click anywhere on the image that opens.

Get Student Info

11b6417ba114b1882da4b18b64a

Submit

Student Information

Student Response

Maecenas ac leo egestas, pellentesque arcu id, tempus lorem. Cras suscipit venenatis ante, ac sodales libero scelerisque eget. Cras felis lectus, commodo vitae felis eget, facilisis bibendum nisl. Aenean aliquam odio a rhoncus eleifend. Vivamus ut ipsum congue sapien feugiat semper sit amet et diam. Aenean iaculis egestas arcu, sit amet fringilla magna tincidunt ullamcorper. Vivamus hendrerit neque ac metus hendrerit, nec placerat ipsum varius. In nulla est, dignissim eu nunc eu, pulvinar vehicula sapien.

Peer Assessments for This Student

Peer 1:

CRITERION	SELECTED OPTION	FEEDBACK	POINTS	POINTS POSSIBLE
Ideas	Fair	*Fusce velit neque, ultricies in vehicula id, fermentum quis arcu. Pellentesque felis libero, sollicitudin quis tempus eu, ornare in magna. Quisque sagittis ultricies vehicula.*	3	5
Content	Fair		1	3

Overall Feedback

Cras suscipit venenatis ante, ac sodales libero scelerisque eget. Cras felis lectus, commodo vitae felis eget, facilisis bibendum nisl. Aenean aliquam odio a rhoncus eleifend. Vivamus ut ipsum congue sapien feugiat semper sit amet et diam.

Peer 2:

CRITERION	SELECTED OPTION	FEEDBACK	POINTS	POINTS POSSIBLE
Ideas	Fair	*Fusce velit neque, ultricies in vehicula id, fermentum quis arcu. Pellentesque felis libero, sollicitudin quis tempus eu,*	3	5
Content	Excellent	*Pellentesque ultricies quis sapien ac scelerisque.*	3	3

Overall Feedback

Remove a Learner's Response from Peer Grading

If you use open response assessments, learners might alert you to vulgar, abusive, or otherwise inappropriate responses that they have seen while performing peer assessments. In such a situation you can *locate* and cancel the submission. Doing so removes the inappropriate response from peer assessments so that it is no longer shown to other learners.

Note: Removing a learner's submission is an irreversible action.

When you cancel an inappropriate submission, the response is immediately removed from the pool of submissions available for peer assessment. If the inappropriate response has already been sent to other learners for peer assessment, it is also removed from their queue. However, if any learner has already graded the inappropriate response, it is counted as one of the submissions they have graded.

Note: After you remove an inappropriate response from peer assessment, you decide whether the learner who submitted that response is allowed to submit a replacement response. If you do not want to allow the learner to submit a replacement response, you do not need to take any additional action. The learner receives a grade of zero for the entire submission. To allow the learner to resubmit a response for a cancelled submission, *reset the learner's attempts for the problem*.

Remove a submission from peer assessment by completing these steps.

1. In the LMS, go to the peer assessment assignment that contains the submission you want to remove.

2. Scroll to the bottom of the problem, then select the black **Course Staff Information** banner.

3. Scroll down to the **Get Student Info** box, enter the learner's username in the box, and select **Submit**.

    The learner's information appears below the **Get Student Info** box.

4. Scroll down to the **Student Response** section and locate the submission you want to remove.
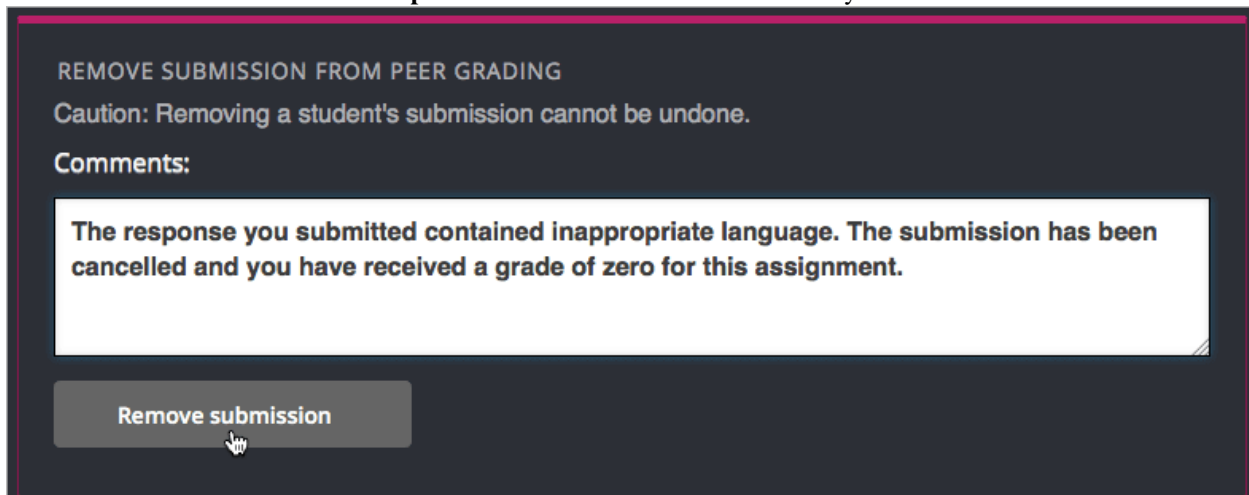
5. Enter a comment to document or explain the removal. This comment appears to the learner when she views her response in the open response assessment problem.

6. Click **Remove submission**.

    The inappropriate submission is removed from peer assessment. When you access this learner's information again, instead of the response, you see a note showing the date and time that the submission was removed, and the comments that you entered.

    Removed submissions are also removed from the list of Top Responses if they were previously listed.

Locate a Specific Submission in an ORA Assignment

If you are alerted to an inappropriate ORA submission that you want to cancel and *remove from peer assessment*, locate the specific submission by following these steps.

1. Ask the person who reported the incident to send you a sample of text from the inappropriate post.

2. Contact your edX program manager to request a data download of ORA responses for your course.

   You will receive the download as a spreadsheet or in .csv file format.

3. Search the spreadsheet for text that matches the sample text from the inappropriate post.

4. From any matching entries in the spreadsheet, locate the username of the learner who posted the submission.

5. Make a note of the username, and follow the steps to *remove a learner response from peer grading*.

7.27 Periodic Table Tool

You can create an interactive periodic table of the elements to help your students learn about various elements' properties. In the table below, detailed information about each element appears as the student moves the mouse over the element.

7.27.1 Create the Periodic Table Tool

To create a periodic table, you need the following files:

- Periodic-Table.js

- Periodic-Table.css

- Periodic-Table-Colors.css

- PeriodicTableHTML.txt

To download all of these files in a .zip archive, click http://files.edx.org/PeriodicTableFiles.zip.

To create the periodic table, you need an HTML component.

1. Upload all of the files listed above *except PeriodicTable.txt* to the **Files & Uploads** page in your course.

2. In the unit where you want to create the problem, click **HTML** under **Add New Component**, and then click **HTML**.

3. In the component that appears, click **Edit**.

4. In the component editor, switch to the **HTML** tab.

5. Open the PeriodicTable.txt file in any text editor.

6. Copy all of the text in the PeriodicTable.txt file, and paste it into the HTML component editor. (Note that the PeriodicTableHTML.txt file contains over 6000 lines of code. Paste all of this code into the component editor.)

7. Click **Save**.

7.28 Poll Tool

This section describes how to include polls in your course.

- *Overview*
- *Enable the Poll Tool*
- *Add a Poll in edX Studio*
- *Add a Poll in OLX*
- *Editing Published Polls*
- *View Poll Results*

7.28.1 Overview

You can include polls in your course to gather learners' opinions on various questions.

For a poll, you configure one question and multiple possible answers. If you need to ask multiple questions, use the *Survey Tool*.

The following example poll has four possible answers to the question.

After learners submit their answers to the poll question, they see the poll results that have been gathered at this time, unless the poll has been configured to hide results.

7.28.2 Enable the Poll Tool

Before you can add a poll to your course, you must enable the poll tool in Studio or OLX.

To enable the Poll tool in your course, you add **"poll"** to the **Advanced Modules List** in Advanced Settings.

Enable the Poll Tool in Studio

1. From the **Settings** menu, select **Advanced Settings**.

2. In the **Advanced Module List** field, place your cursor between the supplied pair of square brackets, and then type **"poll"**. If you see other values in this field, add a comma after the closing quotation mark for the last value, and then type **"poll"**.
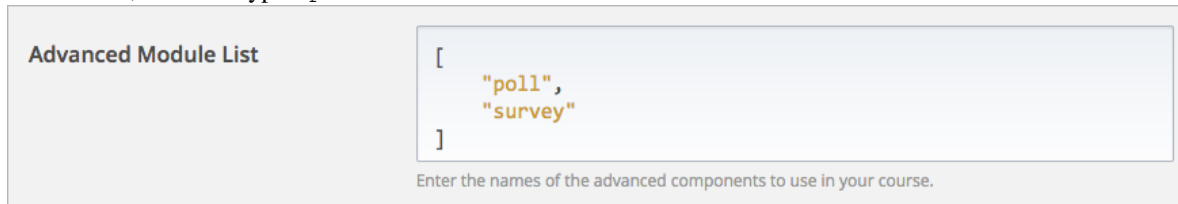
3. Select **Save Changes**.

Studio reformats the policy key you just entered to indent it on a new line.

Enable the Poll Tool in OLX

To enable polls in your course, you edit the XML file that defines the course structure.

Open the XML file for the course in the `course` directory. In the `course` element's `advanced-modules` attribute, add the string `poll`.

For example, the following XML code enables polls in a course.

```
<course advanced_modules="[&quot;survey&quot;,
    &quot;poll&quot;]" display_name="Sample Course"
    start="2015-01-01T00:00:00Z">
    ...
</course>
```

7.28.3 Add a Poll in edX Studio

You must *enable the poll* tool before you add the component.

1. On the Course Outline page, open the unit where you want to add the poll.

2. Under **Add New Component** click **Advanced**, and then select **Poll**.

   The new component is added to the unit, with the default poll that contains three answer fields.

3. In the new component, select **Edit**.

4. In the **Display Name** field, enter the name for the component.

5. In the **Question/Prompt** field, enter text that learners see above the poll. You can use Markdown in this field.

6. In the **Feedback** field, enter text that learners see after they submit a responses. You can use Markdown in this field.

7. In the **Private Results** field, to hide poll results from learners, select **True**. If you leave the default value, **False**, learners see poll results after they submit responses.

8. In the **Maximum Submissions** field, change the value to the number of times that you want to allow learners to submit responses. Enter **0** to allow unlimited responses.

Note: If you allow learners to submit responses more than once, you should set **Private Results** to **True**. Otherwise, learners will be able to change their responses after seeing others' responses.

---

9. Configure answers for the poll.

   (a) In each **Answer** field, enter the answer text that learners see.

   (b) You must enter either text or an image path, or both, for each answer. To enter an image, use the *Studio URL* for the image.

   (c) If you use an image, you must enter useful alternative text in the **Image alternate text** field for non-sighted users.

   (d) To add answers, select **Add answer** at the bottom of the editor. New answers are added at the bottom of the list.

   (e) To change the order of answers, select the up and down buttons next to each answer.

   (f) To remove an answer, select **Delete** next to the answer.

10. Select **Save**.

7.28.4 Add a Poll in OLX

To add a poll XBlock in OLX, you create the `poll` element. You can embed the `poll` element in the `vertical` element, or you can create the `poll` element as a standalone file that you reference in the vertical.

The following example shows the OLX definition for a poll with four answers.

```
<poll url_name="f4ae7de0006f426aa4eed4b0b8112da5" xblock-family="xblock.v1"
  feedback="Feedback"
  display_name="Poll"
  private_results="false"
  question="What is your favorite color?"
  max_submissions="1"
  answers="[
          [&quot;R&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt 1&quot;,
              &quot;label&quot;: &quot;Red&quot;
            }
          ],
          [&quot;B&quot;,
            {
              &quot;img&quot;: &quot;/static/image.png&quot;,
              &quot;img_alt&quot;: &quot;Alt 2&quot;,
              &quot;label&quot;: &quot;Blue&quot;
```

```
                    }
            ],
            [&quot;G&quot;,
                {
                    &quot;img&quot;: &quot;/static/image.png&quot;,
                    &quot;img_alt&quot;: &quot;Alt3&quot;,
                    &quot;label&quot;: &quot;Green&quot;
                }
            ],
            [&quot;O&quot;,
                {
                    &quot;img&quot;: &quot;/static/image.png&quot;,
                    &quot;img_alt&quot;: &quot;Alt 4&quot;,
                    &quot;label&quot;: &quot;Other&quot;
                }
            ]
        ]
"/>
```

poll Element Attributes

The following table describes the attributes of the `poll` element.

Attribute	Description
`url_name`	The unique identifier of the poll.
`xblock-family`	The XBlock version used. Must be `xblock.v1`.
`private_results`	Whether the poll results are shown to learners (`true`) or not (`false`).
`display_name`	The display name for the poll.
`question`	The prompt for the poll.
`feedback`	The text shown to learners after they submit a response.
`max_submissions`	The number of times a learner can submit poll answers. Use `0` to allow unlimited submissions. If you use a value other than `1`, set `private_results` to `true`. Otherwise, learners will be able to change their responses after seeing others' responses.
`answers`	An array of answers in the poll. Each answer has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the answer image. • `img_alt`, the alternative text for the image. • `label`, the answer text. Each answer must have a value for `img` or `label`, or both.

7.28.5 Editing Published Polls

Do not publish a poll until you have completed and tested it. You should avoid changing a poll after learners have begun to use it.

If you must edit a poll after learners have submitted answers take into account the following implications.

- If you edit the value of an answer, previous submissions are associated with the new answer value. This change can result in an inaccurate picture of the responses.

- If you change the poll so that previous submissions are invalid, by removing an answer, those submissions are deleted when learners next view the unit. Learners with invalid submissions can submit new responses.

7.28.6 View Poll Results

When you view the poll as a course staff member, you can view results of the poll in the courseware.

Select **View results** in the poll.

The results of the poll are then displayed.

7.29 Poll Tool for OLX

You can run polls in your course so that your students can share opinions on different questions.

Note: Creating a poll requires you to export your course, edit some of your course's XML files in a text editor, and then re-import your course. We recommend that you create a backup copy of your course before you create the poll. We also recommend that you only edit the files that will contain polls in the text editor if you're very familiar with editing XML.

7.29.1 Terminology

Sections, subsections, units, and components have different names in the **Course Outline** view and in the list of files that you'll see after you export your course and open the .xml files for editing. The following table lists the names of these elements in the **Course Outline** view and in a list of files.

Course Outline View	File List
Section	Chapter
Subsection	Sequential
Unit	Vertical
Component	Discussion, HTML, problem, or video

For example, when you want to find a specific section in your course, you'll look in the **Chapter** folder when you open the list of files that your course contains. To find a unit, you'll look in the **Vertical** folder.

7.29.2 Create a Poll

1. In the unit where you want to create the poll, create components that contain all the content that you want *except* for the poll. Make a note of the 32-digit unit ID that appears in the **Unit Identifier** field under **Unit Location**.

2. Export your course. For information about how to do this, see *Exporting and Importing a Course*. Save the .tar.gz file that contains your course in a memorable location so that you can find it easily.

3. Locate the .tar.gz file that contains your course, and then unpack the .tar.gz file so that you can see its contents in a list of folders and files.

- To do this on a Windows computer, you'll need to download a third-party program. For more information, see How to Unpack a tar File in Windows, How to Extract a Gz File, The gzip Home Page, or the Windows section of the How to Open .tar.gz Files page.

- For information about how to do this on a Mac, see the Mac OS X section of the How to Open .tar.gz Files page.

4. In the list of folders and files, open the **Vertical** folder.

Note: If your unit is not published, open the **Drafts** folder, and then open the **Vertical** folder in the **Drafts** folder.

---

5. In the **Vertical** folder, locate the .xml file that has the same name as the unit ID that you noted in step 1, and then open the file in a text editor such as Sublime 2. For example, if the unit ID is e461de7fe2b84ebeabe1a97683360d31, you'll open the e461de7fe2b84ebeabe1a97683360d31.xml file.

The file contains a list of all the components in the unit, together with the URL names of the components. For example, the following file contains an HTML component followed by a Discussion component.

```
<vertical display_name="Test Unit">
 <html url_name="b59c54e2f6fc4cf69ba3a43c49097d0b"/>
 <discussion url_name="8320c3d511484f3b96bdedfd4a44ac8b"/>
</vertical>
```

6. Add the following poll code in the location where you want the poll. Change the text of the prompt to the text that you want.

```
<poll_question display_name="Poll Question">
  <p>Text of the prompt</p>
  <answer id="yes">Yes</answer>
  <answer id="no">No</answer>
</poll_question>
```

In the example above, if you wanted your poll to appear between the HTML component and the Discussion component in the unit, your code would resemble the following.

```
<vertical display_name="Test Unit">
 <html url_name="b59c54e2f6fc4cf69ba3a43c49097d0b"/>
 <poll_question display_name="Poll Question">
   <p>Text of the prompt</p>
   <answer id="yes">Yes</answer>
   <answer id="no">No</answer>
 </poll_question>
 <discussion url_name="8320c3d511484f3b96bdedfd4a44ac8b"/>
</vertical>
```

7. After you add the poll code, save and close the .xml file.

8. Re-package your course as a .tar.gz file.

- For information about how to do this on a Mac, see How to Create a Tar GZip File from the Command Line.

- For information about how to do this on a Windows computer, see How to Make a .tar.gz on Windows.

9. In Studio, re-import your course. You can now review the poll question and answers that you added in Studio.

Note:

- Although polls render correctly in Studio, you cannot edit them in Studio. You will need to follow the export/import process outlined above to make any edits to your polls.

- A .csv file that contains student responses to the problem is not currently available for polls. However, you can obtain the aggregate data directly in the problem.

7.29.3 Format description

The main tag of Poll module input is:

```
<poll_question> ... </poll_question>
```

`poll_question` can include any number of the following tags: any xml and `answer` tag. All inner xml, except for `answer` tags, we call "question".

poll_question tag

Xmodule for creating poll functionality - voting system. The following attributes can be specified for this tag:

```
name - Name of xmodule.
[display_name| AUTOGENERATE] - Display name of xmodule. When this attribute is not defined - display
[reset | False] - Can reset/revote many time (value = True/False)
```

answer tag

Define one of the possible answer for poll module. The following attributes can be specified for this tag:

```
id - unique identifier (using to identify the different answers)
```

Inner text - Display text for answer choice.

7.29.4 Example

Example of poll

```
<poll_question name="second_question" display_name="Second question">
    <h3>Age</h3>
    <p>How old are you?</p>
    <answer id="less18">&lt; 18</answer>
    <answer id="10_25">from 10 to 25</answer>
    <answer id="more25">&gt; 25</answer>
</poll_question>
```

Example of poll with unable reset functionality

```
<poll_question name="first_question_with_reset" display_name="First question with reset"
    reset="True">
    <h3>Your gender</h3>
    <p>You are man or woman?</p>
    <answer id="man">Man</answer>
    <answer id="woman">Woman</answer>
</poll_question>
```

7.30 Problem with Adaptive Hint

A problem with an adaptive hint evaluates a student's response, then gives the student feedback or a hint based on that response so that the student is more likely to answer correctly on the next attempt. These problems can be text input problems or multiple choice problems.

7.30.1 Create a Problem with an Adaptive Hint

To create the above problem:

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Problem with Adaptive Hint**.

3. In the component that appears, click **Edit**.

4. In the component editor, replace the example code with the code below.

5. Click **Save**.

```
<problem>
    <text>
        <script type="text/python" system_path="python_lib">
  def test_str(expect, ans):
    print expect, ans
    ans = ans.strip("'")
    ans = ans.strip('"')
    return expect == ans.lower()

  def hint_fn(answer_ids, student_answers, new_cmap, old_cmap):
    aid = answer_ids[0]
    ans = str(student_answers[aid]).lower()
    print 'hint_fn called, ans=', ans
    hint = ''
    if '10' in ans:
       hint = 'If the ball costs 10 cents, and the bat costs one dollar more than the ball,
       how much does the bat cost? If that is the cost of the bat, how much do the ball and
       bat cost together?'
    elif '.05' in ans:
       hint = 'Make sure to enter the number of cents as a whole number.'

    if hint:
      hint = "&lt;font color='blue'&gt;Hint: {0}&lt;/font&gt;".format(hint)
      new_cmap.set_hint_and_mode(aid,hint,'always')
        </script>
```

```
            <p>If a bat and a ball cost $1.10 together, and the bat costs $1.00 more than the
            ball, how much does the ball cost? Enter your answer in cents, and include only
            the number (that is, do not include a $ or a ¢ sign).</p>
            <p>
                <customresponse cfn="test_str" expect="5">
                    <textline correct_answer="5" label="How much does the ball cost?"/>
                    <hintgroup hintfn="hint_fn"/>
                </customresponse>
            </p>
        </text>
</problem>
```

7.30.2 Problem with Adaptive Hint XML

Template

```
<problem>
  <text>
    <script type="text/python" system_path="python_lib">
def test_str(expect, ans):
  print expect, ans
  ans = ans.strip("'")
  ans = ans.strip('"')
  return expect == ans.lower()

def hint_fn(answer_ids, student_answers, new_cmap, old_cmap):
  aid = answer_ids[0]
  ans = str(student_answers[aid]).lower()
  print 'hint_fn called, ans=', ans
  hint = ''
  if 'incorrect answer 1' in ans:
    hint = 'hint for incorrect answer 1'
  elif 'incorrect answer 2' in ans:
    hint = 'hint for incorrect answer 2'

  if hint:
    hint = "&lt;font color='blue'&gt;Hint: {0}&lt;/font&gt;".format(hint)
    new_cmap.set_hint_and_mode(aid,hint,'always')
</script>
    <p>TEXT OF PROBLEM</p>
    <p>
      <customresponse cfn="test_str" expect="ANSWER">
        <textline correct_answer="answer" label="LABEL TEXT"/>
        <hintgroup hintfn="hint_fn"/>
      </customresponse>
    </p>
  </text>
</problem>
```

Note: If the hints that you supply include characters, the letters must be lowercase.

Tags

- <text>: Surrounds the script and text in the problem.

- `<customresponse>`: Indicates that this problem has a custom response.

- `<textline>`: Creates a response field in the LMS where the student enters a response.

- `<hintgroup>`: Specifies that the problem contains at least one hint.

Tag: `<customresponse>`

Attributes

(none)

Children

- `<textline>`

- `<hintgroup>`

Tag: `<textline>`

Attributes

Attribute	Description
label (required)	Contains the text of the problem.
size (optional)	Specifies the size, in characters, of the response field in the LMS.
hidden (optional)	If set to "true", students cannot see the response field.
cor- rect_answer (optional)	The answer to the problem. To supply a correct_answer value that includes letters, all letters **must be lowercase**. (Students' responses to the problem are not case sensitive. They can contain both uppercase and lowercase letters.)

Children

(none)

Tag: `<hintgroup>`

Attributes

At- tribute	Description
hintfn	Must be set to **hint_fn** (that is, the tag must appear as `<hintgroup hintfn="hint_fn"/>`).

7.31 Problem Written in LaTeX

> **Warning:** This problem type is a prototype, and is not supported. By default, the ability to create these problems is not enabled in Studio. You must change the advanced settings in your course before you can create problems with LaTeX. Use this problem type with caution.

If you have an problem that is already written in LaTeX, you can use this problem type to easily convert your code into XML. After you paste your code into the LaTeX editor, you'll only need to make a few minor adjustments.

Note: If you want to use LaTeX to typeset mathematical expressions in problems that you haven't yet written, use any of the other problem templates together with MathJax. For more information about how to create mathematical expressions in Studio using MathJax, see *A Brief Introduction to MathJax in Studio*.

Estimate the energy savings (in J/y) if all the people (3×10^8) in the U. S. switched from U. S. code to low flow shower heads.

Energy saved =

| 0.52 | ✔ |

| 0.52 |

Answer: 0.52

| Reset | Hide Answer(s) |

7.31.1 Create a Problem Written in LaTeX

To create a problem written in LaTeX:

1. Enable the policy key in your course.

   (a) In Studio, click **Settings**, and then click **Advanced Settings**.

   (b) In the field for the **Enable LaTeX Compiler** policy key, change **false** to **true**.

   (c) At the bottom of the page, click **Save Changes**.

2. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

3. Click **Problem Written in LaTeX**.

4. In the component editor that appears, click **Edit**.

5. In the lower left corner of the component editor, click **Launch LaTeX Source Compiler**.

6. Replace the example code with your own code. You can also upload a Latex file into the editor from your computer by clicking **Upload** in the bottom right corner.

7. In the lower left corner of the LaTeX source compiler, click **Save & Compile to edX XML**.

7.32 Protex Protein Builder Tool

The Protex protein builder asks students to create specified protein shapes by stringing together amino acids. In the example below, the goal protein shape is a simple line.

DESIGNING PROTEINS IN TWO DIMENSIONS (1 point possible)

The protein builder allows you string together the building blocks of proteins, amino acids, and see how that string will form into a structure. You are presented with a goal protein shape, and your task is to try to re-create it. In the example below, the shape that you are asked to form is a simple line.

Amino Acids

Amino Acid Sequence

Folded Protein

Target Shape

Fold   Disulfide Bonds OFF

Be sure to click "Fold" to fold your protein before you click "Check".

Check   Save   Show Answer(s)   You have used 1 of 10 submissions

7.32.1 Create the Protein Builder Tool

To create the protein builder:

1. Under **Add New Component**, click **Problem**, and then click **Blank Advanced Problem**.

2. In the component that appears, click **Edit**.

3. In the component editor, paste the Problem component code from below.

4. Make any changes that you want, and then click **Save**.

7.32.2 Protein Builder Tool Code

```
<problem>
    <p>The protein builder allows you string together the building blocks of proteins, amino acids, a
   <p>Be sure to click "Fold" to fold your protein before you click "Check".</p>

<script type="loncapa/python">
```

```
def protex_grader(expect,ans):
  import json
  ans=json.loads(ans)
  if "ERROR" in ans["protex_answer"]:
    raise ValueError("Protex did not understand your answer. Try folding the protein.")
  return ans["protex_answer"]=="CORRECT"

</script>

  <text>
    <customresponse cfn="protex_grader">
      <designprotein2dinput width="855" height="500" target_shape="W;W;W;W;W;W;W"/>
    </customresponse>
  </text>
  <solution>
    <p>
      Many protein sequences, such as the following example, fold to a straight line.You can play aro
    </p>
    <ul>
      <li>
          Stick: RRRRRRR
      </li>
    </ul>
  </solution>
</problem>
```

In this code:

- **width** and **height** specify the dimensions of the application, in pixels.

- **target_shape** lists the amino acids that, combined in the order specified, create the shape you've asked students to create. The list can only include the following letters, which correspond to the one-letter code for each amino acid. (This list appears in the upper-left corner of the protein builder.)

A	R	N	D
C	Q	E	G
H	I	L	K
M	F	P	S
T	W	Y	V

7.33 Qualtrics Survey Tool

You can administer Qualtrics surveys to your learners in your edX course. The Qualtrics survey appears in an IFrame in the courseware.

Course staff can view the overall results of the survey as well as responses from individual learners.

For more information, see the following sections.

- *Add a Qualtrics Survey to Your Course*
- *View Survey Responses*

7.33.1 Add a Qualtrics Survey to Your Course

To add a Qualtrics survey to your course, you must *create the survey in Qualtrics*, and then *create an HTML component in Studio*.

Create the Qualtrics Survey

Note: Because Qualtrics is a third-party tool, the following steps might change without notice. See the Qualtrics

website for the most up-to-date Qualtrics documentation.

1. Using your Qualtrics account, create your survey.

2. Add the statements and options that you want the survey to include.

3. Add the **user ID** element. This element imports data from your course into Qualtrics.

    (a) At the top of the page, make sure the **Edit Survey** tab is selected, and then select **Survey Flow**.

    (b) In the upper left corner, select **Add a New Element Here**.

    (c) Select **Embedded Data**.

    (d) Under **Set Embedded Data**, replace **Enter Embedded Data Field Name Here** with `uid`.

    (e) Select **Save Flow**.

4. At the top of the page, make sure **Edit Survey** is selected, and then select **Launch Survey**.

5. On the page that opens, select **Activate Survey** in the upper right corner.

6. On the page that opens, locate the URL that is listed under **Your Anonymous Survey Link**. You will add this URL to the HTML component for your survey in Studio.

Note: If you need to find this URL in the future, open your survey in Qualtrics, and then select the **Distribute Survey** tab at the top of the page.

Create the HTML Component in Studio

1. Open the unit where you want the survey to appear.

2. Under **Add New Component**, select **HTML**, and then select **IFrame Tool**.

3. Select **Edit** to open the component editor, and then select **HTML** in the menu bar.

4. At the end of the instructions, locate the example IFrame element, and replace the placeholder values with the values for your survey. The IFrame element starts with the following text.

   ```
   <iframe title="Euler Line Demo"
   ```

- In the `title` attribute, replace `Euler Line Demo` with the title of your survey.

- In the `src` attribute, replace the placeholder URL with the URL from step 6 in *Create the Qualtrics Survey*.

- In the `src` attribute, add the following value to the end of the URL.

   ```
   &uid=%%USER_ID%%
   ```

   The resulting `src` attribute resembles the following example.

   ```
   src="https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_9N27VuruRdNcpHT&uid=%%USER_ID%
   ```

- Replace the values in the `width` and `height` attributes with values that allow your survey to appear the way you want it to. For example, you might change `width` to 800 and `height` to 1000.

- (Optional) If your survey might be taller than the value that you set for `height`, in the `scrolling` attribute, change the value to `yes`. If you do not change the value to `yes` and your survey is taller than the `height` value, learners cannot scroll down to respond to all the survey statements.

- Leave the other default values, and then select **OK** at the bottom of the HTML source code editor to return to the component editor.

5. In the component editor, delete all of the default instructional text, or replace it with introductory text for your Qualtrics survey.

6. Select **Save**.

7.33.2 View Survey Responses

You can view both overall survey responses and responses for individual learners.

View Overall Responses

To view your overall survey results and analyze data, open your survey on the Qualtrics website.

View Survey Responses for an Individual Learner

To view a specific learner's survey responses, you must download data both from the Insructor Dashboard and from Qualtrics, and then review the data.

Download Data from the Instructor Dashboard

1. In the LMS, go to the Instructor Dashboard.

2. Select the **Data Download** page.

3. Under **Data Download**, select **Get Student Anonymized IDs CSV**. If you receive a prompt, specify the location where you want to save the file.

   The .csv file is saved to your computer. The file has the following name.

   ```
   <course name>_<course number>_<year>_<term>_anon-ids.csv
   ```

   For more information about anonymized student IDs, see *Accessing Anonymized Student IDs*.

4. Under **Reports**, select **Download profile information as a CSV**.

5. When the profile information report appears in the list under **Reports Available for Download**, select the report to download the .csv file to your computer. The file has the following name.

   ```
   <course name>_<course number>_<year>_<term>_student_profile_info_<date and
   time>.csv
   ```

For more information about accessing learner data, see *Student Data*.

Download Data from Qualtrics

Note: Because Qualtrics is a third-party tool, the following steps might change without notice. See the Qualtrics website for the most up-to-date Qualtrics documentation.

---

1. In Qualtrics, select the **View Results** tab.

2. On the page that opens, select **Download Data** in the upper left corner of the page.

3. On the page that opens, clear the **Compress the desired format into a .zip file before downloading** check box. Accept all the other default values.

4. Under **Format**, select the **This is a Comma Separated Values format...** link to download the .csv file.

Review the Data

To associate learners' responses with their learner profiles, open the three .csv files that you have downloaded in a program such as Microsoft Excel.

- The Qualtrics file has a **uid** column that contains each learner's anonymized ID, as well as columns that contain each learner's answers to the survey.

- The anonymized user ID file (`<course name>_<course number>_<year>_<term>_anon-ids.csv`) contains each learner's anonymized ID and the learner's edX user ID.

- The student profile data file (`<course name>_<course number>_<year>_<term>_student_profile_info_<date and time>.csv`) contains each learner's edX user ID and profile information, such as user name and real name.

To merge the data in the three spreadsheets so that you can see a learner's edX user ID, profile information, and survey responses in one place, you can use functions such as VLOOKUP in Microsoft Excel.

7.34 Randomized Content Blocks

If your course has *content libraries* enabled and you have access to a library whose content you want to use, you can reference that library to create randomized assignments for students.

To create a randomized assignment, you add one or more randomized content blocks to a course unit. For each randomized content block, specify a library from which to draw the content, and indicate the number and optionally the type of problem to randomly give each student.

The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page. For details about content libraries, see *Working with Content Libraries*.

For details about using content library components in a course, see these topics.

- *Use Components from Libraries in a Course*

- *Add a Randomized Content Block to Your Course*

- *View the Matching Components in a Randomized Content Block*

- *Editing Components in Randomized Content Blocks*

- *Getting the Latest Version of Library Content*

- *Preview the Randomized Content in Student View*

- *View a Specific Student's Assigned Problems from a Randomized Content Block*

- *Adjust Grades for a Problem from a Randomized Content Block*

7.34.1 Use Components from Libraries in a Course

To create randomized assignments that make use of components from content libraries, you must have at least **User** level access to the libraries that you want to use. If you do not have access to a library, members of your course team who have **Admin** access to that library can grant you access.

The libraries that you create or have access to are listed on the **Libraries** tab on the Studio Home page. For details about content libraries, see *Working with Content Libraries*.

Using components from content libraries in your course involves two steps.

1. *Enable Content Libraries*

2. *Add a Randomized Content Block to Your Course*

Note: After adding a randomized content block to your course, be aware that if components in the source library change, you must manually update the components in the course outline if you want to keep the components synchronized with the version in the library.

For details about working with randomized content blocks in your course, see these topics.

- *View the Matching Components in a Randomized Content Block*

- *Editing Components in Randomized Content Blocks*

- *Getting the Latest Version of Library Content*

- *Preview the Randomized Content in Student View*

- *View a Specific Student's Assigned Problems from a Randomized Content Block*

- *Adjust Grades for a Problem from a Randomized Content Block*

Enable Content Libraries

You must enable content libraries before you can use randomized components from *content libraries* in your courses.

1. In Studio, open the course in which you want to provide library content.

2. Select **Settings**, then **Advanced Settings**.

3. In the **Advanced Module List** field, place your cursor between the supplied pair of square brackets.

4. Type `"library_content"`.

5. Click **Save Changes**.

   Studio reformats the policy key you just entered to indent it on a new line.
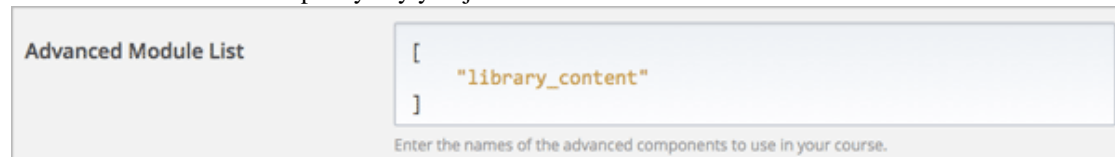
Add a Randomized Content Block to Your Course

After you *enable content libraries* you can add library content to your courses using the Randomized Content Block advanced component.

1. In Studio, open the course in which you want to add randomized problems from a content library.

2. Click **Content** then click **Outline**.

3. In the unit where you want to add a set of randomized problems, click **Add New Component**

4. Click **Advanced**, then click **Randomized Content Block**.

   The randomized content block is added to your unit.

5. Click the **Edit** icon.

6. In the randomized content block settings, specify the details of the content you want to add in this block.

- For **Count**, enter the number of problems to display to each student.

- For **Display Name**, enter the name that you want students to see for this block.

- For **Library**, select the library from which you want to draw problems.

- For **Problem Type**, from the drop down list select a specific type of problem to be drawn from the library. Select **Any Type** if you do not want to specify a particular type of problem.

- For **Scored**, from the drop down list select **True** or **False** to indicate whether the assignment should be graded.

Note: Grading is subject to the setting of this unit's subsection or section. If the subsection or section is not graded, selecting **True** here has no impact. Selecting **False** means that this assignment is not graded even if the subsection or section is graded.

---

7. Click **Save** when you have finished specifying the details of your randomized content block.

To view the list of components in the source library that match your filter settings, see *View the Matching Components in a Randomized Content Block*.

To view the entire contents of the library in Studio, see *View the Contents of a Library*.

7.34.2 View the Matching Components in a Randomized Content Block

In a unit that uses a randomized content block, you can view the list of all components that match the filters specified in that block.

For example, if you have specified in the randomized content block that you want to provide each student with 3 multiple choice problems, you see all the multiple choice problems that exist in the referenced library. In other words, you see every problem in the library that could potentially be provided to a student.

1. In Studio, navigate to the unit containing the randomized content block that references your library.

2. In the randomized content block, click the **View** icon.
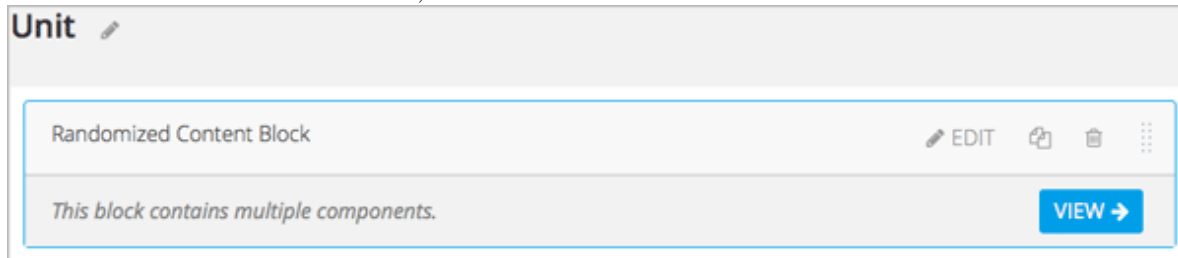
> You see all components that match the specifications in the randomized content block. The text at the top of the list of components indicates how many of these components are randomly selected and provided to each student.

To view the contents of a library in Studio, see *View the Contents of a Library*.

To view the randomized content that was assigned to a specific learner, see *Specific Student View*.

7.34.3 Editing Components in Randomized Content Blocks

In Studio, in the course unit that uses a randomized content block, you can edit each component within the randomized content block in the same way as you do for any other component in your course.

Note: Be aware that if you make changes on a component's **Editor** tab, if you update the randomized content block with the latest version of components from a library, these changes are overwritten. Only changes to a component's **Settings** tab are retained when you update the component. For details about getting the latest versions of library content in a randomized content block, see *Getting the Latest Version of Library Content*.

The settings of a component that is supplied in a randomized content block are initially inherited from the component in the content library that it is drawn from. In the randomized content block, you can modify component settings so that they are different from the "source" component in the library.

You can also reset a component's settings to the library default. If a component's settings have been changed from the default settings in the library, a **Clear** icon is shown next to the setting field.
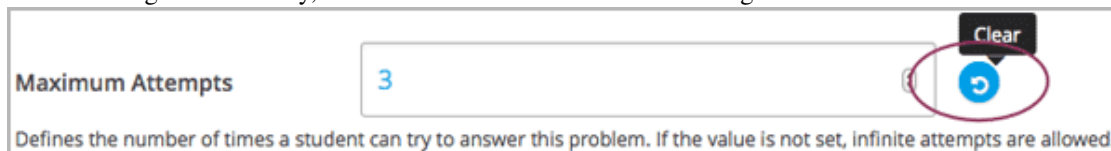
Click the **Clear** icon to restore the library default setting for that field.

7.34.4 Getting the Latest Version of Library Content

If you modify the contents of a library that is referenced by randomized content blocks in one or more courses, those courses do not automatically use the updated content. You can bring the randomized content blocks up to date with the version in the library.

> **Warning:** Be careful when you modify problems after they have been released. Changes that you make to published problems can affect the student experience in the course, as well as analysis of course data.

Note: Be aware that although you can retain changes to the settings of components in a randomized content block, changes to the **Editor** tab in components are overwritten if you update the component to the latest library version. If you do not want to bring components in the randomized content block up to date with the latest version in the library, you do not need to take any action.

- If the components in the randomized content block have not been edited in the course outline, when you next open the randomized content block in the course outline, you see a message indicating that the component is out of date in comparison with the library.
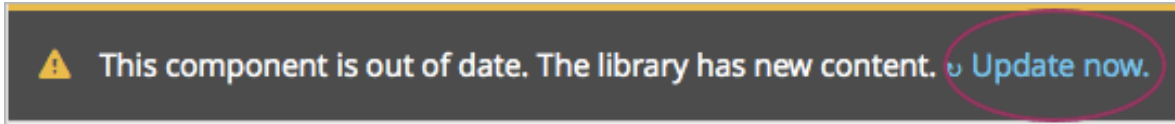
  To update your randomized content block components to the latest versions in the content library, click **Update now**.

  The randomized content block is brought up to date with the latest contents of the library that it references.

- If you edited only the settings of components in the randomized content block in your course so that they are different from the original version in the library, you do not lose your changes if you click **Update now**. In this case, the changes that were made in the randomized content block in the course outline are kept, but a **Clear** button becomes available next to the changed field in the component. However, any changes you made to the **Editor** tab of components in a randomized content block will be lost if you click **Update now** to get the latest library version.
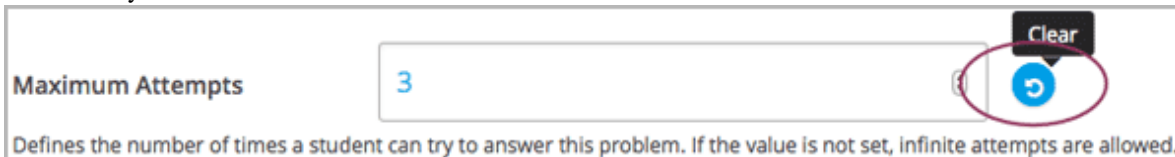
  To clear any edits made in the course outline and bring your edited components up to date with the version in the library, click **Clear**.

  The value in that component field is reset to the current value in the library.

7.34.5 Preview the Randomized Content in Student View

You can preview course content before a course is live or before you publish specific units, to test how content will appear to students when it is released. To view the number and type of components from a randomized content block as students would see them, follow the steps described in the *Preview a Unit* topic.

7.34.6 View a Specific Student's Assigned Problems from a Randomized Content Block

In a live course, to view the components that are assigned to a specific student from a randomized content block, follow the steps described in the *Specific Student View* topic.

7.34.7 Adjust Grades for a Problem from a Randomized Content Block

To adjust a grade or reset the attempts for a problem that was assigned from a randomized content block, you can view the courseware as a specific student to see the actual problems that they were assigned.

Obtain the username or email address for the learner whose grades you want to adjust, and follow the steps described in the *Specific Student View* topic to view the actual problems in the courseware that this student was assigned.

In the **Specific student** courseware view in the LMS for the student whose username or email you entered, locate the components from the randomized content block. Follow the steps described in *Adjust Grades* to rescore the learner's submission, reset attempts, or delete the learner's state for a problem.

7.35 Recommender

The Recommender provides students with a list of online resources related to the course content. These resources are jointly managed by course team members and the students.

The most common use is for remediation of errors and misconceptions, followed by providing additional, more advanced resources.

For example, if a student is working through a physics problem, the Recommender may show links to concepts used in the problem on Wikipedia, PhET, and OpenStax, as well as in the course itself. The Recommender can help fill complex knowledge gaps, as well as help to move students in the right direction.

- Students and course team members can:
  - Add new resources.
  - Edit existing resources and work jointly to improve the quality of resources (e.g., give an informative resource summary).
  - Manage quality by voting for high quality resources or flagging resources as spam or abuse.

Course team members can endorse useful resources or remove irrelevant entries.

If you use the Recommender, you should inform students through course content or *course updates* about the tool.

Following is an example of a Recommender in a course. The upper part of the figure illustrates a question in problem set where the Recommender is attached. The middle of the figure shows a list of resources and several gadgets for users to work on the resources. The bottom portion shows additional information about a given resource on mouse-over event.

7.35.1 Add a Recommender

To add a Recommender to a course:

1. Add the Recommender advanced component.

   (a) On the **Settings** menu, click **Advanced Settings**.

   #. Make sure that **recommender** is in the field for the **Advanced Module List** policy key. For example, if you have no other advanced module, this field should be:

   ```
   ["recommender"]
   ```

   (a) At the bottom of the page, click **Save Changes**.

   The page refreshes automatically. At the top of the page, you should see a notification that your changes have been saved.

   (b) Go to the unit in the course outline where you want to add the RecommenderXBlock.

2. Under **Add New Component**, select **Advanced**.

3. Select **recommender**.

4. Optionally, in the component that appears, select **Edit**. Then, in the component editor, specify settings as needed.

   - Whether to take users on an introduction tour when they see the tool the first time. If selected, the first time (and only the first time) a user sees the RecommenderXBlock, there will be a short guided tutorial.

   - Whether to disable the user interface functions which are under development. Because these are untested and under development, please leave these disabled unless otherwise advised by edX staff.

   - How many resources do you want to show in each page of the resource list.

   - How many page icons do you want to show in the pagination control (that is, the page range)? The icons for pages from (current page - page range) to (current page + page range) will be shown.

5. Click **Save**.

6. Optionally, open the unit in the LMS and suggest some resources.

7.36 Survey Tool

This section describes how to include surveys in your course.

- *Overview*
- *Enable the Survey Tool*
- *Add a Survey in edX Studio*
- *Add a Survey in OLX*
- *Editing Published Surveys*
- *View Survey Results*

7.36.1 Overview

You can include surveys in your course to collect learner responses to multiple questions.

For a survey, you configure multiple question and multiple possible answers. The set of answers is used for each question in the survey. If you need to ask only one question, use the *Poll Tool*.

The following example survey has three questions, each with the same three possible answers.

After learners submit their answers to the survey, they see the survey results that have been gathered at this time, unless the survey has been configured to hide results.

7.36.2 Enable the Survey Tool

Before you can add surveys to your course, you must enable the survey tool in Studio or OLX.

Enable the Survey Tool in Studio

1. From the **Settings** menu, select **Advanced Settings**.

2. In the **Advanced Module List** field, place your cursor between the supplied pair of square brackets, and then type `"survey"`. If you see other values in this field, add a comma after the closing quotation mark for the last value, and then type `"survey"`.
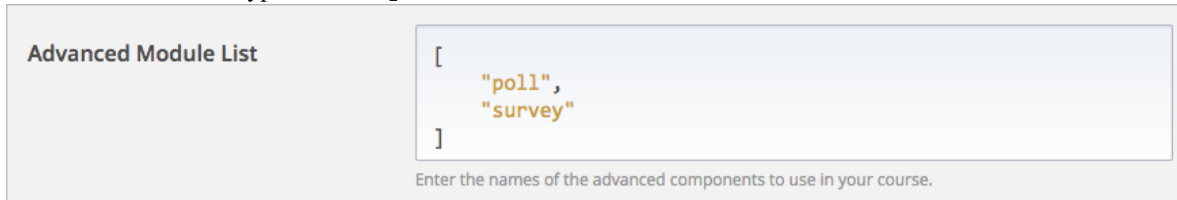
3. Select **Save Changes**.

Studio reformats the policy key you just entered to indent it on a new line.

Enable the Survey Tool in OLX

To enable enable the survey tool, you edit the XML file that defines the course structure.

Open the XML file for the course in the `course` directory. In the `course` element's `advanced-modules` attribute, add the string `survey`.

For example, the following XML code enables the survey tool.
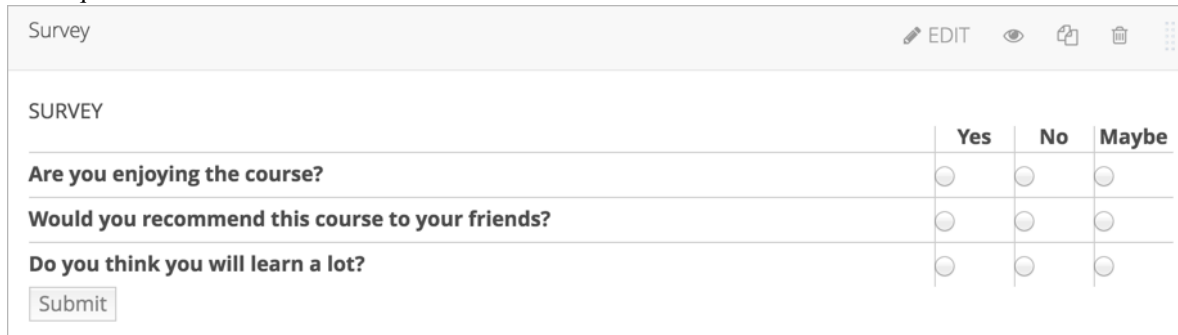
```
<course advanced_modules="[&quot;survey&quot;,
    &quot;poll&quot;]" display_name="Sample Course"
    start="2015-01-01T00:00:00Z">
    ...
</course>
```

7.36.3 Add a Survey in edX Studio

You must *enable the survey tool* before you add the component.

1. On the Course Outline page, open the unit where you want to add the survey.

2. Under **Add New Component** click **Advanced**, and then select **Survey**.

   The new component is added to the unit, with the default survey that contains three answer fields and three questions.

3. In the new component, select **Edit**.

4. In the **Display Name** field, enter the name for the component.

5. In the **Feedback** field, enter text that learners see after they submit responses.

6. In the **Private Results** field, to hide survey results from learners, select **True**. If you leave the default value, **False**, learners see survey results after they submit responses.

7. In the **Maximum Submissions** field, to allow learners to submit responses more than once, change the value. Enter **0** to allow unlimited responses.

   Note: If you allow learners to submit responses more than once, you should set **Private Results** to **True**. Otherwise, learners will be able to change their responses after seeing others' responses.

   ---

8. Configure answers for the survey. Each answer is displayed to learners as a column, with a radio button they can select. Each answer is used for each survey question.

   (a) In each **Answer** field, enter the text for the column heading that learners will see.

   (b) To add answers, select **Add answer** at the bottom of the editor. New answers are added at the bottom of the list.

   (c) The top answer in the list is displayed to learners as the left-most answer column in the survey, and the bottom answer is displayed in the right-most column. To change the order of answers, select the up and down buttons next to each answer.

   (d) To remove an answer, select **Delete** next to the answer.

9. Configure questions for the survey. Each question is displayed to learners in the left-most column.

   (a) You must enter either text or an image path, or both, for each question. To enter an image, use the *Studio URL* for the image.

   (b) The survey template contains three questions. To add questions, select **Add question** at the bottom of the editor. New questions are added at the bottom of the list.

   (c) If you use an image, you must enter useful alternative text in the **Image alternate text** field for non-sighted users.

   (d) Questions are displayed to learners as rows in the order you configure them. To change the order of questions, select the up and down buttons next to each question.

   (e) To remove a question, select **Delete** next to the question.

10. Select **Save**.

7.36.4 Add a Survey in OLX

To add a survey XBlock in OLX, you create the `survey` element. You can embed the `survey` element in the `vertical` element, or you can create the `survey` element as a stand-alone file that you reference in the vertical.

The following example shows the OLX definition for a survey with two questions.

```
<survey
  url_name="unique identfier for the survey"
  xblock-family="xblock.v1"
  questions="[
              [&quot;unique code for question 1&quot;,
                {
                  &quot;img&quot;: &quot;Static URL to image&quot;,
                  &quot;img_alt&quot;: &quot;Alternative text for image&quot;,
                  &quot;label&quot;: &quot;Text of question 1&quot;
                }
              ],
              [&quot;unique code for question 2&quot;,
                {
                  &quot;img&quot;: &quot;Static URL to image&quot;,
                  &quot;img_alt&quot;: &quot;Alternative text for image&quot;,
                  &quot;label&quot;: &quot;Text of question 2&quot;
                }
              ]
            ]"
  feedback="Feedback displayed to learner after submission"
  private_results="false"
  block_name="Display name for survey"
  max_submissions="1"
  answers="[
            [
              &quot;Unique identifier for answer 1&quot;,
              &quot;Answer text&quot;
            ],
            [
              &quot;Unique identifier for answer 2&quot;,
              &quot;Answer text&quot;
            ]
          ]"
/>
```

survey Element Attributes

The following table describes the attribute of the `survey` element.

Attribute	Description
`url_name`	The unique identifier of the survey.
`xblock-family`	The XBlock version used. Must be `xblock.v1`.
`questions`	An array of questions in the survey. Each question has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the question image. • `img_alt`, the alternative text for the image. • `label`, the question text. Each question must have a value for `img` or `label`, or both.
`answers`	An array of answers in the survey. Each answer has a unique identifier, and a dictionary that defines values for the following names. • `img`, the static URL of the answer image. • `img_alt`, the alternative text for the image. • `label`, the answer text. Each answer must have a value for `img` or `label`, or both.
`feedback`	The text shown to learners after they submit a response.
`private_results`	Whether the survey results are shown to learners (`true`) or not (`false`).
`block_name`	The display name for the survey.
`max_submissions`	The number of times a learner can submit survey answers. Use `0` to allow unlimited submissions. If you use a value other than `1`, set `private_results` to `true`. Otherwise, learners will be able to change their responses after seeing others' responses.

7.36.5 Editing Published Surveys

Do not publish a survey until you have completed and tested it. You should avoid changing a survey after learners have begun using it.

If you must edit a survey after learners have submitted answers, take into account the following implications.

- If you edit the value of a question or answer, previous submissions are associated with the new question or answer value. This change can result in an inaccurate picture of the responses.

- If you change the survey so that previous submissions are invalid, by removing a question or answer, those submissions are deleted when learners next view the unit. Learners with invalid submissions are permitted to submit new responses.

7.36.6 View Survey Results

When you view the survey as a course staff member, you can view results of the survey in the courseware.

Select **View results** in the survey.

The results of the survey are then displayed.

7.37 Text Input Problem

- *Overview*
- *Analyzing Performance on Multiple Choice Problems*
- *Creating a Text Input Problem*
- *Use Feedback in a Text Input Problem*
- *Use Hints in a Text Input Problem*
- *Multiple Responses in Text Input Problems*
- *Case Sensitivity and Text Input Problems*
- *Response Field Length of Text Input Problems*
- *Regular Expressions in Text Input Problems*
- *Text Input Problem XML*
- *Deprecated Hinting Method*

7.37.1 Overview

In text input problems, learners enter text into a response field. The response can include numbers, letters, and special characters such as punctuation marks. Because the text that the learner enters must match the instructor's specified answer exactly, including spelling and punctuation, we recommend that you specify more than one correct answer for text input problems to allow for differences in capitalization and typographical errors.

7.37.2 Analyzing Performance on Multiple Choice Problems

For the text input problems in your course, you can use edX Insights to review aggregated learner performance data and examine submitted answers. For more information, see Using edX Insights.

7.37.3 Creating a Text Input Problem

You can create text input problems in the Simple Editor or in the Advanced Editor. You can set up a problem in the Simple Editor, and then switch to the Advanced Editor to add more configuration options in XML. However, you cannot switch back to the Simple Editor from the Advanced Editor. Therefore, you might want to format the problem as completely as possible before you begin to use the Advanced Editor.

Use the Simple Editor to Create a Text Input Problem

To use the *Simple Editor* to create a text input problem, follow these steps.

1. In the unit where you want to create the problem, under **Add New Component** select **Problem**.

2. Select one of the two text input problem templates.

   • From the list of **Common Problem Types**, select **Text Input**.

   • From the list of **Common Problems with Hints and Feedback**, select **Text Input with Hints and Feedback**. For more information, see *Use Feedback in a Text Input Problem*.

   Studio adds the problem to the unit.

3. Select **Edit**. The Simple Editor opens.

4. Replace the sample problem text with your own text.

5. Determine the text that describes the question you want learners to answer, and surround that text with two pairs of angle brackets (>>question<<). This question text is the accessible label for the problem.

6. Select the text of the problem's answer, and then select **Text Input** from the toolbar. An equals signe (=) appears next to the answer.

You can identfy more than one correct answer. For more information, see *Multiple Responses in Text Input Problems*.

7. To provide an explanation, select the explanation text and then select **Explanation** from the toolbar. [explanation] appears before and after the explanation text.

8. Select **Settings** and provide an identifying **Display Name** for the problem.

9. Define additional settings for the problem. For more information, see *Problem Settings*.

10. Select **Save**.

For the example problem illustrated above, the following text displays in the problem component.

```
>>What was the first post-secondary school in China to allow both male and
female students?<<

= Nanjing Higher Normal Institute
or= National Central University
or= Nanjing University

[explanation]
Nanjing Higher Normal Institute first admitted female students in 1920.
[explanation]
```

Use the Advanced Editor to Edit a Text Input Problem

To use the Advanced Editor to edit a text input problem, follow these steps.

1. Follow the steps for creating the problem in the *Simple Editor*.

2. Select **Advanced Editor**, and then edit the XML to add the tags and attributes you want. An example follows.

Problem Code:

```
<problem>
  <p>What was the first post-secondary school in China to allow both male and female students?</p>

  <stringresponse answer="Nanjing Higher Normal Institute" type="ci" >
    <additional_answer>National Central University</additional_answer>
    <additional_answer>Nanjing University</additional_answer>
    <textline label="What was the first post-secondary school in China to
      allow both male and female students?" size="20"/>
  </stringresponse>
  <solution>
    <div class="detailed-solution">
      <p>Explanation</p>
      <p>Nanjing Higher Normal Institute first admitted female students in
      1920.</p>
    </div>
  </solution>
</problem>
```

7.37.4 Use Feedback in a Text Input Problem

You can add feedback in a text input problem using the simple editor or the advanced editor. For an overview of feedback in problems, see *Adding Feedback and Hints to a Problem*.

In text input problems, you can provide feedback for each option that a learner can select.

Use feedback on correct answers to reinforce why the answer is correct.

Use feedback on incorrect answers as an opportunity to address common learner misconceptions. Feedback for text input questions should also provide guidance to the learner on how to arrive at the correct answer.

Configure Feedback in the Simple Editor

In the *Simple Editor*, you configure answer feedback with the following syntax. When you create a new text input problem, select the template **Text Input with Hints and Feedback**. This template has example feedback syntax that you can replace.

```
= Correct Answer {{Feedback for learners who select this answer.}}
not= Incorrect Answer {{Feedback for learners who select this answer.}}
```

For example, the following problem has feedback for the correct answer and two common incorrect answers.

```
>>What is the largest state in the U.S. in terms of land area?<<

=Alaska {{Alaska is the largest state in the U.S. in terms of not only land
area, but also total area and water area. Alaska is 576,400 square miles,
more than double the land area of the second largest state, Texas.}}

not=Texas {{While many people think Texas is the largest state in terms of
land area, it is actually the second largest and contains 261,797 square
miles.}}

not=California {{California is the third largest state and contains 155,959
square miles.}}
```

Configure Feedback in the Advanced Editor

In the *Advanced Editor*, you configure answer feedback with the following syntax.

```
<stringresponse answer="Correct Answer" type="ci" >
  <correcthint>Hint for correct answer.</correcthint>
  <stringequalhint answer="Incorrect Anser">
    Hint for incorrect answer.
  </stringequalhint>
</stringresponse>
```

For example, the following problem has feedback for the correct answer and two common incorrect answers.

```
<problem>

  <p>What was the first post-secondary school in China to allow both male and female students?</p>
  <stringresponse answer="Alaska" type="ci" >
    <correcthint>
      Alaska is the largest state in the U.S. in terms of not only land
      area, but also total area and water area. Alaska is 576,400 square
      miles, more than double the land area of the second largest state,
      Texas.
    </correcthint>
    <stringequalhint answer="Texas">
      While many people think Texas is the largest state in terms of land
      area, it is actually the second largest of the 50 U.S. states
      containing 261,797 square miles.
    </stringequalhint>
```

```
    <stringequalhint answer="California">
      California is the third largest state in the U.S. in terms of land
      area containing 155,959 square miles.</stringequalhint>
    <textline label="What is the largest state in the U.S. in terms of land
      area?" size="20"/>
  </stringresponse>
</problem>
```

Customize Feedback Labels

By default, the feedback labels shown to learners are **Correct** and **Incorrect**. If you do not define feedback labels, learners see these terms when they submit an answer, as in the following example.

TEXT INPUT WITH HINTS AND FEEDBACK (1 point possible)

What is the largest state in the U.S. in terms of land area?

Texas ✖

Incorrect:
While many people think Texas is the largest state in terms of land area, it is actually the second largest of the 50 U.S. states containing 261,797 square miles.

Check

You can configure the problem to override the default labels. For example, you can configure a custom label for a specific wrong answer.

TEXT INPUT WITH HINTS AND FEEDBACK (1 point possible)

What is the largest state in the U.S. in terms of land area?

Texas ✖

Close but wrong:
While many people think Texas is the largest state in terms of land area, it is actually the second largest of the 50 U.S. states containing 261,797 square miles.

Check

Note: The default labels **Correct** and **Incorrect** are displayed in the learner's requested language. If you provide custom labels, they are displayed to all users as you configure them and are not translated into different languages.

Customize Feedback Labels in the Simple Editor

In the *Simple Editor*, you configure custom feedback labels with the following syntax.

```
not=Answer {{Label:: Feedback}}
```

For example, the following feedback is configured to use a custom label.

```
not=Texas {{Close but wrong:: While many people think Texas is the largest
state in terms of land area, it is actually the second largest of the 50 U.S.
states, containing 261,797 square miles.}}
```

Customize Feedback Labels in the Advanced Editor

In the *Advanced Editor*, you configure custom feedback labels with the following syntax.

```
<stringequalhint answer="Incorrect Anser" label="Custom Label">
  Feedback
</stringequalhint>
```

For example, the following feedback is configured to use a custom label.

```
<stringequalhint answer="Texas" label="Close but wrong">
  While many people think Texas is the largest state in terms of land
  area, it is actually the second largest of the 50 U.S. states containing
  261,797 square miles.
</stringequalhint>
```

7.37.5 Use Hints in a Text Input Problem

You can add hints in a text input problem, using the simple editor or the advanced editor. For an overview of hints in problems, see *Adding Feedback and Hints to a Problem*.

Configure Hints in the Simple Editor

In the simple editor, you configure hints with the following syntax.

```
||Hint 1||
||Hint 2||
||Hint n||
```

Note: You can configure any number of hints. The learner views one hint at a time and views the next one by selecting **Hint** again.

For example, the following problem has two hints.

```
||A fruit is the fertilized ovary from a flower.||
||A fruit contains seeds of the plant.||
```

Configure Hints in the Advanced Editor

In the advanced editor, you configure each hint in the `<hint>` element within the `<demandhint>` element.

```
<demandhint>
  <hint>Hint 1</hint>
  <hint>Hint 2</hint>
  <hint>Hint 3</hint>
</demandhint>
```

For example, the following XML shows two hints.

```
<demandhint>
  <hint>A fruit is the fertilized ovary from a flower.</hint>
  <hint>A fruit contains seeds of the plant.</hint>
</demandhint>
```

7.37.6 Multiple Responses in Text Input Problems

You can specify more than one correct response for text input problems. For example, instead of requiring learners to enter "Dr. Martin Luther King, Junior" exactly, you can also allow answers of "Martin Luther King," "Doctor Martin Luther King," and other variations. To do this, you can use the Simple Editor or the Advanced Editor.

Simple Editor

To specify additional correct responses in the Simple Editor, include ''or= '' before each additional correct response.

```
>>What African-American led the United States civil rights movement during
the 1960s?<<
= Dr. Martin Luther King, Jr.
or= Dr. Martin Luther King, Junior
or= Martin Luther King, Jr.
or= Martin Luther King
```

Advanced Editor

To specify additional correct responses in the Advanced Editor, add an `<additional_answer>` for each correct response inside the opening and closing `<stringresponse>` tags.

```
<problem>

<p>What African-American led the United States civil rights movement during the 1960s?</p>

<stringresponse answer="Dr. Martin Luther King, Jr." type="ci" >
  <additional_answer>Dr. Martin Luther King, Junior</additional_answer>
  <additional_answer>Martin Luther King, Jr.</additional_answer>
  <additional_answer>Martin Luther King</additional_answer>
  <textline label="What African-American led the United States civil rights
    movement during the 1960s?" size="20"/>
</stringresponse>
</problem>
```

7.37.7 Case Sensitivity and Text Input Problems

By default, text input problems do not require a case sensitive response. You can change this and require a case sensitive answer.

To make a text input response case sensitive, you must use *The Advanced Editor*.

In the Advanced Editor, you see that the `type` attribute of the `stringresponse` element equals `ci`, for "case insensitive". An example follows.

```
<stringresponse answer="Michigan" type="ci">
  <textline size="20"/>
</stringresponse>
```

To make the response case sensitive, change the value of the `type` attribute to `cs`.

```
<stringresponse answer="Michigan" type="cs">
  <textline size="20"/>
</stringresponse>
```

7.37.8 Response Field Length of Text Input Problems

By default, the response field for text input problems is 20 characters long.

You should preview the unit to ensure that the length of the response input field accommodates the correct answer, and provides extra space for possible incorrect answers.

If the default response field length is not sufficient, you can change it using *The Advanced Editor*.

In the Advanced Editor, in the XML block for the answer, you see that the `size` attribute of the `textline` element equals `20`.

```
<stringresponse answer="Democratic Republic of the Congo" type="ci">
  <textline size="20"/>
</stringresponse>
```

To change the response field length, change the value of the `size` attribute.

```
<stringresponse answer="Democratic Republic of the Congo" type="ci">
  <textline size="40"/>
</stringresponse>
```

7.37.9 Regular Expressions in Text Input Problems

You can configure a text input problem to allow a regular expression as an answer. To do this, you modify the problem's XML in the Advanced Editor.

The regular expression that the learner enters must contain the part of the answer that the course team specifies. For example, if you specify `<answer="example answer" type="regexp">`, correct answers include `example answered`, `two example answers`, or even `==example answer==`, but not `examples` or `example anser`.

You can add `regexp` to the value of the `type` attribute, for example: `type="ci regexp"` or `type="regexp"` or `type="regexp cs"`. In this case, any answers or hints are treated as regular expressions.

7.37.10 Text Input Problem XML

Template

```
<problem>
    <p>Problem text</p>
    <stringresponse answer="Correct answer 1" type="ci regexp">
        <additional_answer>Correct answer 2</additional_answer>
        <additional_answer>Correct answer 3</additional_answer>
        <textline size="20" label="label text"/>
```

```
        <correcthint>Provides feedback when learners submit the correct response.</correcthint>
        <stringequalhint answer="Incorrect answer 1">Provides feedback when learners submit the spec
        <stringequalhint answer="Incorrect answer 2">Provides feedback when learners submit the spec
        <textline label="Which U.S. state has the largest land area?" size="20"/>
    </stringresponse>

    <demandhint>
      <hint>The first text string to display when learners request a hint.</hint>
      <hint>The second text string to display when learners request a hint.</hint>
    </demandhint>
</problem>
```

Tags

- `<stringresponse>`: Indicates that the problem is a text input problem. The `<stringresponse>` tag has the following child tags.

  - `<textline>`: Creates the response field in the LMS where the learner enters a response.

  - `<additional_answer>` (optional): Specifies an additional correct answer for the problem. A problem can contain an unlimited number of additional answers.

  - `<correcthint>` (optional): Specifies feedback for the correct answer.

  - `<stringequalhint>` (optional): Specifies feedback for an incorrect answer.

- `<demandhint>` (optional): Specifies one or more hints that learners can request to help them arrive at the correct answer. The `<demandhint>` tag has a child tag of `<hint>`.

Tag: `<stringresponse>`

Indicates that the problem is a text input problem.

Attributes

Attribute	Description
answer (required)	Specifies the correct answer. To designate the answer as a regular expression, add "regexp" to the **type** attribute. If you do not add "regexp" to the **type** attribute, the learner's answer must match the value in this attribute exactly.
type (optional)	Specifies whether the problem requires a case sensitive response and if it allows regular expressions. • If the `<stringresponse>` tag includes `type="ci"`, the problem is not case sensitive. • If the tag includes `type="cs"`, the problem is case sensitive. • If the tag includes `type="regexp"`, the problem allows regular expressions. A **type** attribute in a `<stringresponse>` tag can also combine these values. For example, `<stringresponse type="regexp cs">` specifies that the prolem allows regular expressions and is case sensitive.

Children

- `<textline />` (required)

- `<additional_answer>` (optional)

- `<correcthint>` (optional)

- `<stringequalhint>` (optional)

Tag: `<textline />`

Creates a response field in the LMS where the learner enters a response.

Attributes

Attribute	Description
label (required)	Contains the text of the problem.
size (optional)	Specifies the size, in characters, of the response field in the LMS.
hidden (optional)	If set to "true", learners cannot see the response field.
correct_answer (optional)	Lists the correct answer to the problem.

Children

(none)

Tag: `<additional_answer>`

Specifies an additional correct answer for the problem. A problem can contain an unlimited number of additional answers.

Attributes

(none)

Children

(none)

Tag: `<correcthint>`

Indicates that the course team has provided hints for certain common incorrect answers.

Attributes

(none)

Children

(none)

Tag: `<stringequalhint>`

Specifies the feedback for an incorrect answer.

Attributes

Attribute	Description
answer (required)	The text of the incorrect answer.

Children

(none)

Tag: `<demandhint>`

Specifies one or more hints that learners can request to help them arrive at the correct answer.

Attributes

(none)

Children

Tag: `<hint>`

Contains the text of a hint. The LMS shows each of the defined hints to the learners in the order that the `<hint>` tags are included within the `<demandhint>` tag.

7.37.11 Deprecated Hinting Method

The following example shows the XML format with the `<hintgroup>` element that you could use to configure hints for text input problems. Problems using this XML format will continue to work in the edX Platform. However, it is recommended that use use the new way of configuring hints documented above.

```xml
<problem>
    <p>Problem text</p>
    <stringresponse answer="Correct answer 1" type="ci regexp">
        <additional_answer>Correct answer 2</additional_answer>
        <additional_answer>Correct answer 3</additional_answer>
        <textline size="20" label="label text"/>
        <hintgroup>
            <stringhint answer="Incorrect answer A" type="ci" name="hintA" />
              <hintpart on="hintA">
                  <startouttext />Text of hint for incorrect answer A<endouttext />
              </hintpart >
            <stringhint answer="Incorrect answer B" type="ci" name="hintB" />
              <hintpart on="hintB">
                  <startouttext />Text of hint for incorrect answer B<endouttext />
              </hintpart >
            <stringhint answer="Incorrect answer C" type="ci" name="hintC" />
              <hintpart on="hintC">
                  <startouttext />Text of hint for incorrect answer C<endouttext />
              </hintpart >
        </hintgroup>
    </stringresponse>
    <solution>
    <div class="detailed-solution">
    <p>Explanation or Solution Header</p>
    <p>Explanation or solution text</p>
    </div>
  </solution>
</problem>
```

7.38 Word Cloud Tool

In a word cloud tool, students enter words into a field in response to a question or prompt. The words all the students have entered then appear instantly as a colorful graphic, with the most popular responses appearing largest. The graphic becomes larger as more students answer. Students can both see the way their peers have answered and contribute their thoughts to the group.

For example, the following word cloud was created from students' responses to a question in a HarvardX course.

This exercise first appeared in HarvardX's PH278x: Human Health and Global Environmental Change course, spring 2013.

7.38.1 Create a Word Cloud Tool

To create a word cloud tool:

1. Add the Word Cloud advanced component.

    (a) On the **Settings** menu, click **Advanced Settings**.

    (b) In the field for the **Advanced Module List** policy key, place your cursor between the brackets.

    (c) Enter the following value. Make sure to include the quotation marks.

    ```
    "word_cloud"
    ```

    (a) At the bottom of the page, click **Save Changes**.

    The page refreshes automatically. At the top of the page, you see a notification that your changes have been saved.

    (b) Return to the unit where you want to add the specialized problem. The list of possible components now contains an Advanced component.

4. In the unit where you want to create the problem, click **Advanced** under **Add New Component**.

5. In the list of problem types, click **Word Cloud**.

6. In the component that appears, click **Edit**.

7. In the component editor, specify the settings that you want. You can leave the default value for everything except **Display Name**.

   - **Display Name**: This name appears as a heading above the problem and as a tooltip in the learning sequence at the top of the **Courseware** page.

   - **Inputs**: The number of text boxes into which students can enter words, phrases, or sentences.

   - **Maximum Words**: The maximum number of words that the word cloud displays. If students enter 300 different words but the maximum is set to 250, only the 250 most commonly entered words appear in the word cloud.

   - **Show Percents**: The number of times that students have entered a given word as a percentage of all words entered appears near that word.

8. Click **Save**.

7.39 Write-Your-Own-Grader Problem

This chapter provides information about writing your own grader directly in a problem component. See the following sections for more information.

- *Overview*
- *Create a Custom Python-Evaluated Input Problem Studio*
- *Script Tag Format*
- *Answer Tag Format*
- *Providing Partial Credit for Custom Python-Evaluated Input Problems*
- *Create a Randomized Custom Python-Evaluated Input Problem*

7.39.1 Overview

In custom Python-evaluated input (also called "write-your-own-grader" problems), the grader uses a Python script that you create and embed in the problem to evaluate a learner's response or provide hints. These problems can be any type. Numerical input and text input problems are the most common write-your-own-grader problems.

You can create a Python-evaluated input problem in *answer tag format* or *script tag format*.

Custom Python-evaluated input problems can include the following:

- *Chemical Equation Problem*
- *Custom JavaScript Problem*
- *Gene Explorer Tool*
- *Molecule Editor Tool*
- *Protex Protein Builder Tool*

7.39.2 Create a Custom Python-Evaluated Input Problem Studio

1. In the unit where you want to create the problem, click **Problem** under **Add New Component**, and then click the **Advanced** tab.

2. Click **Custom Python-Evaluated Input**.

3. In the component that appears, click **Edit**.

4. In the component editor, edit the problem in *answer tag format* or *script tag format*.

5. Click **Save**.

7.39.3 Script Tag Format

The script tag format encloses a Python script that contains a "check function" in a `<script>` tag, and adds the `cfn` attribute of the `<customresponse>` tag to reference that function. In the following example, `<customresponse>` tags reference the `test_add_to_ten` and `test_add` functions that are in the `<script>` tag.

```
<problem>

<script type="loncapa/python">

def test_add(expect, ans):
    try:
        a1=int(ans[0])
        a2=int(ans[1])
        return (a1+a2) == int(expect)
    except ValueError:
        return False

def test_add_to_ten(expect, ans):
    return test_add(10, ans)

</script>

<p>Enter two integers that sum to 10. </p>
<customresponse cfn="test_add_to_ten">
  <textline size="10"/><br/>
  <textline size="10"/>
</customresponse>

<p>Enter two integers that sum to 20: </p>
<customresponse cfn="test_add" expect="20">
  <textline size="40" correct_answer="11" label="Integer #1"/><br/>
  <textline size="40" correct_answer="9" label="Integer #2"/>
</customresponse>

<solution>
  <div class="detailed-solution">
    <p>Explanation</p>
    <p>Any set of integers on the line \(y = 10 - x\) and \(y = 20 - x\)
      satisfies these constraints.</p>
    <p>You can also add images within the solution clause, like so:</p>
    <img src="/static/images/placeholder-image.png"/>
  </div>
</solution>
```

```
</problem>
```

Important: Python honors indentation. Within the `<script>` tag, the `def check_func(expect, ans):` line must have no indentation.

The following table explains the important attributes and values in the preceding example.

`<script type="loncapa/python">`	Indicates that the problem contains a Python script.
`<customresponse cfn="test_add_to_ten">`	Indicates that the function `test_add_to_ten` is called when the student checks the answers for this problem.
`<customresponse cfn="test_add" expect="20">`	Indicates that the function `test_add` is called when the student checks the answers for this problem and that the expected answer is `20`.
`<textline size="10" correct_answer="3"/>`	This tag includes the `size`, `correct_answer`, and `label` attributes. The `correct_answer` attribute is optional.

The **check** function accepts two arguments:

- `expect` is the value of the `expect` attribute of `<customresponse>`. If `expect` is not provided as an argument, the function must have another way to determine if the answer is correct.

- `answer` is either:

  - The value of the answer the student provided, if the problem only has one response field.

  - An ordered list of answers the student provided, if the problem has multiple response fields.

The **check** function can return any of the following to indicate whether the student's answer is correct:

- `True`: Indicates that the student answered correctly for all response fields.

- `False`: Indicates that the student answered incorrectly. All response fields are marked as incorrect.

- A dictionary of the form: `{ 'ok': True, 'msg': 'Message' }` If the dictionary's value for `ok` is set to `True`, all response fields are marked correct. If it is set to `False`, all response fields are marked incorrect. The `msg` is displayed below all response fields, and it may contain XHTML markup. For information about providing partial credit for learners' answers, see *Providing Partial Credit for Custom Python-Evaluated Input Problems*.

- A dictionary of the form

```
{ 'overall_message': 'Overall message',
    'input_list': [
        { 'ok': True, 'msg': 'Feedback for input 1'},
        { 'ok': False, 'msg': 'Feedback for input 2'},
        ... ] }
```

The last form is useful for responses that contain multiple response fields. It allows you to provide feedback for each response field individually, as well as a message that applies to the entire response.

The following example shows another checking function.

```
def check_func(expect, answer_given):
    check1 = (int(answer_given[0]) == 1)
    check2 = (int(answer_given[1]) == 2)
    check3 = (int(answer_given[2]) == 3)
    return {'overall_message': 'Overall message',
            'input_list': [
                { 'ok': check1, 'msg': 'Feedback 1'},
                { 'ok': check2, 'msg': 'Feedback 2'},
                { 'ok': check3, 'msg': 'Feedback 3'} ] }
```

The function checks that the user entered 1 for the first input, 2 for the second input, and 3 for the third input. It provides feedback messages for each individual input, as well as a message displayed below the entire problem.

Create a Custom Python-Evaluated Input Problem in Script Tag Format

To create a custom Python-evaluated input problem using a `<script>` tag:

1. In the component editor, modify the example as needed.

2. Click **Save**.

Problem Code:

```
<problem>
<p>This question has two parts.</p>

<script type="loncapa/python">

def test_add(expect, ans):
    try:
        a1=int(ans[0])
        a2=int(ans[1])
        return (a1+a2) == int(expect)
    except ValueError:
        return False

def test_add_to_ten(expect, ans):
    return test_add(10, ans)

</script>

<p>Part 1: Enter two integers that sum to 10. </p>
<customresponse cfn="test_add_to_ten">
        <textline size="10" correct_answer="3" label="Integer #1"/><br/>
        <textline size="10" correct_answer="7" label="Integer #2"/>
</customresponse>

<p>Part 2: Enter two integers that sum to 20. </p>
<customresponse cfn="test_add" expect="20">
        <textline size="10" label="Integer #1"/><br/>
        <textline size="10" label="Integer #2"/>
</customresponse>

<solution>
    <div class="detailed-solution">
        <p>Explanation</p>
        <p>For part 1, any two numbers of the form <i>n</i> and <i>10-n</i>,
        where <i>n</i> is any integer, will work. One possible answer would
        be the pair 0 and 10.</p>
        <p>For part 2, any pair <i>x</i> and <i>20-x</i> will work, where <i>
        x</i> is any real number with a finite decimal representation. Both
        numbers have to be entered either in standard decimal notation or in
        scientific exponential notation. One possible answer would be the
        pair 0.5 and 19.5. Another way to write this would be 5e-1 and 1.95e1.</p>
    </div>
</solution>
</problem>
```

Templates

The following template includes answers that appear when the student clicks **Show Answer**.

```
<problem>

<script type="loncapa/python">
def test_add(expect,ans):
  a1=float(ans[0])
  a2=float(ans[1])
  return (a1+a2)== float(expect)
</script>

<p>Problem text</p>
<customresponse cfn="test_add" expect="20">
        <textline size="10" correct_answer="11" label="Integer #1"/><br/>
        <textline size="10" correct_answer="9" label="Integer #2"/>
</customresponse>

    <solution>
        <div class="detailed-solution">
          <p>Solution or Explanation Heading</p>
          <p>Solution or explanation text</p>
        </div>
    </solution>
</problem>
```

The following template does not return answers when the student clicks **Show Answer**. If your problem doesn't include answers for the student to see, make sure to set **Show Answer** to **Never** in the problem component.

```
<problem>

<script type="loncapa/python">
def test_add(expect,ans):
  a1=float(ans[0])
  a2=float(ans[1])
  return (a1+a2)== float(expect)
</script>

<p>Enter two real numbers that sum to 20: </p>
<customresponse cfn="test_add" expect="20">
        <textline size="10"  label="Integer #1"/><br/>
        <textline size="10"  label="Integer #2"/>
</customresponse>

    <solution>
        <div class="detailed-solution">
          <p>Solution or Explanation Heading</p>
          <p>Solution or explanation text</p>
        </div>
    </solution>
</problem>
```

7.39.4 Answer Tag Format

The answer tag format encloses the Python script in an `<answer>` tag, instead of using a Python function with a `<script>` tag, as in the following example.

```
<answer>
if answers[0] == expect:
    correct[0] = 'correct'
    overall_message = 'Good job!'
else:
    correct[0] = 'incorrect'
    messages[0] = 'This answer is incorrect'
    overall_message = 'Please try again'
</answer>
```

Important: Python honors indentation. Within the <answer> tag, you must begin your script with no indentation.

The Python script interacts with these variables in the global context:

- answers: An ordered list of answers the student provided. For example, if the student answered 6, answers[0] would equal 6.

- expect: The value of the expect attribute of <customresponse> (if provided).

- correct: An ordered list of strings indicating whether the student answered the question correctly. Valid values are "correct", "incorrect", and "unknown". You can set these values in the script.

- messages: An ordered list of messages that appear under each response field in the problem. You can use this to provide hints to users. For example, if you include messages[0] = "The capital of California is Sacramento", that message appears under the first response field in the problem.

- overall_message: A message that appears below the entire problem. You can use this to provide a hint that applies to the entire problem rather than a particular response field.

Create a Custom Python-Evaluated Input Problem in Answer Tag Format

1. In the component editor, modify the example as to use the``<answer>`` tag instead of <script>. You can copy the sample code below.

2. Click **Save**.

```
<problem>
    <p>What is the sum of 2 and 3?</p>

    <customresponse expect="5">
    <textline math="1" />
    </customresponse>

    <answer>
if answers[0] == expect:
    correct[0] = 'correct'
    overall_message = 'Good job!'
else:
    correct[0] = 'incorrect'
    messages[0] = 'This answer is incorrect'
    overall_message = 'Please try again'
    </answer>
</problem>
```

Important: Python honors indentation. Within the <answer> tag, you must begin your script with no indentation.

7.39.5 Providing Partial Credit for Custom Python-Evaluated Input Problems

You can configure a custom Python-evaluated input problem that gives partial credit for learners' answers.

The following example demonstrates a sample problem that allows partial credit. The learner's score equals the answer divided by 100.

The following code demonstrates the configuration of this problem.

```
<problem>
<p>In the following problem, the learner receives a score that equals the
   answer / 100. If the learner's answer is greater tahn 100 or less than 0,
   the score equals 0.</p>

<script type="loncapa/python">

def give_partial_credit(expect, ans):
  ans = float(ans)
  if ans > 100 or ans <; 0:
      # Assign a score of zero if the answer is less than zero or over 100.
      ans = 0
  grade = ans/100
  return {
      'input_list': [
          { 'ok': True, 'msg': 'Your grade is ' + str(ans) + '%', 'grade_decimal':grade},
      ]
  }
</script>

<p>Enter a number beween 0 and 100.</p>
<customresponse cfn="give_partial_credit">
  <textline points="100" size="40" label="Ans1"/><br/>
</customresponse>
</problem>
```

In this example:

- The `points` attribute of the `<customresponse>` tag specifies that the question is worth 100 points.

- The function `give_partial_credit` checks that the answer is between 0 and 100, and if so divides the

learner's answer by 100 to determine the grade.

- The `input_list` that is returned specifies that:

    - The answer is acceptable and can receive partial or full credit, with the item `'ok':   True`.

    - The learner receives the message `Your grade is` followed by the percent grade, with the item `'msg':
      'Your grade is ' + str(ans) + '%'`.

    - The grade assigned is the learner's answer divided by 100, with the item `'grade_decimal':grade`.

You can enhance and apply this example for your own problems in which you need to assign learners partial credit.

7.39.6 Create a Randomized Custom Python-Evaluated Input Problem

You can create a custom Python-evaluated input problem that randomizes variables in the Python code.

Note: In the problem settings, you must set the **Randomization** value to something other than **Never** to have Python
variables randomized. See *Randomization* for more information.

The following example demonstrates using randomization with a Python-evaluated input problem.

Note: This example uses the method `random.randint` to generate random numbers. You can use any standard
Python library for this purpose.

```
<problem>
  <p>Some problems in the course will utilize randomized parameters.
    For such problems, after you check your answer you will have the option
    of resetting the question, which reconstructs the problem with a new
    set of parameters.</p>
<script type="loncapa/python">
x1 = random.randint(0, 100)
x2 = random.randint(0, 100)
y = x1+x2
</script>
<p>Let (x_1 = $x1) and (x_2 = $x2). What is the value of (x_1+x_2)?</p>
<numericalresponse answer="$y">
  <responseparam type="tolerance" default="0.01%" name="tol"
    description="Numerical Tolerance"/>
  <textline size="10"/>
</numericalresponse>
<solution>
  <p><b>Explanation:</b></p>
</solution>
</problem>
```

7.40 Zooming Image Tool

You may want to present information to your students as an image. If your image is very large or very detailed,
students may not be able to see all the information in the image. You can use the zooming image tool to enlarge areas
of your image as the student moves the mouse over the image, as in the example below.

You can view the chemical structures of the molecules by clicking on them. The magnified view also lists the enzymes involved in each step.
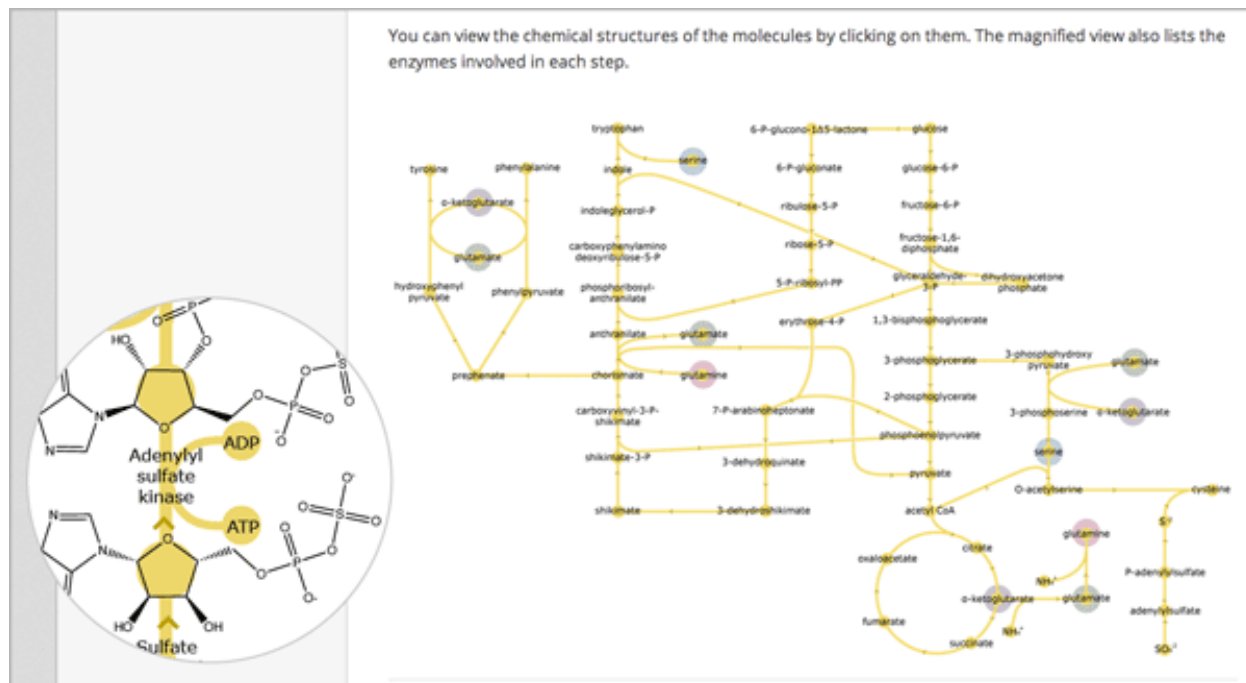
7.40.1 Components of a Zooming Image Tool

To create a zooming image tool, you need the following files.

- The image that you want students to see when they access the unit.

- The image that appears in the magnified area when a student clicks the regular image. This image may be larger than the regular image.

- The **jquery.loupeAndLightbox.js** JavaScript file. Every zooming image tool uses this JavaScript file, and you won't make any changes to it. To download this file, right-click here, and then click **Save Link As** to save the file on your computer.

7.40.2 Create a Zooming Image Tool

1. Upload your regular-sized image file, your small image file, and the **jquery.loupeAndLightbox.js** file to the **Files & Uploads** page. For more information about how to do this, see *Adding Files to a Course*.

2. Under **Add New Component**, click **html**, and then click **Zooming Image**.

3. In the new component that appears, click **Edit**.

4. In the component editor, replace the default problem text with your own text.

5. Switch to the **HTML** tab.

6. Replace the following placeholders with your own content.

   - Replace the following file name and path with the name and path of the image that you want to appear magnified when the user hovers over the regular image.

   https://studio.edx.org/c4x/edX/DemoX/asset/pathways_detail_01.png

   For example, your file name and path may be **/static/Image1.jpg**.

- Replace the following file name and path with the name and path of the image that you want to appear when the page opens.

  https://studio.edx.org/c4x/edX/DemoX/asset/pathways_overview_01.png

  For example, your file name and path may be **/static/Image2.jpg**.
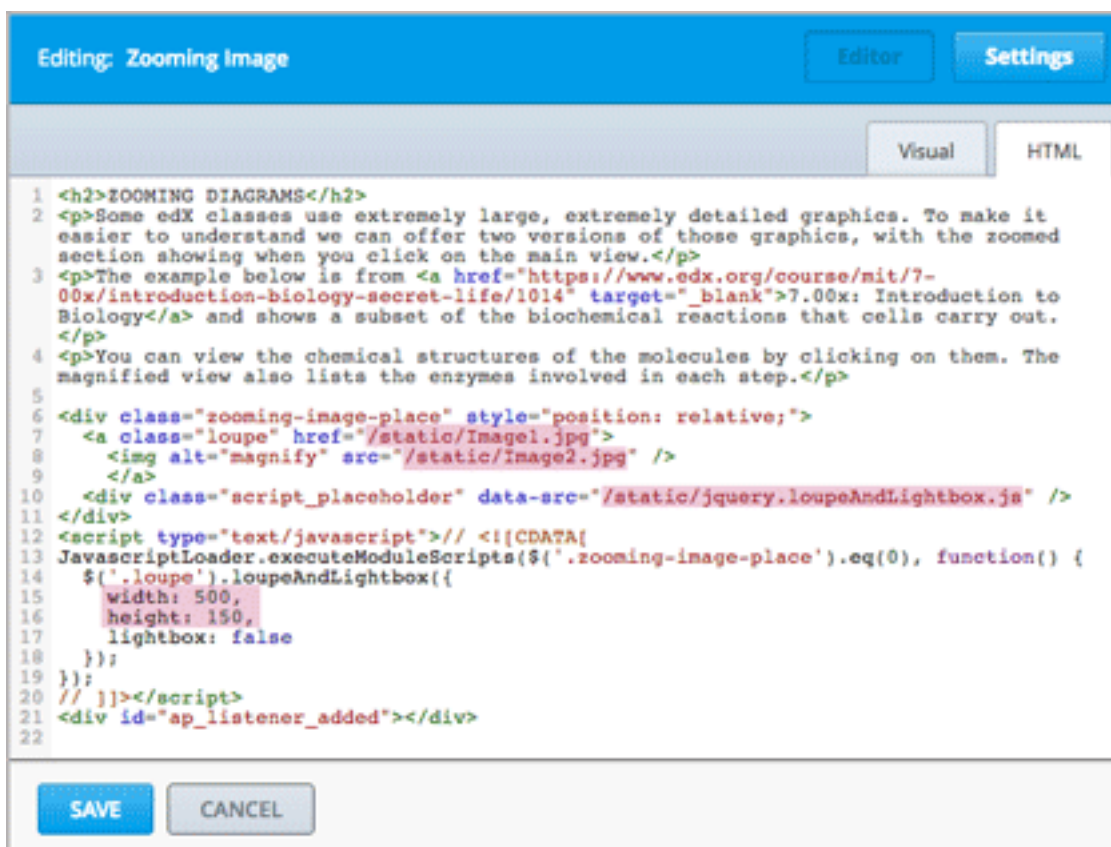
- Replace the following name and file path with the name and path of the JavaScript file for your course.

  https://studio.edx.org/c4x/edX/DemoX/asset/jquery.loupeAndLightbox.js

  Because you uploaded the **jquery.loupeAndLightbox.js** file to the **Files & Uploads** page, your file name and path is **/static/jquery.loupeAndLightbox.js**.

- (Optional) If you want the magnified area to be larger or smaller, change the **width** and **height** values from 350 to larger or smaller numbers. For example, you can change both numbers to 450. Or, if you want a horizontal oval instead of a circle, you can change the **width** value to a number such as 500 and the **height** value to a number such as 150.

The HTML in your zooming image tool may resemble the following.

7. Click **Save** to save the HTML component.

7.41 A Brief Introduction to MathJax in Studio

To write clear and professional-looking symbols and equations, we use a LaTeX-like language called MathJax. Your MathJax equations can appear with other text in the paragraph (inline equations) or on their own lines (display equations).

- For inline equations, you can do either of the following.

  - Surround your Mathjax expression with backslashes and **parentheses**.

    ```
    \( equation \)
    ```

  - Surround your Mathjax expression with [mathjaxinline] tags. Note that these tags use square brackets ([]).

    [mathjaxinline] equation [/mathjaxinline]

- For display equations, you can do either of the following.

  - Surround your Mathjax expression with backslashes and **brackets**.

    ```
    \[ equation \]
    ```

  - Surround your Mathjax expression with [mathjax] tags. Note that these tags use square brackets ([]).

    [mathjax] equation [/mathjax]

You can use MathJax in HTML (text) components and in Problem components.

Note: Complete MathJax documentation (together with a testing tool) can be found at http://www.onemathematicalcat.org/MathJaxDocumentation/TeXSyntax.htm.

7.41.1 HTML (Text) Components

In the HTML component editor, you can use MathJax both in Visual view and in HTML view.

HTML component editor: Visual view

HTML component editor: HTML view

Studio: Unit page

7.41.2 Problem Components

In the Problem component editor, you can use MathJax both in the Simple Editor and in the Advanced Editor.

In the example problem below, note that the Einstein equation in the explanation is enclosed in backslashes and parentheses, so it appears inline with the text. The Navier-Stokes equation is enclosed in backslashes and brackets, so it appears on its own line.

Editing: Multiple Choice — Editor — Settings

H1 ≡ ≡ ABC 123 ☑ Advanced Editor ?

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?
( ) \(E = m c^2 \)
( ) \(A = \pi r^2 \)
(x) \(\rho \left(\frac{\partial \bf v}{\partial t} + \bf{ v \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v + f } \)
( ) \(V = I R \)

[explanation]
Although a true understanding of Einstein's equation \(E = m c^2 \) relating mass and energy requires years of study, the Navier-Stokes equation \[\rho \left(\frac{\partial \bf v}{\partial t} + \bf{ v \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v + f } \] is computationally more complex (and frequently gives students nightmares).
[explanation]

SAVE   CANCEL

Problem component editor: Simple Editor

Editing: Multiple Choice — Editor — Settings

```
1  <problem>
2  <p>This nonsensical question is for demonstration
   purposes only.</p>
3
4  <p>Which of the following equations is the most
   complex?</p>
5  <multiplechoiceresponse>
6    <choicegroup type="MultipleChoice">
7      <choice correct="false">\( E = m c^2 \)</choice>
8      <choice correct="false">\( A = \pi r^2 \)</choice>
9      <choice correct="true">\( \rho \left(
   \frac{\partial \bf v}{\partial t} + \bf{ v \cdot
   \nabla v} \right) = - \nabla p + \mu \nabla^2 \bf{v +
   f } \)</choice>
10     <choice correct="false">\( V = I R \)</choice>
11   </choicegroup>
12 </multiplechoiceresponse>
13
14 <p>    </p>
15 <h2>Explanation</h2>
16 <p>Although a true understanding of Einstein's
   equation \( E = m c^2 \) relating mass and energy
   requires years of study, the Navier-Stokes equation \[
   \rho \left( \frac{\partial \bf v}{\partial t} + \bf{ v
   \cdot \nabla v} \right) = - \nabla p + \mu \nabla^2
   \bf{v + f } \] is computationally more complex (and
   frequently gives students nightmares).</p>
17
18 </problem>
```

SAVE   CANCEL

Problem component editor: Advanced Editor

MULTIPLE CHOICE (1 point possible)

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?

○ $E = mc^2$

○ $A = \pi r^2$

○ $\rho\left(\frac{\partial v}{\partial t} + v \cdot \nabla v\right) = -\nabla p + \mu \nabla^2 v + f$

○ $V = IR$

EXPLANATION

Although a true understanding of Einstein's equation $E = mc^2$ relating mass and energy requires years of study, the Navier-Stokes equation

$$\rho\left(\frac{\partial v}{\partial t} + v \cdot \nabla v\right) = -\nabla p + \mu \nabla^2 v + f$$

is computationally more complex (and frequently gives students nightmares).

Check   Save

LMS

Edit   Delete

MULTIPLE CHOICE (1 point possible)

This nonsensical question is for demonstration purposes only.

Which of the following equations is the most complex?

○ $E = mc^2$

○ $A = \pi r^2$

○ $\rho\left(\frac{\partial v}{\partial t} + v \cdot \nabla v\right) = -\nabla p + \mu \nabla^2 v + f$

○ $V = IR$

EXPLANATION

Although a true understanding of Einstein's equation $E = mc^2$ relating mass and energy requires years of study, the Navier-Stokes equation

$$\rho\left(\frac{\partial v}{\partial t} + v \cdot \nabla v\right) = -\nabla p + \mu \nabla^2 v + f$$

is computationally more complex (and frequently gives students nightmares).

Check   Save

Studio: Unit page

Creating Content Experiments

8.1 Overview of Content Experiments

This section provides an introduction to using content experiments.

- *Overview*
- *Courses with Multiple Content Experiments*

8.1.1 Overview

You use content experiments to show different course content to different groups of learners. Also known as "A/B tests" or "split tests", content experiments enable you to research and compare the performance of learners in different groups to gain insight into the relative effectiveness of your course content.

Information on analyzing events from content experiments is included in the edX Researcher Guide.

8.1.2 Courses with Multiple Content Experiments

You can run multiple content experiments in your course. You can set up each experiment to use the same groups of learners, or you can set up each experiment to be independent and use a different grouping.

Important: If your course has multiple experiments, it is critical that you decide in advance if the experiments share the same groups of learners or if each experiment has its own unique grouping. If two experiments share the same grouping, then any learner that is in Group A for the first experiment will also be in Group A for the second one. If you want the experiments to be independent, then the experiments must use different groupings so that learners are randomly assigned for each experiment.

To determine the available groupings of learners, you set up group configurations *using Studio* or *using XML*.

You then select which group configuration to use when you add a content experiment *using Studio* or *using XML*.

8.2 Configure Your Course for Content Experiments

This section provides instructions to configure your course to use content experiments.

8.2.1 Enable Content Experiments

To enable content experiments in your course, you add `split_test` to the **Advanced Modules List** in Advanced Settings.

Note: `split_test` is the internal edX Platform name for a content experiment.

---

1. From the **Settings** menu, select **Advanced Settings**.

2. On the **Advanced Settings** page, locate **Advanced Modules List**.

3. In the **Advanced Modules List** field, add `"split_test"`. Be sure that you include the double quotation marks.

   If you have multiple values, ensure that they are separated by commas (`,`).

   For example, the text in the **Advanced Modules List** field may resemble the following:

   ```
   [
     "lti",
     "word_cloud",
     "split_test"
   ]
   ```

4. Select **Save Changes**.

8.2.2 Overview of Group Configurations

Before you can create content experiments, you must specify at least one group configuration for your course.

A group configuration defines how many groups of learners are in an experiment. You can have any number of group configurations in your course. When you create a content experiment, you select the group configuration to use.

For example, you may want to do two different experiments at different times during your course. In one content experiment, learners either see a video or complete a reading assignment. You can then include problems so that you can see which group learned the material more completely. For this content experiment, you need a group configuration that assigns your learners to two experiment groups.

In the other content experiment, you can present the same question using four different types of problems. For this content experiment, you need a group configuration that assigns your learners to four experiment groups.

Assigning Learners to Experiment Groups

The edX Platform assigns learners to each experiment group in a group configuration.

Experiment group assignments are:

- Dynamic

  The edX Platform assigns a learner to an experiment group the first time he or she views a content experiment that uses the group configuration.

- Random

  You cannot control which learners are assigned to which experiment group.

- Evenly distributed

  The edX Platform keeps track of the size of experiment groups, and assigns new learners to groups evenly. For example, if you have two experiment groups in a configuration, each group includes 50% of the learners in the course; if you have four experiment groups, each group includes 25% of the learners.

- Permanent

  Learners remain in their assigned experiment groups regardless of how many content experiments you set up that use the same group configuration.

8.2.3 Set up Group Configurations in edX Studio

Note: You must *enable content experiments* before you can set up group configurations.

To set up group configurations, on the **Settings** menu, select **Group Configurations**. The **Group Configurations** page opens.

From this page you can *create*, *edit*, and *delete* group configurations. You can also *view experiments that use a group configuration*.

Create a Group Configuration

You can create a group configuration at any time.

1. On the **Group Configurations** page, under **Experiment Groups**, select **New Experiment Group**. The following page opens:

2. Enter a name in the **Group Configuration Name** field. Use a meaningful name, because you will select from group configuration names when you create content experiments. Learners do not see the group configuration name.

3. Optionally, enter a description for the new group configuration.

4. By default, a new configuration already contains two groups. Modify the groups or add and delete groups as needed. A group configuration must have at least one group.

   • Modify group names as needed. You see group names in the unit page in Studio, but group names are not visible to learners.

   • Select **Add another group** to include another group as part of the configuration.

   • Select the **X** to the right of an existing group to remove it from the configuration. A group configuration must have at least one group.

5. Select **Create** to save the new group configuration.

The group configuration is then listed in the page. You can see the number of groups that the configuration contains, as well as whether the configuration is in use in the course:

Edit a Group Configuration

Important: You can change the name of a group configuration at any time. However, before you modify any other characteristics of a group configuration that is currently used in a running course, review *Guidelines for Modifying Group Configurations*.

1. On the **Group Configurations** page, hover over the group configuration and select **Edit**.

The following page opens:

2. Modify the name and description as needed.

3. Modify groups in the configuration as needed. See *Create a Group Configuration* for details.

4. Select **Save** to save your changes.

Delete a Group Configuration

Note: You can only delete a group configuration that is not currently used in a content experiment. You cannot delete a group configuration that is used in a content experiment.

1. On the **Group Configurations** page, hover over the group configuration and select the Delete icon.
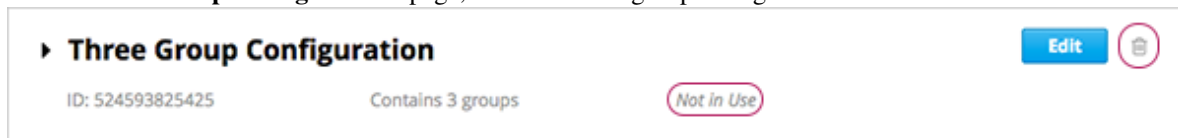
2. When prompted to confirm the deletion, select **Delete**.

View Experiments that Use a Group Configuration

You can view the experiments that use each of your group configurations.

On the **Group Configurations** page, select the name of a group to see its details. You see links to experiments that use the group configuration:

Select a link to go to the unit page that contains the experiment.

View a Group Configuration from an Experiment

When working with a content experiment, you can view details about the group configuration used by that experiment in two ways:

- In a unit that contains a content experiment, in the content experiment block, select the name of the group configuration.

- At the top of the content experiment page, select the name of the group configuration.

In both cases, the group configuration opens:

You can use the link in the group configuration to return to the unit that contains the content experiment.

8.2.4 Guidelines for Modifying Group Configurations

Review these guidelines if you must modify a group configuration after a course starts. These guidelines apply for courses built in Studio or OLX.

Modifying a Group Configuration

After the course starts, **do not**:

- Delete group configurations.
- Change the `id` value of a group configuration.

Modifying Experiment Groups

After the course starts, **do not** change the `id` value of an experiment group.

You can change experiment group names at any time.

Removing Experiment Groups from Group Configurations

After a course in which you are running a content experiment has started, learners in a specific experiment group might have difficulties with the content or with the course experience. In this situation, you can remove the experiment group from the group configuration. Content that was specified for that experiment group is then no longer visible to learners.

Learners in the removed experiment group are reassigned evenly to one of the other experiment groups in the group configuration. Any problems that these learners completed in the removed experiment group content do not count toward their grades. The learners must begin the problem set again and complete all the problems in the experiment group content to which they are reassigned.

Removing an experiment group affects event data for the course. Ensure that researchers who are evaluating your course results are aware of the experiment group that you removed and the date on which you removed it.

8.2.5 Set Up Group Configuration for OLX Courses

You define group configurations in the `policy.json` file in the `policies` directory of an OLX course.

To specify group configurations, you modify the value for the `user_partitions` policy key.

Note: `user_partitions` is the internal edX Platform name for group configurations.

The value for `user_partitions` is a JSON collection of group configurations, each of which defines the experiment groups of learners.

Note: Use names for group configurations that are meaningful. You select from the list of group configuration names when you add a content experiment.

See the following examples for more information.

Example: One Group Configuration

The following code shows an example JSON object that defines a group configuration with two learner segments.

```
"user_partitions": [{"id": 0,
                 "name": "Name of the group configuration",
                 "description": "Description of the group configuration.",
                 "version": 1,
                 "groups": [{"id": 0,
                            "name": "Group 1",
                            "version": 1},
                           {"id": 1,
                            "name": "Group 2",
                            "version": 1}]
                   }
               ]
```

In this example:

- The `"id": 0` identifies the group configuration. For XML courses, the value is referenced in the `user_partition` attribute of the `<split_test>` element in the content experiment file.

- The `groups` array identifies the experiment groups to which learners are randomly assigned. For XML courses, each group `id` value is referenced in the `group_id_to_child` attribute of the `<split_test>` element.

Example: Multiple Group Configurations

The following code shows an example JSON object that defines two group configurations. The first group configuration divides learners into two experiment groups, and the second divides learners into three experiment groups.

```
"user_partitions": [{"id": 0,
                  "name": "Name of Group Configuration 1",
                  "description": "Description of Group Configuration 1.",
                  "version": 1,
                  "groups": [{"id": 0,
                             "name": "Group 1",
                             "version": 1},
                            {"id": 1,
                             "name": "Group 2",
                             "version": 1}]}
```

```
                          {"id": 1,
                           "name": "Name of Group Configuration 2",
                           "description": "Description of Group Configuration 2.",
                           "version": 1,
                           "groups": [{"id": 0,
                                       "name": "Group 1",
                                       "version": 1},
                                      {"id": 1,
                                       "name": "Group 2",
                                       "version": 1}
                                      {"id": 2,
                                       "name": "Group 3",
                                       "version": 1}
                                      ]}
               ]
```

Note: As this example shows, each group configuration is independent. Group IDs and names must be unique within a group configuration, but not across all group configurations in your course.

8.3 Add Content Experiments to Your Course

This section provides instructions for adding content experiments to your course.

- *Before Adding Content Experiments*
- *Add a Content Experiment in Studio*
- *Add a Content Experiment in OLX*

8.3.1 Before Adding Content Experiments

Before you add content experiments to your course, ensure that you have completed the following tasks.

- *Enable Content Experiments*
- *Set up Group Configurations in edX Studio*

8.3.2 Add a Content Experiment in Studio

You can add a content experiment in a unit or container page. In Studio, you create and view content for all groups in the content experiment in a container page for the experiment, as shown in *Create Content for Groups in the Content Experiment*.

When a learner views the unit with the content experiment, she has no indication there is a content experiment in the unit, and the content experiment display name is not shown. She sees only the content that you configure for the group she is assigned to. To the learner, the unit with the content experiment is no different than any other unit.

To configure a content experiment in Studio, you perform the following tasks.

1. *Create the content experiment*.

2. *Create content for groups in the content experiment*.

After you configure a content experiment, you can change its group configuration. For more information, see *Change the Group Configuration for a Content Experiment*.

Create the Content Experiment
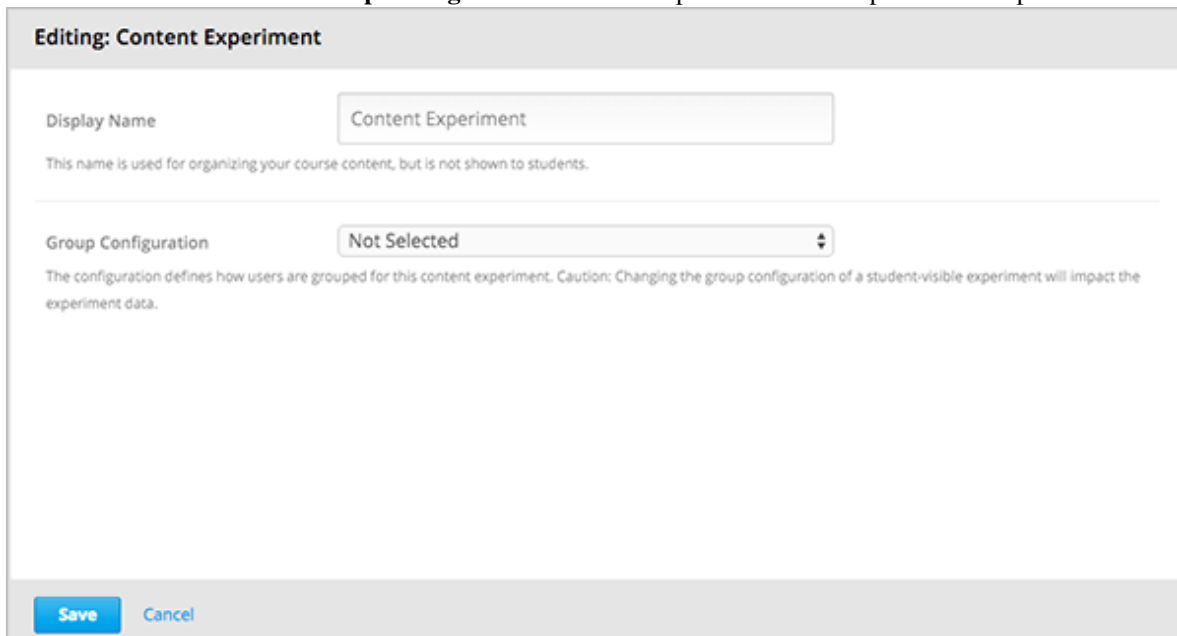
1. In the unit page, under **Add New Component**, select **Advanced**.

2. Select **Content Experiment**.

   A new content experiment is added to the unit.

Content Experiment	✏ EDIT ⧉ 🗑 ⋮
This block contains multiple components.	VIEW →
⚠ The experiment is not associated with a group configuration. Select a Group Configuration	
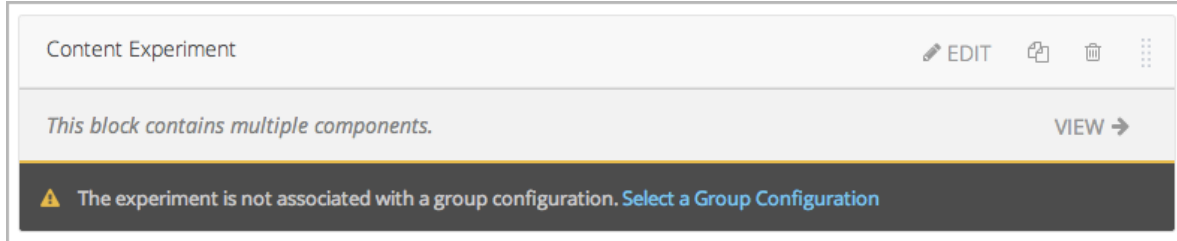
   You can work with the content experiment as you do any other component. For more information, see *Developing Course Components*.

3. Select either **Select a Group Configuration** or **Edit** to open the content experiment component.

Editing: Content Experiment

Display Name
[Content Experiment]

This name is used for organizing your course content, but is not shown to students.

Group Configuration
[Not Selected ▲▼]

The configuration defines how users are grouped for this content experiment. Caution: Changing the group configuration of a student-visible experiment will impact the experiment data.

[Save] Cancel

4. Next to **Group Configuration**, select a group configuration.

5. In the **Display Name** field, enter the name of the component. The display name is only used in Studio; learners do not see this value.

6. Select **Save**.

The content experiment is displayed as a component that contains other components. For more information, see *Components that Contain Other Components*.

Note: You cannot duplicate a content experiment.

You can now create content for the groups in the experiment.

Create Content for Groups in the Content Experiment

After you select a group configuration, in the content experiment component, select **View**.

The content experiment page that opens automatically includes a container for each group that is defined in the group configuration you selected. For example, if you select a group configuration that defines Group A and Group B, you see the following page.
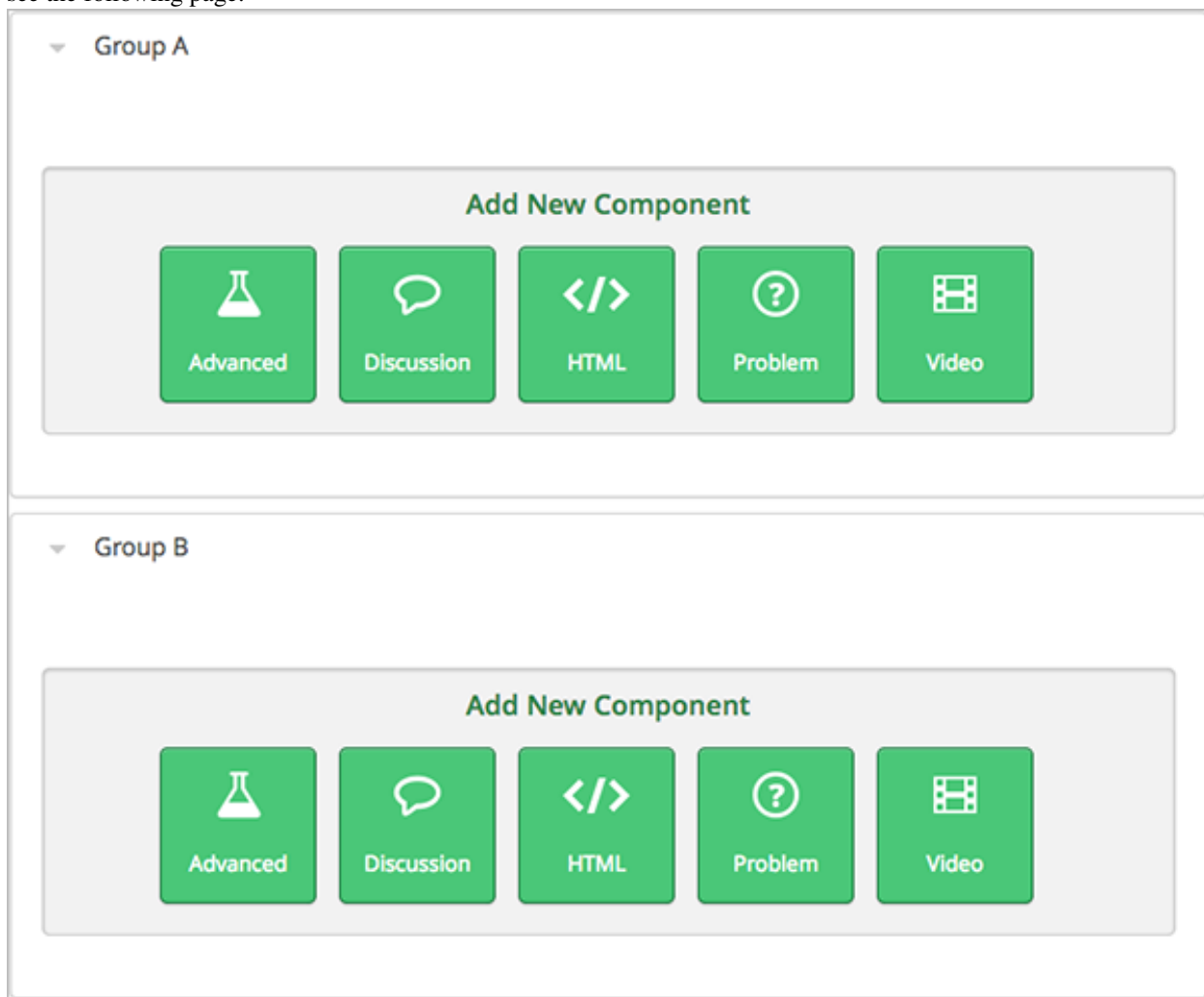
You add content for both groups as needed, just as you would add content to any container page. For more information, see *Components that Contain Other Components*.

For example, you can add an HTML component and a video to Group A.

Note: It is valid, and can be useful, to have no content for a group in the experiment. For example, if one group has a video and another group has no content, you can analyze the effect of the video on learner performance.

Change the Group Configuration for a Content Experiment

You can change the group configuration for a content experiment. When you change the group configuration, you must add components to any new groups that you create. You can use the components from the previous groups, as well as create new components.

Warning: Changing the group configuration of a learner-visible experiment will affect the experiment data.

1. Open the unit page of the unit that contains the content experiment.

2. In the content experiment component, select **Edit**.

Editing: Content Experiment

Display Name

Content Experiment

This name is used for organizing your course content, but is not shown to students.

Group Configuration

2 Groups

The configuration defines how users are grouped for this content experiment. Caution: Changing the group configuration of a student-visible experiment will impact the experiment data.

Save Cancel

3. Select a different group configuration.

4. Select **Save**.

5. You must now add components to the new groups in the experiment. Select **View** to open the content experiment.

   You see that groups for the new configuration are empty, and any components that you had added to groups in the previous configuration are now moved to a section called **Inactive Groups**.
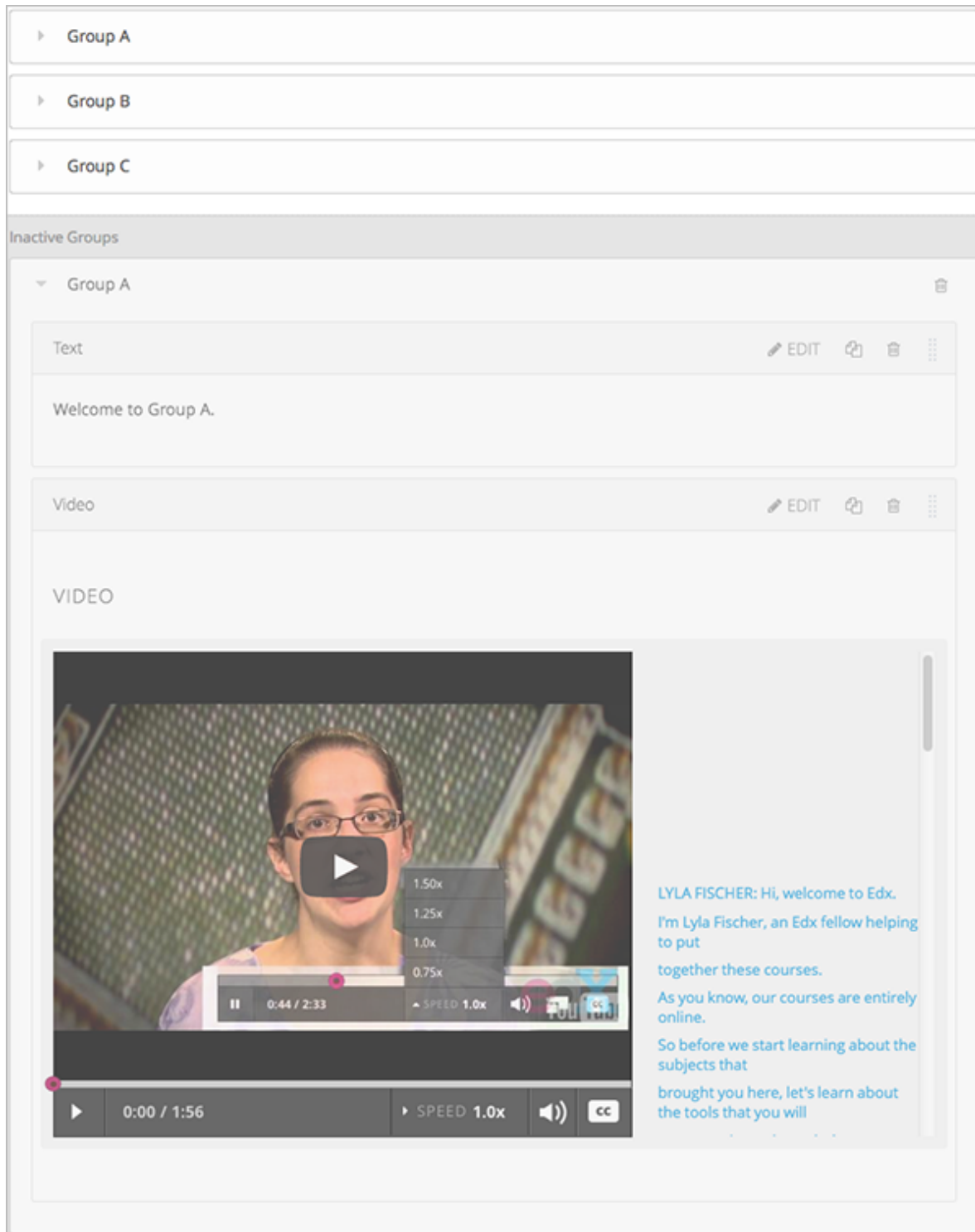
6. Drag and drop components from the **Inactive Groups** section into the new groups. You can also create new components in the new groups.

8.3.3 Add a Content Experiment in OLX

You work with multiple XML files to configure a content experiment. This section steps through the files involved in a content experiment that shows different content to two different groups of learners.

Define the Content Experiment in the Sequential File

You reference a content experiment in the file for the subsection, or sequential, in the `sequential` directory. For example:

```
...
<vertical url_name="name for the unit that contains the A/B test" display_name="A/B Test Unit">
    <split_test url_name="name of A/B test file in the split_test folder"/>
</vertical>
.....
```

The `<split_test>` element's `url_name` value references the name of the content experiment file in the `split_test` directory.

> **Caution:** You can only define a content experiment in a unit, or vertical, in which different collections of components are associated with different experiment groups. You cannot define a content experiment at a subsection (sequential) or section (chapter) level and have different units or subsections associated with different groups.

Define the Experiment Content in the Split Test File

After you define the content experiment in the sequential file, you define the course content you want to test in the file in the `split_test` directory. This is the file referenced in the `<split_test>` element in the sequential file, as shown above.

In the content experiment file, you add elements for the experiment content. For this example, you add two `<vertical>` elements to compare the two different sets of content.

```
<split_test url_name="AB_Test.xml" display_name="A/B Test" user_partition_id="0"
        group_id_to_child='{"0": "i4x://path-to-course/vertical/group_a",
                            "1": "i4x://path-to-course/vertical/group_b"}'>
    <vertical url_name="group_a" display_name="Group A">
        <html>Welcome to group A.</html>
        <video url_name="group_a_video"/>
    </vertical>
    <vertical url_name="group_b" display_name="Group B">
        <html>Welcome to group B.</html>
        <problem display_name="Checkboxes">
            <p>A checkboxes problem presents checkbox buttons for learner input.
                Learners can select more than one option presented.</p>
            <choiceresponse>
                <checkboxgroup direction="vertical" label="Select the answer that matches">
                    <choice correct="true">correct</choice>
                    <choice correct="false">incorrect</choice>
                    <choice correct="true">correct</choice>
                </checkboxgroup>
            </choiceresponse>
        </problem>
    </vertical>
</split_test>
```

In this example:

- The `user_partition_id` value references the ID of the experiment defined in the `policy.json` file.

- The `group_id_to_child` value references the IDs of the groups defined in the `policy.json` file and maps the group IDs to specific content.

  For example, the value for group `0`, `i4x://path-to- course/vertical/group_a`, maps to the `<vertical>` element with the `url_name` equal to `group_a`. Therefore, learners in group 0 see the content in that vertical.

For information about the `policy.json` file, see *Set Up Group Configuration for OLX Courses*.

8.4 Test Content Experiments

You should test content experiments in your course before the course starts, to ensure that content is delivered to experiment groups as you intended.

When you view a unit that contains a content experiment in the LMS Staff view, you can select one of the experiment groups from a drop-down list. The unit page then shows the content as the selected group of learners sees it.

For example, in the following image, Group 0 is selected, and the HTML component and video that is part of Group 0 is displayed.
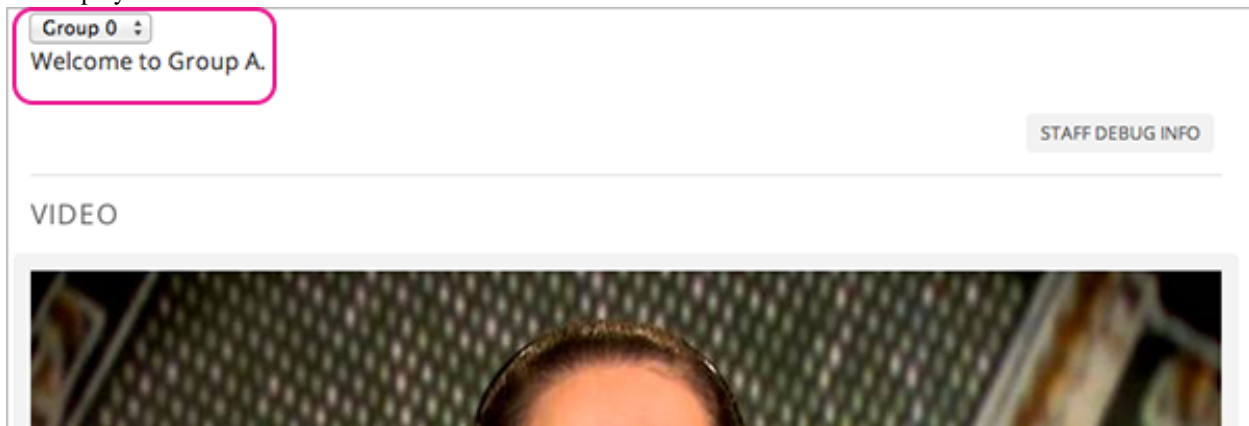
You can change the experiment group selection to view the content that a different experiment group of learners sees.
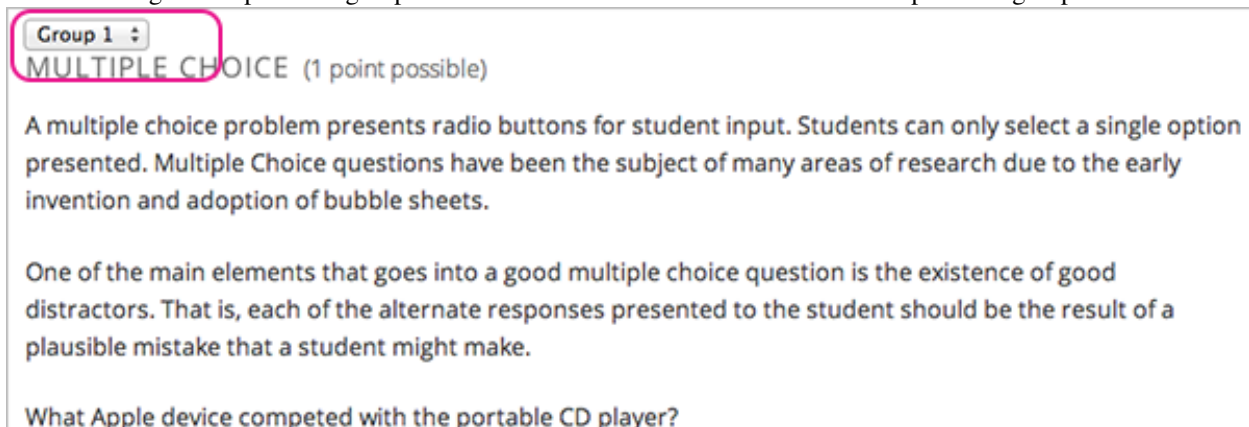
Note: The example course content in this section uses content experiment terminology ("Welcome to Group A", for example) to make the functionality clear. Typically, you would not use terminology in course content that would make learners aware of the experiment.

Including Learner Cohorts

9.1 Using Cohorts in Your Courses

This section provides an introduction to using cohorts.

- *Overview*
- *Options for Assigning Learners to Cohorts*

9.1.1 Overview

To create smaller communities in your course, or design different course experiences for different groups of learners, you can *set up cohorts* in your course.

In discussion topics that are divided by cohort, learners can also communicate and share experiences privately within the cohort that they are assigned to. Cohort-specific discussion opportunities can help learners develop a sense of community, provide specialized experiences, and encourage deeper, more meaningful course involvement.

If you use cohorts in your course, you define a set of cohorts that reflect communities of learners, then select a strategy for *assigning learners to cohorts*.

Note:

- Every learner must be assigned to a cohort. This ensures that every learner has the ability to read and contribute to course discussion topics.

- Each learner can be in one and only one cohort.

To provide learners with a consistent experience throughout the course run, do not change cohort configuration or a learner's cohort assignment after your course begins.

For more information about using cohorts, see:

- *Enabling and Configuring the Cohorts Feature*

- *Setting Up Discussions in Courses with Cohorts*

- *Managing Discussions in Courses with Learner Cohorts*

For information about discussions in general, see *Managing Course Discussions*.

9.1.2 Options for Assigning Learners to Cohorts

Learners are assigned to cohorts either automatically or manually, depending on the types of cohorts that you create. Manual cohorts do not have learners assigned to them unless you manually add learners. Automatic cohorts have learners randomly assigned to them if learners do not belong to any cohort by the time they access the course content (including the course **Discussion** page or content-specific discussion topics). If you have not created any automated cohorts by the time learners access course content, a default automated cohort is created and used for automatic assignment, so that no learner in the course is without a cohort.

Determine the basic strategy that you will use to create cohorts. An automated assignment strategy means that you create cohorts to which learners are assigned automatically and randomly. A manual assignment strategy means that you create cohorts to which learners are assigned only when you or your course team manually adds them. You can use a hybrid assignment method by creating a combination of automated and manual cohorts. Typically, your purpose in including the cohort feature determines which assignment option you use for your course.

Note: You can add learners manually to any cohort, whether it was created as an automated cohort or a manual cohort.

Note: Although you can change the assignment method of a cohort at any time after you create it, you should have a cohort assignment strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary. Be aware of the implications of changing cohort configuration while your course is running. For more information, see *Altering Cohort Configuration in a Running Course*. In general, to provide learners with a consistent experience throughout the course run, do not change cohort configuration or a learner's cohort assignment after your course begins.

For more information about strategies for assigning learners to cohorts, see the following topics.

- *Automated Assignment: Making MOOC Discussions Manageable*

- *Manual Assignment: Grouping by Common Characteristics*

- *Hybrid Assignment: Accommodating Small Groups Within a Course*

- *Ensuring That All Learners Are Assigned: The Default Cohort*

Automated Assignment: Making MOOC Discussions Manageable

In very large courses, the number of posts that are made to course discussion topics can make for a daunting amount of daily reading. In such courses, dividing the enrollees into separate cohorts makes the volume of posts, responses, and comments by the members of each cohort more manageable, and is more likely to foster community feeling.

If you use the automated assignment strategy, you create several "auto" (automated) cohorts. Learners are automatically and randomly assigned to one of the auto cohorts when they first view any course content, including the course **Discussion** page or content-specific discussion topics. In this way, each learner in your course is assigned to a cohort; no learner is unassigned.

The following guidelines are based on the experiences of MOOC teams that have used cohorts in this way. They are suggested to help you determine how many automated cohorts to define for your course.

- Each cohort should be large enough to inspire lively participation and diverse points of view, but small enough to allow a sense of community to develop. Cohorts formed by random assignment tend to be successful if they include between 200 and 500 members.

- For every 10,000 students who enroll, approximately 200 to 400 students remain active in the discussions throughout the course run.

- Divide the estimated total enrollment of the course run by 10,000.

- Use the result as the number of automated cohorts to create.

For example, two days before it starts, a course has an enrollment of 80,000 students. To create small communities within the discussions, the course team enables cohorts and then creates eight automated cohorts. As learners visit the **Discussion** page or view the course content, they are randomly assigned to one of the eight cohorts. In divided discussion topics, learners read and respond only to contributions made by other members of the same cohort.

For more information, see *Implementing an Automated Assignment Strategy*.

Manual Assignment: Grouping by Common Characteristics

In SPOCs and other courses with small- to medium-sized enrollments, known existing commonalities can be used to identify cohorts. An example is a course that enrolls learners from different companies or with different educational backgrounds, or members of alumni or parent groups. When learners are assigned to cohorts on the basis of a characteristic that they share, they can privately discuss applications for what they are learning and explore resources and ideas that are of particular interest.

To implement this assignment strategy, you identify the "real-world" cohorts that your learners already belong to. You enable cohorts and then create "manual" cohorts to represent each of the real-world cohorts. You then manually assign each learner to a cohort. Every learner who enrolls, including those who enroll after the course starts, must be assigned to a cohort.

Note: To ensure that every learner is assigned to a cohort, you can set up a single automated cohort, as described for the *hybrid assignment strategy*. If you do not create an automated cohort, the system automatically creates a *default cohort* and assigns learners to it if necessary.

For more information, see *Implementing a Manual Assignment Strategy*.

Hybrid Assignment: Accommodating Small Groups Within a Course

For some courses, the manual assignment strategy is not feasible to execute, and the automated assignment strategy does not accommodate existing cohorts in the student body. The enrollment might be too large to complete manual assignments effectively, or only some of the learners might have strong defining characteristics among an otherwise diverse student body. For these courses, you can use a hybrid of the two strategies to implement cohorts.

An example is a course that enrolls members of an alumni association. The alumni want an opportunity to have private interactions, so manual assignment of those learners to a cohort makes sense. For other learners in the class, manual assignment is not needed: you can create one or more automated cohorts for the remaining learners in the course.

Before you implement the hybrid strategy, you identify the characteristics that define existing cohorts in the student body. You also decide whether you want the remaining learners in the course to be divided into their own, similarly-sized cohorts, or if you want them all to be in just one other cohort.

After you enable cohorts, you create a manual cohort for each student group that you identified. You manually assign learners who belong to each group to the corresponding cohort. You also set up automated cohorts for the other learners in the course, or rely on the default automated cohort. Any learners who are not assigned to a manual cohort are automatically assigned to one of the automated cohorts or to the default cohort when they first view any course content, including the course **Discussion** page or content-specific discussion topics. For best results when you use this strategy, you should complete all manual cohort assignments before the course starts and before learners begin viewing course content and discussion topics.

For more information, see *Implementing an Automated Assignment Strategy* and *Implementing a Manual Assignment Strategy*.

Ensuring That All Learners Are Assigned: The Default Cohort

If you enable cohorts in your course, all learners must be assigned to a cohort. To ensure that there are no learners in the course without a cohort, the system automatically creates a default cohort and assigns learners to it if necessary.

The default cohort is created only if you have not created at least one automated assignment cohort in your course by the time that the first learner accesses your course content. Learners who have not been manually assigned to a cohort when they access the course content are automatically assigned to the default cohort.

Learners who are in the default cohort see a cohort name of "Default Group" in discussion posts. If you want learners to see a different name for the default cohort, you can change its name. For details about renaming cohorts, see *Rename a Cohort*.
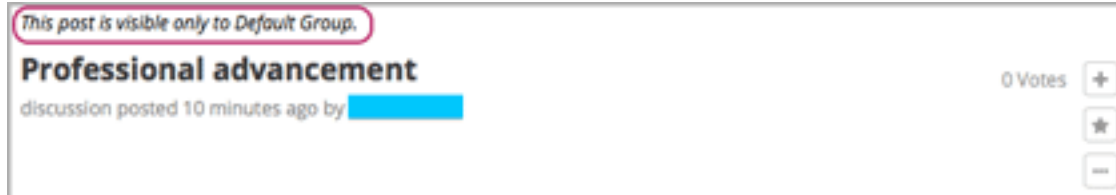
You can check the *learner profile information report* for your course to see if any learners are assigned to the default cohort, and change their cohort assignments. Note, however, that in divided discussion topics learners can only see posts by members of their currently assigned cohort: when a learner is reassigned, posts that he previously saw will seem to have "disappeared". To avoid negatively affecting the learner experience, any cohort assignment changes should be done as early in the course run as possible, so that learners' views of discussion posts and contributions remain consistent over time.

9.2 Enabling and Configuring the Cohorts Feature

This section provides information about setting up cohorts in your course.

- *Overview*
- *Implementing an Automated Assignment Strategy*
- *Implementing a Manual Assignment Strategy*
- *Enabling Cohorts in your Course*
- *Adding Cohorts*
- *Assign Learners to Cohorts Manually*
- *Assign Learners to Cohorts by Uploading a .csv File*
- *Altering Cohort Configuration in a Running Course*
- *Change Student Cohort Assignments*
- *Rename a Cohort*
- *Changing the Assignment Method of a Cohort*
- *Disable Cohorts in Your Course*

9.2.1 Overview

To use cohorts in your course, you must select a strategy for assigning your learners to cohorts: automated assignment, manual assignment, or a hybrid approach. For more information, see *Options for Assigning Learners to Cohorts*.

Note: Although you can change the assignment method for cohorts at any time, you should have a strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary.

You must also decide whether course-wide and content-specific discussion topics should be divided by cohort or unified for all learners.

After you decide on a cohort strategy for your course, complete these configuration steps (as applicable).

1. *Enable cohorts*.

2. Determine the method you want to use to assign students to cohorts.

   - *Implement an automated assignment strategy*

   - *Implement a manual assignment strategy* and *manually assign learners* to the cohorts you create

   - *Use a combination of automated and manual assignment*

3. Optionally, identify the discussion topics that you want to be divided by cohort.

   - Course-wide discussion topics are unified by default, but you can specify that they are *divided by cohort*.

   - Content-specific discussion topics are divided by cohort by default. You do not need to take any action if you want *all content-specific discussions* to be divided by cohort. You only need to change settings if you want to make *only a few discussion topics divided by cohort* and make the remaining topics unified.

You complete these procedures on the **Cohorts** tab on the Instructor Dashboard.

For an optimal learner experience, you should make sure that configuration of the cohort feature is as complete as possible before the start date of your course. If you need to make changes to the way you have configured cohorts while your course is running, be aware of the implications of your changes. For more information, see *Altering Cohort Configuration in a Running Course*.

9.2.2 Implementing an Automated Assignment Strategy

To implement an automated assignment strategy of learners to cohorts, you *enable the cohort feature* for your course, and *create cohorts* that have the **Automatic** *assignment method*. To add learners to these cohorts, you do not need to take any action: the system automatically and randomly assigns learners to the available automatic cohorts when they first access any course content or discussion topic.

Note: You can *add learners manually* to any cohort, whether it was created as an automated cohort or a manual cohort.

For a scenario using an automated assignment strategy, see *Automated Assignment: Making MOOC Discussions Manageable*. For a scenario using a combination of automated and manual assignment to cohorts, see *Hybrid Assignment: Accommodating Small Groups Within a Course*.

Automated Cohorts

The first time a learner views any course content, including the course **Discussion** page or content-specific discussion topics, if she is not already assigned to a cohort, she is randomly assigned to one of the automated cohorts. If no automated cohorts exist, the system creates a *Ensuring That All Learners Are Assigned: The Default Cohort* and assigns the learner to this default cohort.

Note: The default cohort is created to ensure that every learner is assigned to a cohort. To avoid having to re-assign learners from the default cohort to other cohorts, make sure you create the automated cohorts that you want before the course starts.

9.2.3 Implementing a Manual Assignment Strategy

To implement a manual assignment strategy of learners to cohorts, you *enable the cohort feature* for your course, and *create cohorts* that have the **Manual** *assignment method*. To add learners to these cohorts, you manually assign learners to the appropriate cohort.

Note: Manual assignments should be as complete as possible before your course starts. If enrollment continues after your course starts, you should continue to assign new learners to cohorts. If you need to make changes to the way you have configured cohorts while your course is running, see *Altering Cohort Configuration in a Running Course*.

For a scenario using a manual assignment strategy, see *Manual Assignment: Grouping by Common Characteristics*. For a scenario using a combination of automated and manual assignment to cohorts, see *Hybrid Assignment: Accommodating Small Groups Within a Course*.

9.2.4 Enabling Cohorts in your Course

To enable cohorts in your course, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Select **Enable Cohorts**.

You can now *add cohorts* to your course.

> **Warning:** Be very careful in deciding to enable the cohort feature in a live course, because doing so affects the course experience for learners. Learners might no longer have access to courseware and discussion topics that were previously visible to them.
> If you must make changes to cohort configuration while your course is running, be sure you understand the consequences of doing so. For details, see *Altering Cohort Configuration in a Running Course*.

9.2.5 Adding Cohorts

After you enable the cohorts feature for your course, you can add cohorts.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Click **Add Cohort**.

3. Enter a name for the cohort.

Note: Learners can see the name of the cohort they are assigned to. The message "This post is visible only to {cohort name}" appears with each post in discussion topics that are divided by cohort. See *Read the Cohort Indicator in Posts*.

---

4. Specify whether learners are automatically or manually assigned to this cohort.

5. Optionally, select **Select a Content Group** to associate the cohort with a *content group*. For information about creating cohort-specific courseware by associating cohorts with content groups, see *Creating Cohort-Specific Courseware*.

6. Select **Save**.

Continue implementing your cohort strategy by creating additional cohorts as applicable, and specifying the assignment method for each cohort.

Note: When your course starts, you must have at least one cohort in your course that has automatic assignment. If

---

you have not created at least one automated assignment cohort in the course by the time that the first learner accesses your course content, edX creates a default cohort to which learners are automatically assigned.

For details about adding learners to a cohort by uploading a .csv file, see *Assign Learners to Cohorts by Uploading a .csv File*.

For a report that includes the cohort assignment for every enrolled learner, review the learner profile information for your course. See *Download or View Student Data*.

Note: You cannot delete cohorts, but you can change their names or the way in which learners are assigned to them. If you need to make changes to the way you have configured cohorts while your course is running, see *Altering Cohort Configuration in a Running Course*.

9.2.6 Assign Learners to Cohorts Manually

Note: Manual assignments should be as complete as possible before your course starts. If enrollment continues after your course starts, you should continue to assign new learners to cohorts.

1. View the live version of your course. For example, in Studio click **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. Scroll to the **Cohort Management** section at the bottom.

4. From the **Select a cohort** list, select the cohort to which you want to manually assign students.

5. On the **Manage Students** tab, under **Add students to this cohort** enter the username or email address of a single student, or enter multiple usernames or addresses separated by commas or new lines. You can copy data from a .csv file of email addresses or usernames, and paste it into this field.

6. Select **Add Students**. The learners you added are assigned to the selected manual cohort. A message appears to indicate the number of learners who were added to the cohort. Because learners can belong to only one cohort, the message also indicates the number of learners whose assignment to another cohort was changed as a result of your adding them to another cohort using this procedure.

For a report that includes the cohort assignment for every enrolled learner, review the learner profile information for your course. See *Download or View Student Data*.

9.2.7 Assign Learners to Cohorts by Uploading a .csv File

In addition to assigning learners to cohorts by entering usernames or email addresses directly on the **Cohorts** page in the Instructor Dashboard, you can also upload a .csv file containing a list of learners and the cohorts that you want to assign them to.

Any assignments to cohorts that you specify in the .csv files you upload will overwrite or change existing cohort assignments. The configuration of your cohorts should be complete and stable before your course begins. You should also complete manual cohort assignments as soon as possible after any learner enrolls, including any enrollments that occur while your course is running. To understand the effects of changing cohort assignments after your course has started, see *Altering Cohort Configuration in a Running Course*.

Note: Be aware that the contents of the .csv file are processed row by row, from top to bottom, and each row is treated independently.

For example, if your .csv file contains conflicting information such as Student A being first assigned to Cohort 1, then later in the spreadsheet being assigned to Cohort 2, the end result of your .csv upload is that Student A is assigned

to Cohort 2. However, the upload results file will count Student A twice in the "Students Added" count: once when they are added to Cohort 1, and again when they are added to Cohort 2. Before submitting a file for upload, check it carefully for errors.

The requirements for the .csv file are summarized in this table.

Requirement	Notes
Valid .csv file	The file must be a properly formatted comma-separated values file: • The file extension is .csv. • Every row must have the same number of commas, whether or not there are values in each cell.
File size	The file size of .csv files for upload is limited to a maximum of 2MB.
UTF-8 encoded	You must save the file with UTF-8 encoding so that Unicode characters display correctly. See *Creating a Unicode-encoded .csv File*.
Header row	You must include a header row, with column names that exactly match those specified in "Columns" below.
One or two columns identifying students	You must include at least one column identifying students: either "email" or "username", or both. If both the username and an email address are provided for a student, the email address has precedence. In other words, if an email address is present, an incorrect or non- matching username is ignored.
One column identifying the cohort	You must include one column named "cohort" to identify the cohort to which you are assigning each student. The specified cohorts must already exist in Studio.
	Columns with headings other than "email", "username" and "cohort" are ignored.

Follow these steps to assign learners to cohorts by uploading a .csv file.

1. View the live version of your course. For example, in Studio, select **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. From the **Select a cohort** list, select the cohort to which you are adding students.

4. Select **Assign students to cohorts by uploading a CSV file**, then select **Browse** to navigate to the .csv file you want to upload.

5. Select **Upload File and Assign Students**. A status message is displayed above the **Browse** button.

6. Verify your upload results on the **Data Download** page.

   Under **Reports Available for Download**, locate the link to a .csv file with "cohort_results" and the date and time of your upload in the filename. The list of available reports is sorted chronologically, with the most recently generated files at the top.

The results file provides the following information:

Column	Description
Cohort	The name of the cohort to which you are assigning learners.
Exists	Whether the cohort was found in the system. TRUE/FALSE. If the cohort was not found (value is FALSE), no action is taken for students you assigned to that cohort in the .csv file.
Students Added	The number of learners added to the cohort during the row by row processing of the .csv file.
Students Not Found	A list of email addresses or usernames (if email addresses were not supplied) of learners who could not be matched by either email address or username and who were therefore not added to the cohort.

For a report that includes the cohort assignment for every enrolled learner, review the learner profile information for your course. See *Download or View Student Data*.

Creating a Unicode-encoded .csv File

Make sure the .csv files that you upload are encoded as UTF-8, so that any Unicode characters are correctly saved and displayed.

Note: Some spreadsheet applications (for example, MS Excel) do not allow you to specify encoding when you save a spreadsheet as a .csv file. To ensure that you are able to create a .csv file that is UTF-8 encoded, use a spreadsheet application such as Google Sheets, LibreOffice, or Apache OpenOffice.

9.2.8 Altering Cohort Configuration in a Running Course

The configuration of cohorts should be complete and stable before your course begins. Manual cohort assignments should be completed as soon as possible after any learner enrolls, including any enrollments that occur while your course is running.

If you decide that you must alter cohort configuration after your course starts and activity in the course discussion begins, be sure that you understand the consequences of these actions.

- *Change Student Cohort Assignments*
- *Rename a Cohort*
- *Delete a Cohort*
- *Changing the Assignment Method of a Cohort*
- *Disable Cohorts in Your Course*

9.2.9 Change Student Cohort Assignments

After your course starts and learners begin to contribute to the course discussion, each post that they add is visible either to everyone or to the members of a single cohort. When you change the cohort that a learner is assigned to, there are three results.

- The learner continues to see the posts that are visible to everyone.
- The learner sees the posts that are visible to his new cohort.
- The learner no longer sees the posts that are visible only to his original cohort.

The visibility of a post and its responses and comments does not change, even if the cohort assignment of its author changes. To a learner, it can seem that posts have "disappeared".

To verify the cohort assignments for your learners, download the *student profile report* for your course. If changes are needed, you can *assign learners* to different cohorts manually on the **Cohorts** page of the Instructor Dashboard, or *upload cohort assignment changes* in a .csv file.

9.2.10 Rename a Cohort

You can change the name of any cohort, including the system-created default cohort.

To rename a cohort, follow these steps.

1. View the live version of your course. For example, in Studio select **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. From the **Select a cohort** list, select the cohort whose name you want to change.

4. On the **Settings** tab, in the **Cohort Name** field, enter a new name for the cohort.

5. Select **Save**. The name for the cohort is updated throughout the LMS and the courseware, including learner-visible views.

Delete a Cohort

You cannot delete cohorts. However, you can *rename a cohort*, *change its assignment method*, or move learners to other cohorts.

If you decide that you must alter cohort configuration after your course starts and learners begin viewing the courseware and discussion topics, be sure that you understand the consequences of these actions. For more details, see *Altering Cohort Configuration in a Running Course*.

9.2.11 Changing the Assignment Method of a Cohort

Although you can change the assignment method of a cohort at any time after you create it, you should have a strategy in mind as you design your course, and only make changes to cohorts while the course is running if absolutely necessary. Be aware of the implications of changing cohort configuration while your course is running. For more information, see *Options for Assigning Learners to Cohorts* and *Altering Cohort Configuration in a Running Course*.

Note: When your course starts, you must have at least one cohort in your course that has automatic assignment. If you have not created at least one automated assignment cohort in the course by the time that the first learner accesses your course content, edX creates a default cohort to which learners are automatically assigned. If the *Default Group* is the only automated assignment cohort in your course, you cannot change its assignment method to **Manual**.

To change the assignment method of a cohort, follow these steps.

1. View the live version of your course. For example, in Studio select **View Live**.

2. Select **Instructor**, then select **Cohorts**.

3. From the **Select a cohort** list, select the cohort whose assignment method you want to change.

4. On the **Settings** tab, the current assignment method is selected. Change the assignment method by selecting the other option, either **Automatic** or **Manual**.

5. Select **Save**.

   The cohort assignment method is updated.

Note: Changing the cohort assignment method has no effect on learners who are already assigned to this and other cohorts. Learners who access the course after you make this change are assigned to cohorts based on the new assignment method of this cohort combined with the assignment methods of all other cohorts.

9.2.12 Disable Cohorts in Your Course

> **Warning:** Be very careful in deciding to disable the cohort feature if you previously had it enabled in a live course, because doing so affects the course experience for learners. Courseware and discussion posts that were shared only with members of particular cohorts are now visible to all learners in the course.
>
> If you must make changes to the way you have configured cohorts while your course is running, be sure you understand the consequences of doing so. For details, see *Altering Cohort Configuration in a Running Course*.

To disable cohorts in your course, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Clear the **Enable Cohorts** option.

All course content and discussion posts that were previously divided by cohort immediately become visible to all students.

9.3 Creating Cohort-Specific Courseware

This section provides information about setting up content for specific cohorts.

- *Overview*
- *Example: Cohort-Specific Courseware*
- *Content Groups*
- *Create Content Groups*
- *View Usage of a Content Group*
- *Delete Content Groups*
- *Specify Components in Courseware as Visible Only to Particular Content Groups*
- *Associate Cohorts with Content Groups*
- *Preview Cohort-Specific Courseware*

9.3.1 Overview

If you have *enabled cohorts* in your course, you can create different course experiences for learners in different cohorts.

You can design your course so that some learners are given different content than others. You do this by creating *content groups* in Studio, and designating specific components in your course as visible only to one or more content groups. Then, if you associate one or more cohorts with a content group, only the learners in cohorts associated with that content group can see course content that you have designated for it.

For more details about content groups, see *Content Groups*. For an example of cohort-specific course content, see *Example: Cohort-Specific Courseware*.

Complete these steps to create cohort-specific content in your course.

In Studio

---

1. *Enable cohorts in your course*.

2. *Create content groups*.

3. *Specify components in courseware as visible only to particular content groups*.

In the LMS

1. *Assign learners to cohorts*.

2. *Associate one or more cohorts with a content group*.

3. *Preview cohort-specific courseware*.

9.3.2 Example: Cohort-Specific Courseware

Suppose that you create two *cohorts* in your course: University Alumni and Current University Students. Learners who are not in either of these cohorts are automatically placed into a third cohort, the default cohort, when they access the courseware or discussion tabs in the course. For more information about enabling cohorts in your course and assigning students to cohorts, see *Enabling and Configuring the Cohorts Feature*.

You intend all learners to have substantially the same course experience, with the exception that only learners in the two university-related cohorts will receive content that is specific to your university and therefore only of interest to them.

At the end of every section, you intend to include a video message from various university officials, including the university president and the dean of your college. These videos will be shown only to learners in the university and alumni cohorts. Also at the end of each section, you intend to include a quiz to test knowledge of the concepts taught in that section. The quiz will be shown to all learners enrolled in the course.

To achieve this, on the **Group Configurations** page in Studio you create one content group called "University-Specific Content". In the Instructor Dashboard, on the **Cohorts** tab, you associate both the "University Alumni" and the "Current University Students" cohorts with the "University-Specific Content" content group.

Then, in your course outline, you change the visibility settings for the video component at the end of each section so that it is visible only to the "University-Specific Content" content group. You do not need to edit the visibility settings of the quiz component, because if no content group is specified in a component's visibility settings, it is visible to all learners.

As a final step, you preview the course in the LMS to ensure that learners see the content that is intended for them. You confirm that when you view the course in the role of **Student** (in other words, any learner not in a content group), you see a quiz at the end of each section, but do not see the university-related videos. When you view the course as a learner in the "University-Specific Content" group, you see a university-related video as well as the quiz at the end of each section.

9.3.3 Content Groups

Content groups are virtual groupings of learners who will see a particular set of course content. You can use content groups to designate specific course content as visible to particular *cohorts* of learners.

You create content groups in Studio, and in your course outline you use the **Visibility Settings** to designate whether a component is selectively visible only to one or more content groups. Any course components that do not have an explicitly restricted visibility setting remain visible to all students, regardless of their cohort.

Content groups do not have an actual impact on the visibility of a course component until you associate them with one or more cohorts. If you have designated certain course content as visible to a content group, and in addition have associated that content group with one or more cohorts, then those cohorts will see the designated content.

For an example of using content groups to create cohort-specific courseware, see *Example: Cohort-Specific Courseware*.

9.3.4 Create Content Groups

To create a content group, follow these steps.

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, select **New content group**.
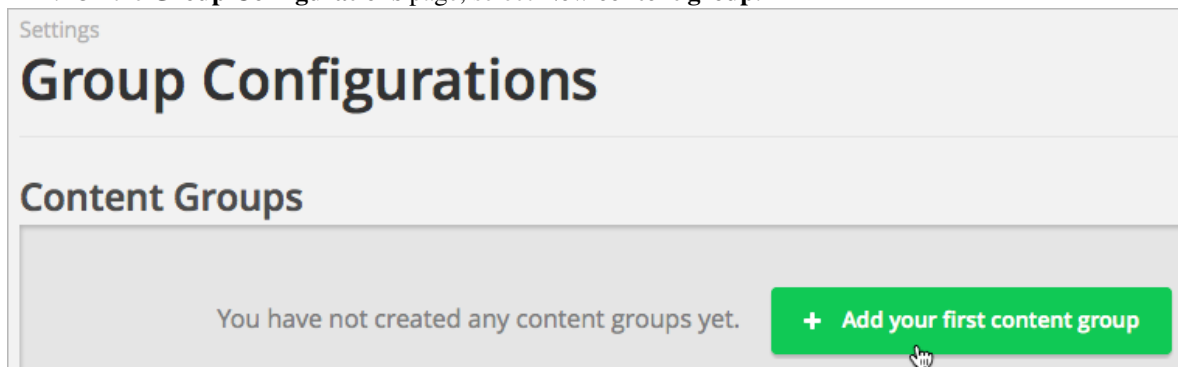
3. Enter a meaningful name for the content group, then select **Create**. The page refreshes to show the name of your new content group.

4. Repeat this step to create as many content groups as you want.

After you create a content group, you can work with your course outline to specify which components are visible to specific content groups. For details, see *Specify Components in Courseware as Visible Only to Particular Content Groups*.

On the Instructor Dashboard, you associate each content group with one or more cohorts. For details, see *Associate Cohorts with Content Groups*.

9.3.5 View Usage of a Content Group

To view the units that are visible to a content group, follow these steps.

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, locate the content group for which you want to view the usage.

   The content group's box displays whether the content group is used in this course. If it is used, you see the number of units that it is used in, and links to each unit.

3. Select each link to go to that unit in the **Course Outline**, where you can *specify whether that unit is visible to the content group*.

For details about previewing your course to ensure that learners in a cohort correctly see the content intended for them, see *Preview Cohort-Specific Courseware*. For details about deleting content groups, see *Delete Content Groups*.

9.3.6 Delete Content Groups

Note: You can delete a content group only if it is not in use in any course unit. To delete a content group that is currently in use, you must first remove it from any course unit visibility settings that use the content group. For information about seeing which units use a content group, see *View Usage of a Content Group*.

1. In Studio, select **Settings**, then select **Group Configurations**.

2. On the **Group Configurations** page, locate the content group that you want to delete.

3. Move your cursor over the content group's box, then select the **Delete** icon.

4. In the confirmation message, select **Delete** again to confirm the deletion.

9.3.7 Specify Components in Courseware as Visible Only to Particular Content Groups

After you create at least one content group, you can edit your course in Studio and modify the visibility settings of components that you want to make visible only to particular content groups.

Note: You do not need to edit the visibility settings of components that are intended for all learners. Components that you do not explicitly indicate as visible to a group are visible to all learners enrolled in your course, regardless of the cohort that they belong to.

You can specify content as visible to content groups only at the component level in a unit. You cannot specify entire units, subsections, or sections for visibility to content groups.

In a separate task, you create cohorts and associate content groups with cohorts. Then, only the cohorts associated with content groups which you selected in a component's visibility settings can view the component. See *Associate Cohorts with Content Groups* for details about associating cohorts with content groups.

To specify components as visible only to particular content groups, follow these steps.

1. In Studio, select **Content**, then select **Outline**.

2. For each component that you want to make visible only to a particular content group or groups, select the unit name, then select the **Visibility Settings** icon.
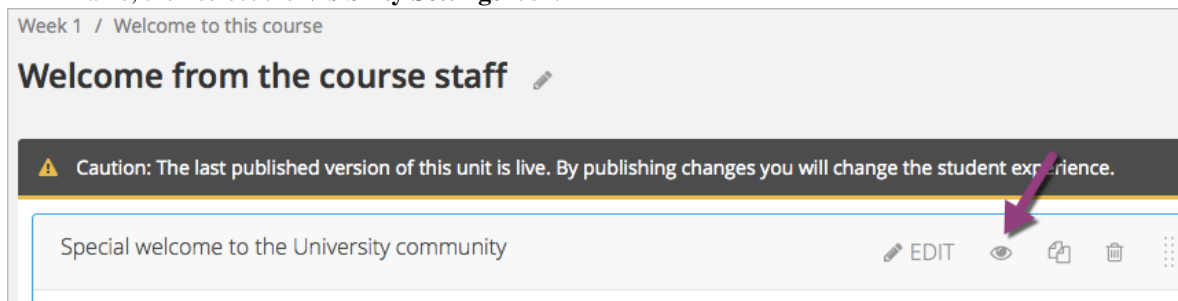
3. In the **Editing visibility** dialog, select **Specific Content Groups**, then select the checkbox for each content group for which you want the current component to be visible.

4. Select **Save**.

The **Visibility Settings** icon for the component is now black.

The publishing details for the course section in the sidebar indicate that some content is visible only to particular groups.

For details about previewing your course to ensure that students in a cohort correctly see the content intended for them, see *Preview Cohort-Specific Courseware*.

Note: In addition to visibility settings for content groups, a learner's ability to see a course component also depends on whether it is hidden from students, whether the unit is published, and the course's release date. For details about previewing courseware in general, see *Preview Course Content*.

9.3.8 Associate Cohorts with Content Groups

After you create a content group, you can associate it with one or more cohorts with which you want to share the same special content.

Note: A content group can be associated with more than one cohort; a cohort cannot be associated with more than one content group.

To associate a cohort with a content group, follow these steps:

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. From the cohorts drop down list, select the cohort to which you want to associate your content group.

3. Select the **Settings** tab for the selected cohort.

4. Under **Associated Content Group**, choose the **Select a Content Group** option.

5. From the content group drop down list, select the content group that you want your cohort to be associated with.

6. Select **Save**.

> You have now associated your content group with a cohort. Any course content that you *designate as visible to that content group* is visible to students in the associated cohort or cohorts.

You can associate additional cohorts with the same or a different content group by repeating steps 3 to 7.

For an example of using content groups to create cohort-specific courseware, see *Example: Cohort-Specific Courseware*.

9.3.9 Preview Cohort-Specific Courseware

After you designate components as being visible only to certain content groups, you can preview your courseware to ensure that each group correctly sees the content intended for them.

Note: In addition to visibility settings for content groups, a learner's ability to see a course component also depends on whether it is hidden from students, whether the unit is published, and the course's release date. For details about previewing courseware in general, see *Preview Course Content*.

You can view the course as a member of these groups.

Role	When You "View As" This Role
Staff	You see all content in the course, including content that is hidden from learners.
Student	You see any content that is intended for all students.
Specific Student	You see content that is intended for the student whose email or username you specify.
Student in <Content Group Name>	You see content that is intended for all learners, as well as any content specifically set to be visible to this content group.

1. In Studio, in the course outline, select **Preview**. You see your course section in the **Courseware** section of the LMS.

2. In the navigation bar at the top of the page, select one of the options in the **View this course as** drop down list, as described in the table above.
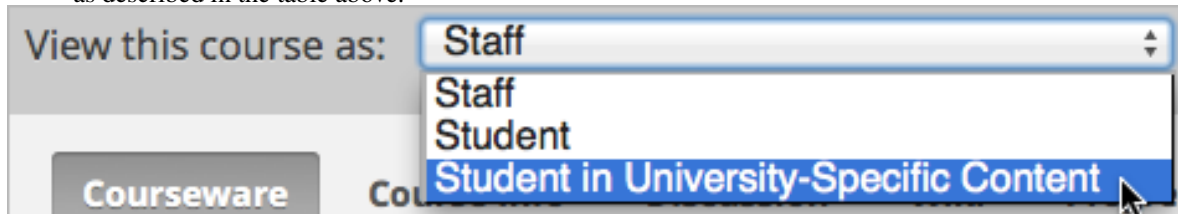
The course view refreshes and the content is presented as a member of the selected content group would see it.

After your course is live, you can also see the live version as a learner would see it, by selecting **View Live** from Studio. For more information, see *View Your Live Course*.

9.4 Setting up Discussions in Courses with Cohorts

This section provides information about setting up discussions for specific cohorts.

- *Overview*
- *Course-Wide Discussion Topics and Cohorts*
- *Specify Whether Course-Wide Discussion Topics are Divided by Cohort*
- *Content-Specific Discussion Topics and Cohorts*
- *Specify that All Content-Specific Discussion Topics are Cohorted*
- *Specify that Some Content-Specific Discussion Topics are Divided by Cohort*

9.4.1 Overview

In courses that have cohorts enabled, discussion topics can be either divided by cohort, or unified and accessible to all learners.

Discussion topics that are divided by cohort are visible to all learners but the posts, responses, and comments within them are divided so that they are visible only to members of the same cohort. Posts, responses, and comments within unified discussion topics are visible to all learners in the course, regardless of cohort.

When you first enable cohorts in your course, the initial behavior for *course-wide discussion topics* is different from the behavior of *content-specific discussion topics*.

By default, course-wide discussion topics are unified because these discussions are generally used for posts that are of broad interest to all learners in the course. In contrast, content-specific discussion topics are by default divided by cohort. On the Instructor Dashboard, you can change discussion topics of either type to be divided or unified.

> **Warning:** If you change the cohort settings of discussion topics in a live course after learners have begun reading and contributing to discussion posts, you are changing their course experience. Learners might see posts that were previously not visible to them, or they might no longer see posts that were previously available to all learners. If you make changes to cohort settings in a running course, be aware of the implications of your changes. For more details, see *Altering Cohort Configuration in a Running Course*.

For information about cohort settings for discussion topics, see the following topics.

- *Course-Wide Discussion Topics and Cohorts*

- *Specify Whether Course-Wide Discussion Topics are Divided by Cohort*

- *Content-Specific Discussion Topics and Cohorts*

- *Specify that All Content-Specific Discussion Topics are Cohorted*

- *Specify that Some Content-Specific Discussion Topics are Divided by Cohort*

For overview information about discussions in a course, see *Managing Course Discussions*. For information about using cohorts in a course and managing discussions that are divided by cohort, see *Using Cohorts in Your Courses* and *Managing Discussions in Courses with Learner Cohorts*.

Note: Making discussion topics divided by cohort, described in this and the following topics, only divides posts within the discussion topics by cohort; the discussion topics are still visible to all learners in the course. If you want to make specific content-specific discussion topics visible only to certain cohorts, you can implement content groups and change the visibility settings on the discussion components. For more details, see *Creating Cohort-Specific Courseware*.

9.4.2 Course-Wide Discussion Topics and Cohorts

When you first *create a course-wide discussion topic*, it is unified, and all learners in the course can post, read, respond, and comment in the topic without regard to their cohort assignments.

After you add a course-wide topic, you can configure it so that it is divided by cohort instead. For step-by-step instructions for specifying whether a course-wide discussion topic is unified or divided by cohort, see *Specify Whether Course-Wide Discussion Topics are Divided by Cohort*.

Example: Making Some Course-Wide Discussion Topics Divided by Cohort

Course-wide discussion topics are by default unified, so that all learners can participate. In some instances, however, you might decide that it makes sense to divide some course-wide discussion topics by cohort, so that members of each cohort only see and respond to posts made by learners in the same cohort.

For example, in addition to the system-supplied General topic, you add three new course-wide discussion topics, for a total of four discussion topics.

- General

- Course Q&A

- Announcements

- Brainstorming

The posts that you intend to make to the General and Course Q&A topics, and the subjects you expect learners to explore there, are appropriate for a unified learner audience.

However, you decide that it will be useful for the Announcements and Brainstorming topics to be divided by cohort. For information about specifying whether course-wide discussion topics are divided by cohort, see *Specify Whether Course-Wide Discussion Topics are Divided by Cohort*.

You also decide to apply a naming convention so that learners will know the audience for the discussion topics before they add any posts. For information about naming conventions, see *Apply Naming Conventions to Discussion Topics*.
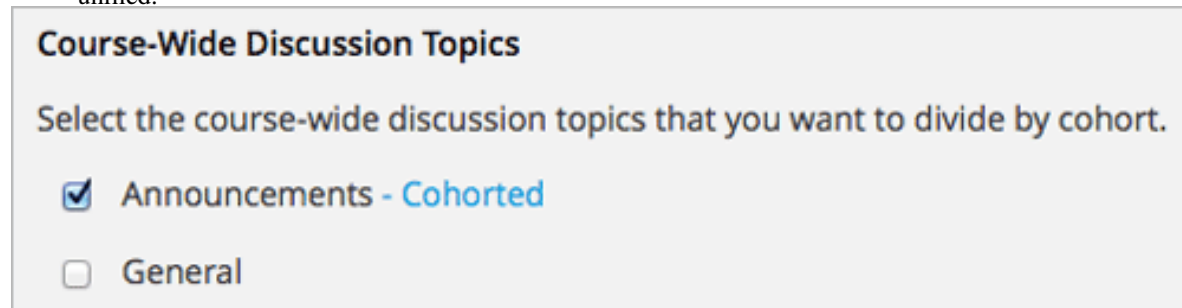
9.4.3 Specify Whether Course-Wide Discussion Topics are Divided by Cohort

When you *create course-wide discussion topics*, they are by default unified, and all learners in the course can see and respond to posts from all other learners. You can change course-wide discussion topics to be divided by cohort, so that only members of the same cohort can see and respond to each other's posts.

To change the cohort settings for course-wide discussion topics, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Select **Specify whether discussion topics are divided by cohort**.

3. In the **Course-Wide Discussion Topics** section, select the checkbox next to each course-wide discussion topic that you want to divide by cohort. Clear the checkbox next to each course-wide discussion topic that you want to make unified.

4. Select **Save**.

   The list of course-wide discussion topics is updated to show which topics are divided by cohort, and which are unified.

For more information about managing discussions that are divided by cohort, see *Managing Discussions in Courses with Learner Cohorts*.

9.4.4 Content-Specific Discussion Topics and Cohorts

When you enable the cohort feature for a course, and *create content-specific discussion topics* by adding discussion components to units in Studio, these content-specific discussion topics are by default divided by cohort. A learner who is assigned to one cohort cannot read or add to the posts, responses, or comments contributed by the members of another cohort.

If you want all content-specific discussion topics in your course to be divided by cohort, you do not need to take any action. For more information, see *Specify that All Content-Specific Discussion Topics are Cohorted*.

Alternatively, you can specify that you want most of the content-specific discussion topics in your course to be unified, and make *only a few discussion topics divided by cohort*.

9.4.5 Specify that All Content-Specific Discussion Topics are Cohorted

The default behavior for content-specific discussion topics is that they are divided by cohort when you first *add them* in your courseware. If you want all content-specific discussion topics in your course to be divided by cohort, you do not need to take any action.

You can confirm this setting on the Instructor Dashboard **Cohorts** tab.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Select **Specify whether discussion topics are divided by cohort**.

In the **Content-Specific Discussion Topics** section, you see that the **Always cohort content-specific discussion topics** option is selected.

All content-specific discussion topics in your course are divided by cohort, and you cannot change the cohort settings of individual content-specific discussion topics.

For information about changing the cohort settings for your content-specific discussions to make all of them unified except a few, see *Specify that Some Content-Specific Discussion Topics are Divided by Cohort*.

9.4.6 Specify that Some Content-Specific Discussion Topics are Divided by Cohort

The default behavior for content-specific discussion topics is that they are divided by cohort when you first *add them* in your courseware.

To make only a few of your content-specific discussion topics divided by cohort, you change the cohort settings for content-specific discussion topics to make them all unified, and then explicitly select only the topics that you want to be divided by cohort.

> **Warning:** When you change the cohort setting from **Always Cohort Content- Specific Discussion Topics** to **Cohort Selected Content-Specific Discussion Topics**, you are making all content-specific discussion topics in your course unified, unless you explicitly change them to be divided by cohort before saving your changes. This means that any posts that were previously divided by cohort and restricted to viewing, responding, and commenting by members of the same cohort are now visible to all learners in your course.
>
> If you make changes to cohort settings in a running course, be aware of the implications of your changes. For more details, see *Altering Cohort Configuration in a Running Course*.

To specify that only some content-specific discussion topics in your course are divided by cohort, follow these steps.

1. In the LMS, select **Instructor**, then select **Cohorts**.

2. Select **Specify whether discussion topics are divided by cohort**.

3. In the **Content-Specific Discussion Topics** section, if it is not already selected, select **Cohort selected content-specific discussion topics**.

> **Warning:** If you make changes to cohort settings in a running course, be aware of the implications of your changes. For more details, see *Altering Cohort Configuration in a Running Course*.

   All content-specific discussion topics that you add in your course are unified and visible to all learners. The list of content-specific discussion topics becomes editable.

4. Select the checkbox next to each content-specific discussion topic that you want to divide by cohort.

5. Select **Save**.

   The changes to your content-specific discussions are saved. The content-specific discussion topics that you selected are saved as being divided by cohort. All other content-specific discussion topics are unified.

For more information about managing discussions that are divided by cohort, see *Managing Discussions in Courses with Learner Cohorts*.

9.5 Managing Discussions in Courses with Learner Cohorts

This section provides information about managing discussions when cohorts are enabled in your course.

- *Overview*
- *Identifying Who Can Read a Post*
- *Choosing the Visibility of a Post*
- *Viewing the Posts of a Cohort*

9.5.1 Overview

In courses that have cohorts enabled, every post has an indicator of who can read it: either all learners, or only the members of a single cohort. For learners, this is the only noticeable difference between discussions in courses that include cohorts when compared to courses that do not.

You can share the examples in the *Read the Cohort Indicator in Posts* section with your learners, along with the *Participating in Course Discussions* section of this guide.

Course team members who have the discussion admin, discussion moderator, or community TA role see the same indicator of who can read each post. Unlike the learners, however, team members with discussion privileges can read and contribute to every post, regardless of the cohort assignment of the learner who posted it.

Note: Course team members must have the Discussion Moderator or Discussion Admin role in addition to the Staff or Admin role to be able to view posts that are divided by cohort. For information about assigning discussion moderation roles, see *Assign Discussion Administration Roles*.

Learners who have the Community TA role can read and contribute to all posts.

In courses with the cohort feature enabled, course team members who have discussion moderator or admin privileges can also:

- Choose who will be able to see the posts that they add to divided topics. See *Choosing the Visibility of a Post*.

- Filter the posts that are listed on the **Discussion** page by cohort. See *Viewing the Posts of a Cohort*.

All of the other options and features described in the *Managing Course Discussions* section continue to be available to the discussion moderation team.

9.5.2 Identifying Who Can Read a Post

In a course that includes cohorts, all posts include a cohort indicator above the title. This indicator appears after any student or team member adds a post. Other than naming the cohorts carefully when you add them, no configuration is necessary to include this identifier.

Optionally, you can name your discussion topics to show students who will be able to view their posts. See *Apply Naming Conventions to Discussion Topics*.

Read the Cohort Indicator in Posts

Every post includes a sentence that identifies whether everyone can see and contribute to it, or only the members of a cohort in the course. Examples follow.
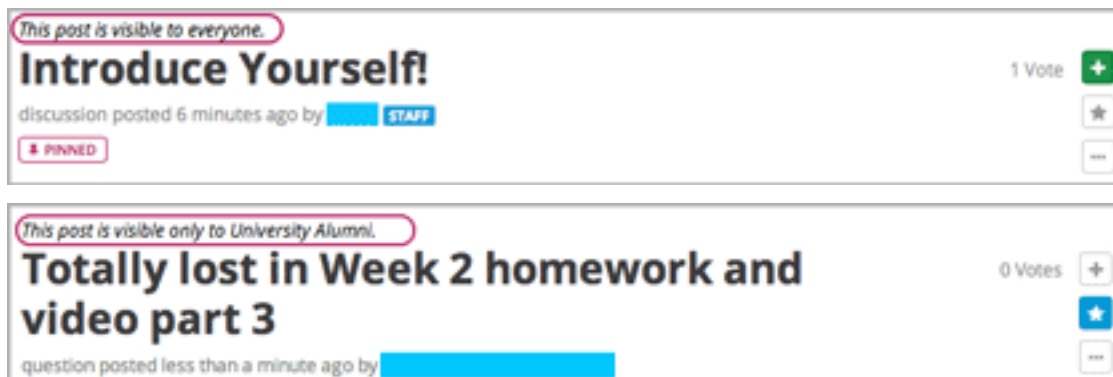
You see this identifier after you add your post. All of the responses and comments that other contributors add to a post are visible to the same group of people as the post itself.

Apply Naming Conventions to Discussion Topics

Optionally, course team members can give learners the audience context of their posts before they add them. Indicating who will be able to read posts in the names of the topics themselves can be useful when a cohort is particularly sensitive about the privacy of their conversations.

For example, you add "(everyone)" to the names of the unified course-wide discussion topics in your course.
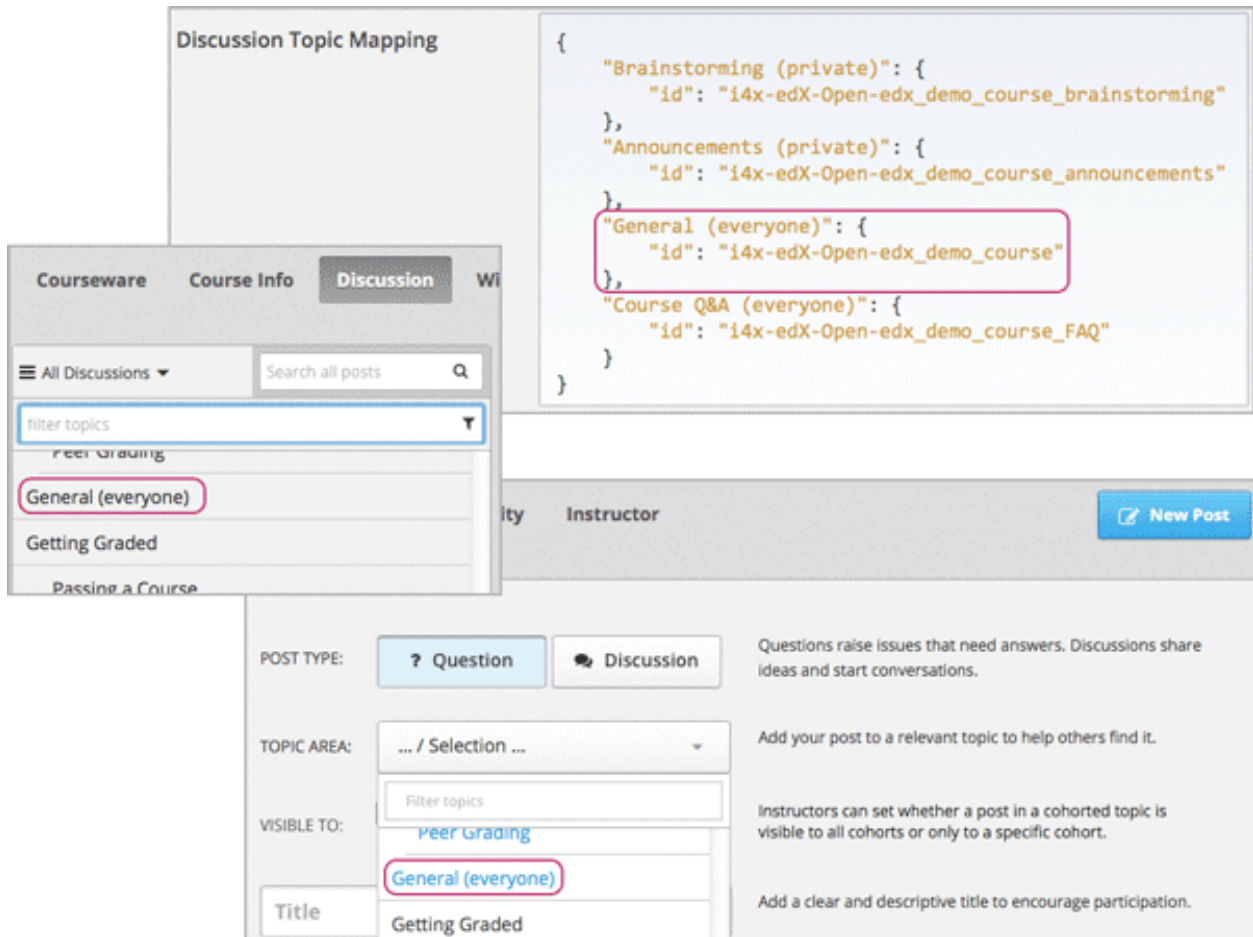
When learners visit the **Discussion** page and use dropdown lists to select a course-wide topic, the topic names indicate who can see the posts, responses, and comments.

(In the illustration above, every topic name includes either "(everyone)" or "(private)". You might find it necessary only to explicitly identify topics that have a unified audience for all posts.)

For more information about adding and configuring course-wide discussion topics, see *Create Course-Wide Discussion Topics* and *Specify Whether Course-Wide Discussion Topics are Divided by Cohort*.

If desired, you could also apply a naming convention to the content-specific discussion topics that you add as Discussion components in Studio. For example, you could include an identifier like "(private)" or "(small group)" in the **Subcategory** name of every Discussion component that you add.
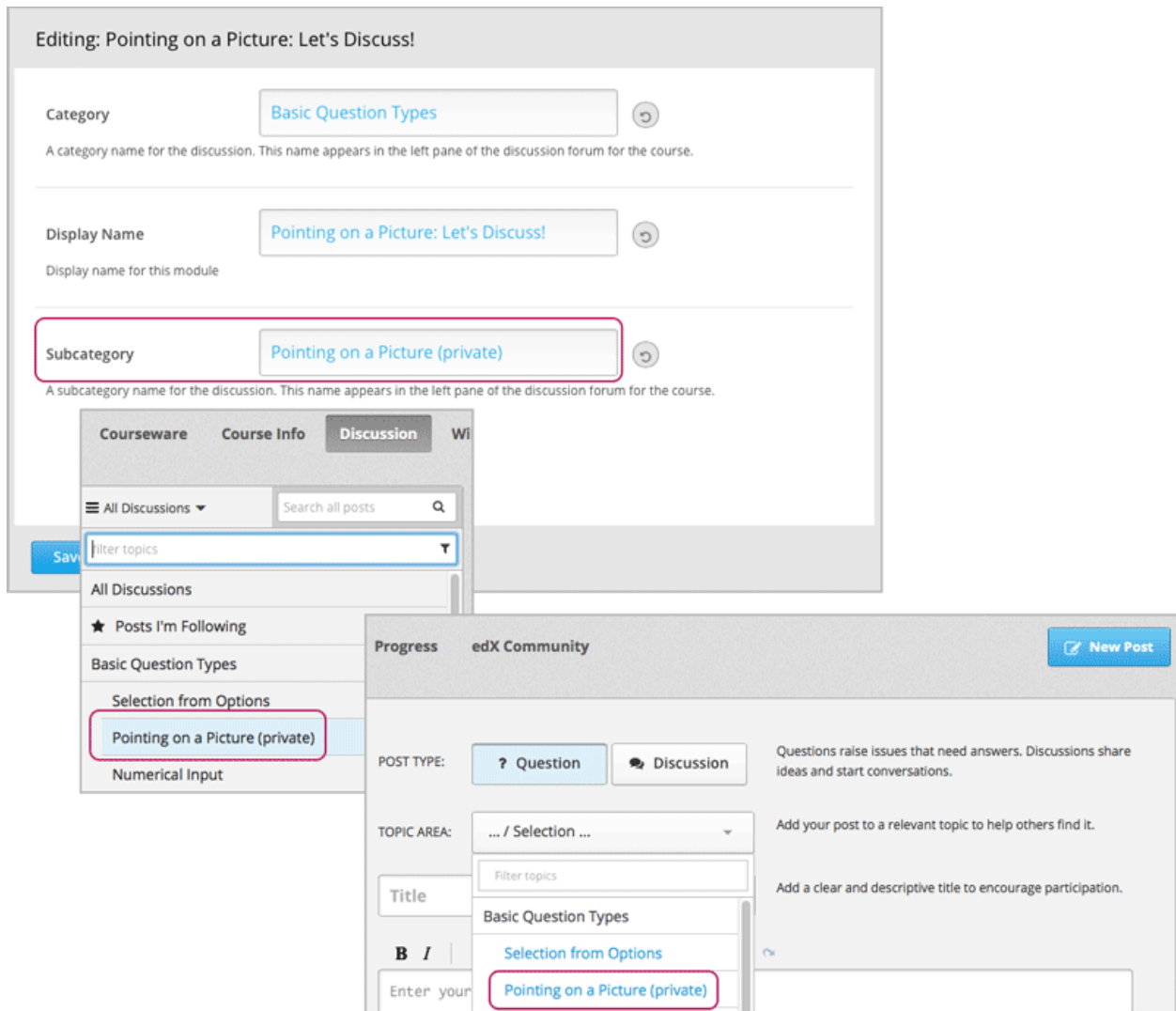
9.5.3 Choosing the Visibility of a Post

If you have the discussion admin, discussion moderator, or community TA role, you can make posts to divided discussion topics visible to everyone who is enrolled in the course or to the members of a selected cohort only. When you *add a post*, the **Visible to** dropdown list appears above the **Title** field.

This example shows a new post being added to a content-specific discussion topic.

As a discussion team member, you can choose the visibility of your posts in topics that are divided by cohort. This means that you can add a single post with information that you want everyone to see, rather than having to write a separate post for each cohort. It also means that it is possible for you to unintentionally share information with a different audience than you intended.

Note: Learners do not choose the visibility of their posts. The visibility of learner posts is determined by the configuration of the topic they post in. See *Identifying Who Can Read a Post*.

Posts that discussion team members add to unified discussion topics are always visible to all students, regardless of cohort assignment.

Considerations When Editing Posts

It may be helpful to keep these additional considerations in mind when you edit posts in a course that includes cohorts.

- You cannot change the visibility of a post after it has been added. If you notice that a post contains information that is not appropriate for the cohort who can read it, edit the content of the post or delete the post.

- If you change the topic that a post appears in, the visibility of the post and its responses and comments **does not change**. This ensures that learners who are following the post, or who have contributed responses or comments to it, will still be able to read it.

- All of the responses and comments that are contributed to a post will be visible to the same group of people as the post itself. You cannot change the visibility of individual responses or comments.

9.5.4 Viewing the Posts of a Cohort

When a course includes learner cohorts, you can view posts and monitor discussion activity for one cohort at a time. You can also view all posts.

Note: Course team members must have discussion moderator or admin privileges in addition to their course team privileges to be able to view posts that are divided by cohort.

Above the list of posts on the **Discussion** page, the **in all cohorts** filter is selected by default. You see every post when you make this selection, as shown in the illustration on the left. To limit the list so that you can view the same set of posts as the members of a cohort, select the name of that cohort as shown on the right.
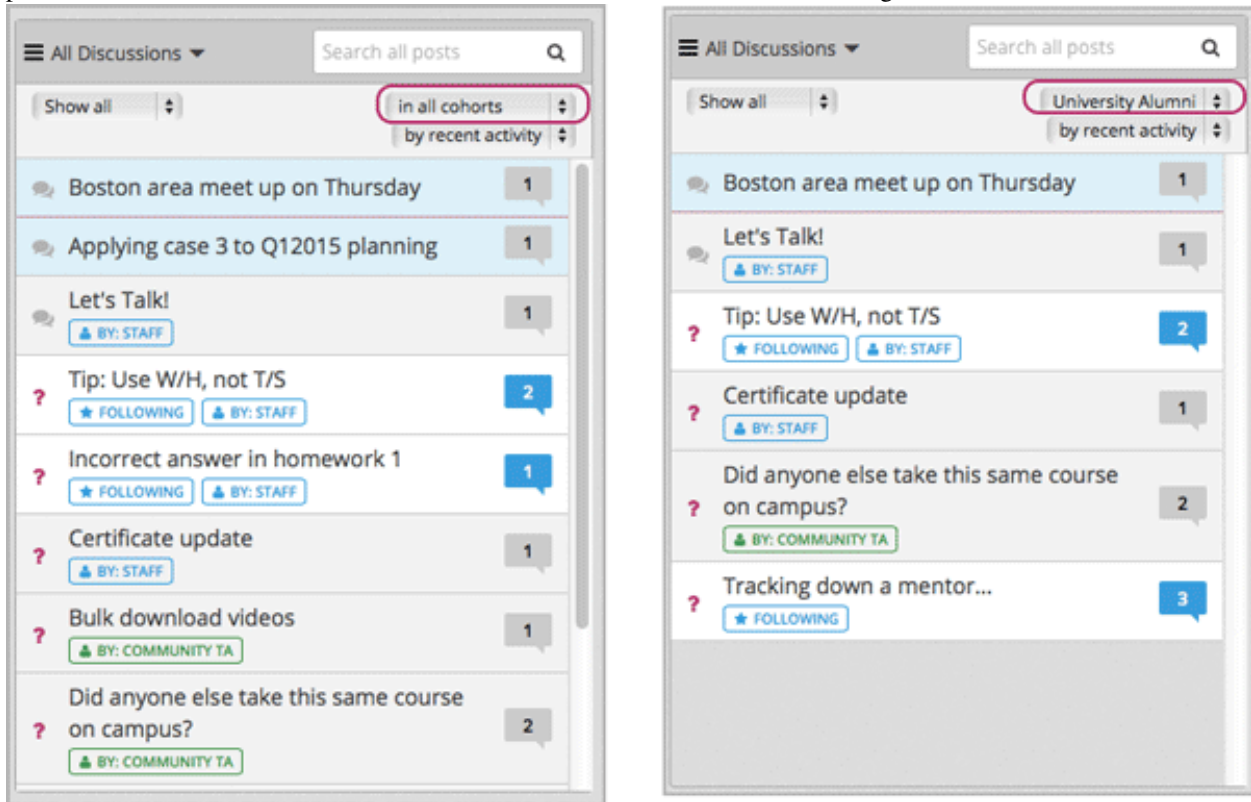
Note that both of these lists include posts that are visible to everyone. When you filter the list by cohort, you see the same, complete set of posts that the members of the cohort see.

For other options that you can use to view posts, see *Find Posts*.

Releasing Your Course

10.1 Beta Testing a Course

When a course is being designed in Studio, the course team can choose **View Live** to assess their progress in designing the course, test their work, find gaps and errors, and mimic the student experience. To gather information about the overall experience of taking a course, you can also conduct a beta test of the course.

- *The Beta Testing Process*
- *The Beta Testing Role*
- *What to Test*
- *How Beta Testers See Course Content*
- *Adding Beta Testers*
- *Add Multiple Beta Testers*
- *Reporting Issues During a Course*

10.1.1 The Beta Testing Process

During a beta test, you gather information about the experience of taking your course in an effort to improve its quality. The phases of the beta testing process, and some questions that you may find useful to consider as you prepare for each phase, follow.

1. **Planning**: What are your objectives for the test? What is the schedule for testing?

2. **Recruitment**: How many testers do you need? How much time do you expect testers to spend? When do you need them to complete their feedback?

3. **Provide access to your course**: Can testers access your entire course immediately, or are its sections and subsections available at different times? How will that affect the schedule?

4. **Collect feedback**: How do you want testers to provide feedback? Who checks for feedback, and how often?

5. **Evaluate feedback**: How is feedback evaluated? Who decides what changes to make as a result, and on what schedule?

6. **Conclusion**: How do you acknowledge the efforts of your testers? What do you share with them about the results of their efforts?

There is no one answer to any of these questions. They are included here as background on the role that beta testing can play in the preparation of your course.

10.1.2 The Beta Testing Role

Beta testers have early access to the course. Beta testers are not members of the course team: they do not have information about "how it is supposed to work". They use their own computers and Internet connections to view videos, follow links, and complete problems. They interact with the course as students will to find, and make, mistakes.

However, beta testers are not the same as other students in the course, either. They have privileged access to the course and have more time to review and complete the course materials than the enrolled students do. Course discussions are not open before the course start date, so beta testers cannot participate in community conversations. As a result of these differences, beta testers do not receive certificates when they complete a course.

Note: If one of your beta testers wishes to earn a certificate for the course, she must create a separate user account with a different username and email address. She can then use that separate, non-privileged user account to enroll in the course and repeat the work, completing assignments and exams when they are available to all students.

Qualities of Good Beta Testers

A beta test is valuable in part because it is unscripted. Your beta testers are not following a predetermined series of steps, or using a particular computer environment, when they access your course. When you recruit beta testers, however, you may find these skills and characteristics to be helpful.

- Curiosity.

- Attention to detail for identifying problems and inconsistencies.

- Solid communication skills for reporting problems to the course team.

Your beta testers should also have varying levels of knowledge about the course content:

- To recognize when material is wrong or missing, at least one tester should know the content well.

- To identify material that is unclear, at least one tester should be less familiar with the content.

Depending on the objectives you set for your beta test, you might want to consider recruiting testers who use assistive technologies, who have different native languages, or who have varying levels of familiarity with computer software.

Using Course Team Members as Beta Testers

The course team can provide valuable feedback about your course. However, they are typically stakeholders in the success of your course and have a significant amount of knowledge about it. As a result, they can be too close to the course to interact with it in the same way as students will. They can also be either reluctant to provide feedback, or overly zealous.

If you do want a team member to be a beta tester, note that the privileges of the Staff or Admin role override those of a beta tester. The team member must use a different, second email address to create an additional edX account and enroll in the course, and the course team must assign only the beta tester role to that edX account. The course team member experiences the course as a learner only when she signs in to edX using the beta tester account.

10.1.3 What to Test

Beta testers should interact with everything in the course.

- Click all links.

- Watch all videos.

- Download video transcripts and other files.

- Complete all problems.

Beta testers can use a desktop computer to access an edX website, the edX mobile app on a smartphone, or both to complete their tests. As they work, beta testers log issues and questions for the course team.

10.1.4 How Beta Testers See Course Content

To beta test a course, you:

- Define a number of days before section and subsection release days for testing to begin.

- Identify beta testers.

Designated beta testers see course content before students can. The matrix that follows shows the course content that beta testers can access earlier than other students.

	Yes	No
Before the Course Enrollment Date	X	
Before the Course Start Date	X	
Before the section Release Day	X	
Before the subsection Release Day	X	
Before the unit is Published		X
Before a draft replaces a live unit		X

The course team can continue to add content in Studio after the beta test begins. When new content is ready for testing, be sure to *publish the unit*.

Important: When you set up the beta test and define when it starts, verify that the first section, subsection, and unit in your course are available to be tested. If that first unit is not available, an error occurs when testers attempt to access any other content in the course.

Define When the Beta Test Starts

To define the start of the beta test, you use Studio to specify a number of days before the release day that is defined for each section and subsection in your course.

1. In Studio, from the **Settings** menu select **Advanced Settings**.

2. In the field for the **Days Early for Beta Users** policy key, enter the number of days before each section and subsection release day for beta testers to have access.

3. Click **Save Changes**.

Example

Beta tester access to courseware for a course with **Days Early for Beta Users** = 20 and 2 sections:

Course Enrollment Date = 31 August	31 August; earlier if enrolled by course team
Course Start Date = 15 September	26 August
section 1 Release Day = 15 September	26 August
section 2 Release Day = 22 September	2 September
subsection 1 Release Day = 22 September	2 September
subsection 2 Release Day = 24 September	4 September
subsection 2, unit 1 Visibility = Public	4 September
subsection 2, unit 2 Visibility = Public; draft in progress	4 September for Public version; No access to draft
subsection 2, unit 3 Visibility = Private	No access

In this example, the beta testers cannot access all of the courseware when the beta test starts on 26 August: they can access section 1 but not section 2. You may want to provide a schedule of section availability to your testers so that they can plan their time appropriately. Future release dates do not display to the beta testers in the courseware.

10.1.5 Adding Beta Testers

Before you can add beta testers:

- You need the email address or username of each beta tester.

- Each beta tester must register and activate a user account for that email address/username.

When you add beta testers, note the following.

- If the beta test starts before the course **Enrollment Start Date**, testers cannot enroll themselves in your course. However, you can enroll the beta testers prior to the **Enrollment Start Date**.

- If you add the beta testers after the defined start of the beta test, and they are enrolled in the course, they see your course on their **Current Courses** dashboards when they log in.

- If you add beta testers before the test starts, or if they are not enrolled, they do not see your course on their dashboards. You can enroll the beta testers in the course yourself, and you may want to send an email message to remind them when the test begins.

Add Multiple Beta Testers

If you have a number of beta testers that you want to add, you can use the "batch add" option to add them all at once, rather than individually. With this feature, you have options to enroll the beta testers in the course (before or after the **Enrollment Start Date**) and send an email message to notify the beta testers that they have been added.

To add multiple beta testers:

1. View the live version of your course.

2. Click **Instructor**, and then click **Membership**.

3. In the **Batch Beta Tester Addition** section of the page, enter one or more addresses or usernames separated by commas or line feeds (the Enter key). You can also copy data from a CSV file of email addresses and paste it here.

4. To enroll the beta testers in your course, leave **Auto Enroll** selected. If the beta test starts before the course **Enrollment Start Date**, testers cannot enroll themselves in your course.

5. To send an email message to the beta testers, leave **Notify users by email** selected. An example of the message that is sent to a beta tester who is not enrolled in the course follows.

Dear twobeta

You have been invited to be a beta tester for ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ at edge.edx.org by a member of the course staff.

Visit https://edge.edx.org/courses/▓▓▓▓▓▓▓▓▓▓▓▓▓▓/about to join the course and begin the beta test.

6. Click **Add beta testers**.

To remove the Beta Tester role from one or more users, enter their email addresses in the **Batch Add Beta Testers** field and then click **Remove beta testers**.

Note: The **Auto Enroll** option has no effect when you click **Remove beta testers**. The user's role as a beta tester is removed; course enrollment is not affected.

Add Beta Testers Individually

To add a single beta tester:

1. View the live version of your course.

2. Click **Instructor** then **Membership**.

3. In the **Administration List Management** section, use the drop-down list to select **Beta Testers**.

4. Under the list of users who currently have that role, enter an email address or username and click **Add Beta Tester**.

   If the beta test starts before the **Enrollment Start Date** of your course, you can also enroll the beta tester. See *Enrollment*.

To remove the Beta Tester role from users individually, find the user in the list of beta testers, and then click **Revoke access** to the right of that user's email address.

10.1.6 Reporting Issues During a Course

Despite the efforts of the course team and the beta testers, additional problems, questions, and issues can occur while a course is running.

- Often, students report issues by asking questions in a discussion. Your discussion moderation team can watch for posts that indicate problems.

- To let students know the best way to report problems, you can post information on the **Course Info** page or post it in a discussion.

10.2 Course Launching Activities

To launch a course, you prepare the course itself, the staff, and the students. This section includes a *course launch checklist* that you can use as a model for your schedule of activities.

To help you communicate to the course team or to all course participants before the course launches and while it is running, you can send email messages from the Instructor Dashboard. See *Bulk Email*. The section on bulk email also includes a set of *example messages to students* that you can use as guidelines when you write your own email messages.

10.2.1 Course Launch Checklist

As the start date for your course approaches, a checklist or time line of activities can help you make sure that your course, and your students, are ready to begin. Suggestions for activities to complete before your course starts follow.

Verify Course Settings

- Check the course start date and time in Studio. See *Setting Start and End Dates*.

- Review the grading policy, and set a grace period for homework assignment due dates. See *Establishing a Grading Policy*.

- Confirm that any optional features that you want your course to include, such as student cohorts, are enabled and configured. See *Using Cohorts in Your Courses*.

Verify Certificates

- Make sure that certificates are correctly configured and ready to be issued. See *Setting Up Course Certificates*.

Review First Week Content

- Verify that all units are present and published. See *Developing Course Units*.

- Verify that videos, transcripts, and download links are in place and working.

- Check all assignments for completeness and verify their due dates. See *Working with Problem Components*.

- Use edX Insights to review the answers that beta testers submitted for problems, and to proofread your display names, accessible labels, and answer text.

- Review feedback from the course team and beta testers to be sure that the content has been thoroughly reviewed and tested.

Welcome Students

- Two months before the course start date, prepare and send a welcome email message to currently enrolled students. See *Pre-launch Reminder* and *Send Email Messages to Course Participants*.

- Compose a welcome message and add it to the **Course Info** page. See *Add a Course Update*.

- Verify that a syllabus and other references are available on the **Course Handouts** page. See *Identify a Course Handout*.

- One month before the course start date, prepare and send a welcome email message to currently enrolled students.

- One week before the course start date, prepare and send a welcome email message to currently enrolled students.

- Add an "Introduce Yourself" post to a discussion topic. For a MOOC, you may want to manage the size of the thread by distributing student responses across multiple threads. For example, you can start different threads for introductions based on geographical location, such as "Introduce Yourself: Europe", "Introduce Yourself: North America", etc. See *Run a Discussion*.

- On the course start date, prepare and send a launch email message to currently enrolled students. See *Launch Day Welcome*.

Prepare the Course Team

- Define communication methods for all course contributors, including team members with the Staff, Admin, and discussion moderation team roles. For example, set up a course-specific email address.

- Verify that all course contributors know how to record their work, report issues, and collaborate on tasks.

- Verify that the admins and staff selected for your course have the correct role assignments in the LMS. See *Staffing*.

- Verify that the people you have given the Discussion Admin, Discussion Moderator, and Discussion Community TA roles have registered and activated their user accounts and enrolled in the course. See *Assign Discussion Administration Roles*. Note that team members with the Admin and Staff roles must also be given one of these roles to have discussion moderation privileges.

- Define methods for managing discussions and guidance for discussion moderators, and distribute to the discussion team. See *Moderate Discussions* and *Guidance for Discussion Moderators*.

10.3 Staff Debug Info

The edX system keeps track of students' progress through a course – recording when the student watches videos, responds to problems, and so on. If you are a member of a course team, some of that data is visible to you for debugging purposes. Under every problem is a **Staff Debug Info** button: clicking this button opens a popup with metadata about the problem.

None of this information should be necessary for day-to-day usage of edX, but for the sake of clarity, some of these fields are documented here:

is_released Indicates whether the problem is visible to students.

location An internal unique identifier that corresponds to this problem. If you are having trouble with a problem, and need assistance from the edX support team, including this value will make it easier for them to track down the issue you're having with the problem.

markdown The text of the problem, in Markdown format. This is often written using Studio.

display_name The name of the problem, as shown to the student.

max_attempts The maximum number of times that a student can attempt to answer the problem correctly.

attempts The number of times that the currently logged in student has attempted to answer the problem correctly, so far. Every time this student attempts to answer this question, this number will go up, until it reaches `max_attempts`.

Running Your Course

11.1 Staffing

You can designate a team of people to help you run your course. Two roles are available to give team members access to additional options for working with students, grades, and other members of the staff.

- Staff

- Admin

You can assign these privileged roles when you work in either the LMS or Studio. The people who have these roles can work on your course in Studio, the LMS, and Insights. For more information about assigning roles to team members in Studio, see *Add Course Team Members*.

You can also designate teams of people to beta test your course or to moderate and manage its discussions by assigning other roles in the LMS. Beta testers and discussion team members must be enrolled in your course, but they do not need to have the Staff or Admin role. For more information, see *Beta Testing a Course* and *Assign Discussion Administration Roles*.

11.1.1 Administrative Team Roles

To provide access to features on the LMS Instructor Dashboard, you assign the Staff role or the Admin role.

Team members with the **Staff** role can complete these tasks.

- View the course before the Course Start Date.

- Enroll and unenroll students.

- Access student grades.

- Reset student attempts to answer a question correctly.

- See course HTML errors.

- Send email messages to course participants.

Team members with the **Admin** role have access to all of the same options for running the course as team members with the Staff role. They can also complete these tasks.

- Add and remove Staff.

- Add and remove other Admins.

- Add and remove Beta Testers.

- Add and remove Discussion Admins, Discussion Moderators, and Discussion Community TAs.

Note: To moderate course discussions, team members must have one of these discussion roles assigned to them *in addition to* the Staff or Admin role. For more information, see *Assign Discussion Administration Roles*.

11.1.2 Assign Course Team Roles

Before you can assign the Staff or Admin role to a team member, you must meet these prerequisites.

- You must have the Admin role.

- You need the email address or username of each team member you want to add.

- Each of those team members must register a user account for that email address or username, activate the account, and enroll in your course.

To assign a privileged role to a course team member, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select **Staff** or **Admin**.

4. Under the list of users who currently have that role, enter an email address or username, and then select **Add** for the role type.

To remove an assigned role, view the list of users and then select **Revoke access**.

11.2 Enrollment

The course creator, and course team members with the Staff and Admin roles, can enroll learners in a course, see how many people are enrolled, and, when necessary, unenroll learners on the Instructor Dashboard.

Learners can enroll themselves in a course during its defined enrollment period. For a `www.edx.org` course, enrollment is publicly available to anyone who registers an edX account. For other courses, such as those on `edge.edx.org`, enrollment is limited to learners who know the course URL and learners you explicitly enroll.

Section Contents:

- *Registration and Enrollment*
- *Options for Enrolling Learners in a Course*
- *Enroll Learners in a Course*
- *View an Enrollment Count*
- *Report Learners Not Yet Enrolled*
- *Unenroll Learners from a Course*

Data about course enrollment is also available from edX Insights. You access Insights from the Instructor Dashboard for your live course: after you select **Instructor**, follow the link in the banner at the top of each page. For more information, see Using edX Insights.

11.2.1 Registration and Enrollment

Before a learner can enroll in a course, he or she must complete these steps.

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1. Register a user account, which includes supplying a valid email address, on `www.edx.org`, `edge.edx.org`, or your implementation of the edX platform. Each platform requires a separate user account.

2. Activate the registered account by following the emailed instructions.

As long as the course **Enrollment End Date** has not passed, learners who have registered and activated user accounts can enroll themselves in `www.edx.org` courses, or can enroll in other courses if they know the URL.

Course creators, Admins, and Staff, however, can enroll learners in a course either before or after the learners register their user accounts.

Important: To work on a course, every course team member must register and activate a user account and enroll.

11.2.2 Options for Enrolling Learners in a Course

You enroll learners, and other course team members, in your course by supplying their email addresses. After the **Enrollment End Date** for a course learners can no longer enroll themselves; however, you can still explicitly enroll learners.

When you enroll people in a course you have these options:

- **Auto Enroll**. When you choose this option, the people who you enroll do not need to complete an explicit course enrollment step. Of the list of email addresses that you supply, those that correspond to a registered user account are immediately enrolled in the course, and your course displays on the **Current Courses** dashboard for those users on log in. Email addresses on the list that do not match a registered user account are enrolled as soon as that account is registered and activated.

  You can track the enrollment status of the learners who you auto enroll. For more information, see *Report Learners Not Yet Enrolled*.

  If you do not select **Auto Enroll**, the people who you enroll must also actively locate your course and enroll themselves in it. These learners see the course on their dashboards after they have done so.

- **Notify learners by email**. When you choose this option, an email message is automatically sent to each of the email addresses that you supply. The message includes the name of the course and, for learners who are not already enrolled, a reminder to use that same email address to enroll.

  An example of the email message that a learner received when this option was selected during enrollment follows. In this example, the learner already had a registered and activated edx.org account, and both **Auto Enroll** and **Notify students by email** were selected.

You have been enrolled in Introduction to Computer Science and Programming

Inbox x

no-reply@registration.edx.org via amazonses.com   10:36 AM (4 minutes ago)

to me

Dear

You have been enrolled in Introduction to Computer Science and Programming at courses.edx.org by a member of the course staff. The course should now appear on your courses.edx.org dashboard.

To start accessing course materials, please visit https://courses.edx.org/courses/MITx/6.00x/2013_Spring/

This email was automatically sent from courses.edx.org to

11.2.3 Enroll Learners in a Course

To enroll learners or course team members, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Batch Enrollment** section of the page, enter the username or email address of the learner, or enter multiple names or addresses separated by commas or new lines.

   You can copy and paste data from a CSV file of email addresses. However, note that this feature is better suited to courses with smaller enrollments, rather than courses with massive enrollments.

4. To streamline the course enrollment process, leave **Auto Enroll** selected.

5. To send learners an email message, leave **Notify students by email** selected.

6. Select **Enroll**.

Note: If your course has a fee, and an organization wants to purchase enrollment for multiple seats in your course at one time, you can create *enrollment codes* for the organization. The organization then distributes these enrollment codes to its learners to simplify the enrollment process. You can also create coupon codes to give learners a discount when they enroll in your course. For more information, see *Manage Course Fees*.

11.2.4 View an Enrollment Count

After you create a course, you can access the total number of people who are enrolled in it. When you view an enrollment count, note the following

- In addition to learners, the enrollment count includes all course team members, including Admins and Staff. (To work with a course in Studio, the LMS, or Insights, you must be enrolled in that course.)

- Learners can unenroll from courses, and course Admins and Staff can unenroll learners when necessary.

  Note: The enrollment count displays the number of currently enrolled learners and course team members. It is not a historical count of everyone who has ever enrolled in the course.

The total number of current enrollees is shown as the sum of the number of people who selected each of the certification tracks (verified, professional, or honor) that are available for your course.

To view the enrollment count for a course, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Course Info** if necessary.

   The **Enrollment Information** section of the page that opens shows the number of people who are currently enrolled in your course and in each of the certification tracks.

You can also view or download a list of the people who are enrolled in the course. See *Student Data*.

11.2.5 Report Learners Not Yet Enrolled

After you enroll learners in a course using the **Auto Enroll** option, any learner who does not yet have a user account must register and activate an account to complete the enrollment process. In addition, the learner must register the account using the same email address that was used for auto enrollment. You can download a report of auto enrolled email addresses that do not yet correspond to an enrolled learner.

To download this report, follow these steps.

---

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. In the **Reports** section of the page, select **Download a CSV of learners who can enroll**.

   A status message indicates that report generation is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

   To track the progress of the report process, reload the page in your browser and scroll down to the **Pending Tasks** section.

4. To open or save the report, select the `{org}_{course_id}_may_enroll_info_{date}.csv` file name at the bottom of the page.

11.2.6 Unenroll Learners from a Course

You can remove learners from a course by unenrolling them. To prevent learners from re-enrolling, course enrollment must also be closed. You use Studio to set the **Enrollment End Date** for the course to a date in the past. See *Setting Start and End Dates*.

Note: Unenrollment does not delete data for a learner. An unenrolled learner's state remains in the database and is reinstated if the learner does re-enroll.

To unenroll learners, you supply the email addresses of enrolled learners.

1. View the live version of your course.

2. Select **Membership**.

3. In the **Batch Enrollment** section of the page, enter a username or an email address, or multiple names or addresses separated by commas or new lines.

4. To send learners an email message, leave **Notify students by email** selected.

Note: The **Auto Enroll** option has no effect when you select **Unenroll**.

---

5. Select **Unenroll**. The course is no longer listed on the learners' **Current Courses** dashboards, and the learners can no longer contribute to discussions or the wiki or access the courseware.

11.3 Manage Course Fees

If your course has a fee, you can manage the fees for your course in the **E-Commerce** section of the Instructor Dashboard. You can set the price for each seat in the course, create and manage coupon codes and enrollment codes, and download reports about financial transactions.

Before you can manage your course fees, you must configure your Open edX environment to support paid courses.

For more information, see the following sections.

- *Configure the Course*
- *Set the Price of the Course*
- *Create and Manage Coupon Codes*
- *Create and Manage Enrollment Codes*
- *View Enrollment Code and Credit Card Sales Information*

11.3.1 Configure the Course

Configuring your Open edX environment to support paid courses has several steps.

1. *Obtain a merchant account with CyberSource*.

2. *Add configuration code*.

3. *Add a course mode in Django*.

4. *Assign privileged roles to course team members*.

Obtain a Merchant Account with CyberSource

Currently, Open edX only supports payment through CyberSource. To allow users to submit payment for your course, you must obtain a merchant account with CyberSource. For more information, see the CyberSource website.

When you obtain a merchant account with CyberSource, CyberSource provides you with the following information. You will add this information to one of the .json files in your Open edX environment.

- An access key.

- A profile ID.

- A purchase endpoint URL.

- A secret key.

Add Configuration Code

To enable users to pay for your course, you must add the following configuration code in your Open edX environment.

- Add the following code to the lms.env.json file.

```
...
"FEATURES": {
...
"ENABLE_SHOPPING_CART": true,
"ENABLE_PAID_COURSE_REGISTRATION": true,
...
}
....
```

- Add the following code to the lms.auth.json file.

```
...
    "CC_PROCESSOR": {
        "CyberSource2": {
            "ACCESS_KEY": "{access key provided by CyberSource}",
            "PROFILE_ID": "{profile ID provided by CyberSource}",
            "PURCHASE_ENDPOINT": "{purchase endpoint URL provided by CyberSource}",
            "SECRET_KEY": "{secret key provided by CyberSource}"
        }
    },
    "CC_PROCESSOR_NAME": "CyberSource2",
...
```

Add a Course Mode in Django

To manage course fees, you must add a mode for the course in the Django administration website for your Open edX instance.

1. Make sure that you have "superuser" rights on your Open edX production stack. For more information, see Managing the Full Stack.

2. Access the Django administration website for your instance of Open edX. To do this, go to `https://<host name of your Open edX instance>/admin` and sign in. For example, this might be `https://edge.edx.org/admin`.

3. On the **Django Administration** page, select **Course Modes** in the **Site Administration** list.

4. In the upper right corner of the page, select **Add course mode**.

5. On the **Add course mode** page, complete the form.

- **Course id**: Enter the course ID for this course in the `{org}/{course}/{run}` format. This ID must exactly match the course ID that you set in Studio. For example, the course ID may be `edX/DemoX/2015_T2`.

- **Mode slug**: Set this to `honor`.

- **Mode display name**: Enter the mode name that you want learners to see. For example, you could enter "Honor Code".

- **Min price**: Enter the price of a single seat in the course.

- **Currency**: Leave the default value (`usd`) or enter the ISO code for another currency, such as `sar` for Saudi Riyal.

- **Expiration Date and Time**: (optional) The expiration date for the course. EdX recommends that you leave these fields blank.

- **Description**: (optional) A description of the course.

- **SKU**: (optional) A SKU number for the course.

6. At the bottom of the page, select **Save**.

Assign Admin Roles

Two new roles are required for courses that charge fees and that create and manage coupon codes and enrollment codes.

- The *Finance Admin* role creates and manages discounts and enrollment codes. This role also cancels and resubmits invoices.

- The *Sales Admin* role creates and manages coupon codes and enrollment codes, but cannot cancel or resubmit invoices.

To add the Finance Admin or Sales Admin role to a user, follow these steps.

Note: A user can have both the Finance Admin and Sales Admin roles.

1. Access the Django administration website for your instance of Open edX. To do this, go to `https://<host name of your Open edX instance>/admin` and sign in. For example, this might be `https://edge.edx.org/admin`.
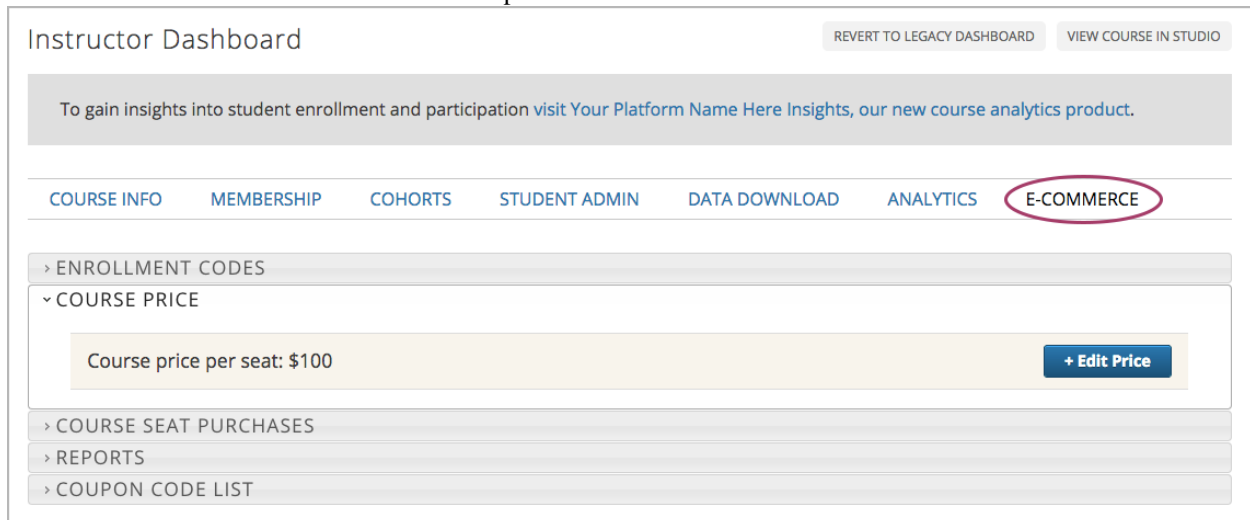
   If you have problems signing in this way, you can also sign in to your edX instance from `https://<host name of your Open edX instance>/`. After you sign in to edX, add `admin` after your Open edX

instance host name in your browser's address bar. Make sure to include a slash (/) between the host name and the word "admin".

2. On the **Django Administration** page, locate **Student** in the **Site Administration** list, and then select **Course access roles**.

3. In the upper right corner of the page, select **Add course access role**.

4. On the **Add course access role** page, complete the form.

   • **User**: The username of the user who needs the Sales Admin or Finance Admin role.

   • **Course id**: Enter the course ID for this course in the `{org}/{course}/{run}` format. This ID must exactly match the course ID that you set in Studio. For example, the course ID may be `edX/DemoX/2015_T2`.

   • **Role**: Select **finance_admin** or **sales_admin**.

To add another role for the user, repeat steps 3-4.

When a user has the Sales Admin or Finance Admin role, that user can see an **E-Commerce** page on the Instructor Dashboard. The **E-Commerce** page includes the following sections. The Finance Admin role can see all sections. The Sales Admin role can see all sections except the **Course Seat Purchases** section.

11.3.2 Set the Price of the Course

You set the price of an individual seat in the course on the **E-Commerce** page on the Instructor Dashboard. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

To set the price for each course seat, follow these steps.

1. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Course Price** section.

2. On the right side of the page, select **Edit Price**.

3. In the **Set Course Price** dialog box, enter the price of each seat in the course. Do not enter a currency symbol.

4. In the **Currency** list, select the currency that you want.

5. Select **Set Price**.

11.3.3 Create and Manage Coupon Codes

You can create coupon codes to give learners a discount on the price of the course. To create and manage coupon codes, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

Learners enter the coupon code when they enroll in and pay for the course. Unlimited learners can use the same coupon code. Optionally, you can set an expiration date for coupon codes.

You can see all the coupon codes for your course in the **Coupon Code List** section of the **E-Commerce** page on the Instructor Dashboard. You can also see information such as the discount amount and the number that have been used.

Coupon Codes					
Coupon Code	**Description**	**Expiration Date**	**Coupon (%)**	**Number Redeemed**	**Actions**
EarlyEnroll	10% discount for learners who enroll before July 1	July 01, 2015	10	81	[x] Edit
COMPANY_ABC	30% discount for employees of Company ABC	None	30	33	[x] Edit
SALE_WEEK	15% discount for learners who enroll between June 8 and 15	June 15, 2015	15	58	[x] Edit
24Hours	20% discount for learners who enroll on June 7	June 08, 2015	20	47	[x] Edit
SRP225		June 30, 2015	25	0	[x] Edit
HOLIDAY_15		June 12, 2015	15	0	[x] Edit

Active coupon codes appear in the order in which they were created. Deleted and expired coupon codes appear at the end of the list.

Create Coupon Codes

You create coupon codes from the **E-Commerce** page on the Instructor Dashboard. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

Your coupon code can be any combination of uppercase and lowercase letters numbers, and special characters. For example, your coupon code could be Holiday_10, MYDISCOUNT, or ZYX321.

Note: The coupon code must have 16 or fewer characters.

To create coupon codes, follow these steps.

1. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Coupon Code List** section.

2. On the right side of the page, select **Add Coupon Code**.

3. In the **Add Coupon Code** dialog box, enter your information in the **Code** and **Discount Percentage** fields.

4. (optional) In the **Description** field, enter a description for your coupon code.

5. (optional) Select **Expiration Date**, and then select a date from the calendar that opens.

6. Select **Add Coupon Code**.

View Coupon Code Information

To see information about a particular coupon code, follow these steps.

1. On the Instructor Dashboard, select the **E-Commerce** page.

2. Select the **Coupon Code List** section.

3. In the **Coupon Codes** list, locate the coupon code that you want to see.

   The **Coupon Codes** list has the following information.

     • **Code**: The name of the code.

     • **Description**: A brief description of the code, if the creator entered one.

     • **Expiration Date**: The date the coupon code expires.

     • **Number Redeemed**: The number of times the coupon code has been used.

     • **Actions**: Actions you can take. You can select [x] to delete the coupon code, or select **Edit** to edit the coupon code.

Edit or Delete Coupon Codes

You edit or delete coupon codes on the **E-Commerce** page on the Instructor Dashboard. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

Note: You can only edit the description of a coupon code. You cannot edit the code, discount percentage, course ID, or expiration date.

---

1. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Coupon Code List** section.

2. In the **Coupon Codes** list, locate the coupon code that you want to edit or delete.

3. To edit the coupon code, select **Edit** in the **Actions** column, edit the description of the coupon code in the **Edit Coupon Code** dialog box, and then select **Update Coupon Code**.

   To delete the coupon code, select the [x] in the **Actions** column. The coupon code moves to the end of the list and appears crossed out with a light red background.

11.3.4 Create and Manage Enrollment Codes

If an organization wants to purchase enrollment for multiple seats in your course at one time, you can create enrollment codes for the organization. The purchasing organization then distributes these codes to its learners. Each enrollment code has an associated URL that learners use to enroll in the course directly. Learners do not have to pay any additional fees.

Unlike coupon codes, which are valid for multiple learners, each enrollment code is valid for only one learner.

Create Enrollment Codes

You create enrollment codes on the **E-Commerce** page on the Instructor Dashboard. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

1. On the Instructor Dashboard, select the **E-Commerce** page.

2. In the **Enrollment Codes** section, select **Create Enrollment Codes**.

---

3. When the **Create Enrollment Codes** form opens, complete the form. The following fields are required.

   - Organization name

   - Organization contact

   - Organization contact email

   - Organization billing address

   - Invoice recipient

   - Number of seats

   - Price per seat

4. At the bottom of the form, select **Create Enrollment Codes**.

When you select **Create Enrollment Codes**, the system automatically creates a comma-separated values (.csv) file and downloads the .csv file to your computer. In addition to information about your course and the transaction, such as the invoice number, the .csv file contains course enrollment codes and URLs. Each enrollment code has a separate URL, and only one student can use each enrollment code.

The system also sends a confirmation email to the purchasing organization. The email instructs the purchasing organization to distribute enrollment codes to students and includes a template that the organization can use. The email has two attachments: an invoice and a .csv file. The .csv file contains only the enrollment codes and their associated URLs. It does not contain additional information about your course or the transaction.

Change the Default Email

When you create enrollment codes, the system automatically sends a confirmation email message to the purchasing organization. You can change the default confirmation message according to your organization.

To change the default email, follow these steps.

1. In your Open edX repository, go to the **edx- platform/lms/templates/emails** folder.

2. In a text editor, open the following three files.

   - **registration_codes_sale_email.txt**: The confirmation email to send to the purchasing organization. This email can include a sample message that the purchasing organization can use to distribute enrollment codes to individual learners.

   - **registration_codes_sale_invoice_attachment.txt**: The invoice for the purchasing organization. The invoice can include payment instructions.

   - **order_confirmation_email.txt**: The confirmation email to send to the purchasing organization.

3. Make any changes that you want to make, and then save your changes.

Manage Enrollment Codes and Invoices

Both sales admins and finance admins can cancel an enrollment code, restore an enrollment code, or mark an enrollment code as unused. In addition, finance admins can cancel and resubmit the invoices that accompany enrollment codes.

Manage Enrollment Codes

You manage individual enrollment codes in the **Enrollment Codes** section of the **E-Commerce** page. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

In the **Enrollment Codes** section, you can perform the following transactions.

- Cancel enrollment codes.

- Restore enrollment codes.

- Mark enrollment codes as unused.

To cancel, restore, or mark an enrollment code as unused, follow these steps.

1. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Enrollment Codes** section.

2. Under **Cancel, restore, or mark an enrollment code as unused**, select **Change Enrollment Code Status**.

3. In the **Enrollment Code Status** dialog box, enter an enrollment code in the **Enrollment Code** field, and then select **Find Enrollment Code**.

4. When the status for the enrollment code appears **Find Enrollment Code**, you can see the possible actions for that enrollment code under **Actions**. Select the action that you want to take.

Note: After you cancel an enrollment code, the learner who used that enrollment code is no longer enrolled in the course and cannot see any course content.

Manage Invoices

You cancel and resubmit invoices for enrollment codes or course seat purchases in the **Course Seat Purchases** section of the **E-Commerce** page. To see the **Course Seat Purchases** section of the **E-Commerce** page, you must have the Finance Admin role. For information, see *Assign Admin Roles*.

To cancel or resubmit an invoice, follow these steps.

1. Locate the number of the invoice that you want to cancel or resubmit. You can download a list of all the invoices for the course by selecting **Download All Invoices**.

2. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Course Seat Purchases** section.

3. Select the action that you want to complete.

   - To cancel an invoice, enter the invoice number in the **Invoice Number** field, and then select **Cancel Invoice**.

   - To resubmit an invoice, enter the invoice number in the **Invoice Number** field, and then select **Resubmit Invoice**. You can find the invoice number in the .csv file that the system creates and downloads to your computer when you create enrollment codes.

Note: After you cancel an invoice, learners who have used any of the enrollment codes on the invoice are no longer enrolled in the course and cannot see any course content.

11.3.5 View Enrollment Code and Credit Card Sales Information

Both sales admins and finance admins can download reports about enrollment codes. In addition, finance admins can see and download information about invoices and credit card sales.

Download Enrollment Code Reports

You download enrollment code reports in the **Enrollment Codes** section of the **E-Commerce** page. To see the **E-Commerce** page, you must have either the Sales Admin or Finance Admin role. For information, see *Assign Admin Roles*.

To help you keep track of the enrollment codes that have been issued for your course, you can download .csv files that contain enrollment code reports. The reports contain data such as the following information.

- A list of the enrollment codes.

- The organization that purchased the enrollment codes.

- The name and e-mail address of the person who purchased the codes.

- The date a specific enrollment code was used.

- The user ID of the learner who used a specific code.

You can download the following reports.

- All enrollment codes that have been purchased for the course.

- The enrollment codes for the course that remain unused.

- The enrollment codes for the course that have been used.

To download an enrollment code report, select the **E-Commerce** page on the Instructor Dashboard, and then select the report that you want in the **Enrollment Codes** section. If you enter an organization name in the **Company Name** field, the report contains the enrollment codes for only that organization.

Download Invoice and Credit Card Sales Information

To see information about financial transactions, including a list of enrollment code invoices and detailed credit card purchase information, you can download .csv files in the **Course Seat Purchases** section of the **E-Commerce** page. To see the **Course Seat Purchases** section of the **E-Commerce** page, you must have the Finance Admin role. For information, see *Assign Admin Roles*.

To see financial transaction information, follow these steps.

1. On the Instructor Dashboard, select the **E-Commerce** page, and then select the **Course Seat Purchases** section.

2. Select the action that you want to complete.

   - View the total dollar amount that the course has received for all credit card transactions.

   - To download a .csv file of all the invoices for enrollment codes, select **Download All Invoices**. This .csv file contains information such as the invoice number, the company that purchased the enrollment codes, the number of enrollment codes purchased, and the number of enrollment codes that have been used.

   - To download a .csv file of all credit card purchases, select **Download Credit Card Purchases**. This .csv file contains information such as the order ID number, the username of the purchaser, the company that the purchaser is affiliated with (if any), and the date and time of the purchase.

11.4 Managing Course Discussions

Discussions, or discussion forums, foster interaction among your students and between students and the course team. You can set up different topics to guide these interactions when you create your course, and then run and moderate discussions throughout the course to encourage participation and develop course community.

Discussions are also excellent sources of feedback and ideas for the future.

For information about running and moderating discussions, see the following sections.

- *Overview*
- *Creating Discussion Topics for Your Course*
- *Assign Discussion Administration Roles*
- *Visibility of Discussion Topics*
- *Run a Discussion*
- *Moderate Discussions*
- *Close Discussions*

For information about how using cohorts in your course affects how your course team might moderate course discussions, see *Managing Discussions in Courses with Learner Cohorts*.

Note: The *Participating in Course Discussions* section describes features that are available to all discussion participants, and might be useful to students who are new to online discussion forums. You can share the section with your students by, for example, adding a "Never Used a Discussion Forum Before?" post that includes the information you think will be most useful to them.

11.4.1 Overview

Students and the course team use course discussions to share ideas, exchange views, consider different viewpoints, and ask questions. In a discussion, there are three hierarchical levels of interaction.

- A *post* is the first level of interaction. A post opens a new subject. Posts can be made as questions, to solicit a concrete answer, or as discussions, to start a conversation. When you add a post, you decide whether to add it as a **Question** or as a **Discussion**.

- A *response* is the second level of interaction. A response is a reply made directly to a post to provide a solution or continue the conversation.

- A *comment* is the third level of interaction. A comment is often a clarification or side note made to a specific response, rather than to the post as a whole.

The dialogue created by a post, its responses, and the comments on those responses is sometimes called a thread. Discussion threads are saved as part of the course history.

All course team members and enrolled students can add posts, responses, and comments, and view all of the posts, responses, and comments made by other course participants.

Members of the course community, students as well as the course team, can be given permission to moderate or administer course discussions through a set of discussion moderation roles.

Note: The course team that you set up in Studio or on the Instructor Dashboard in the LMS are not automatically granted discussion administration roles.

Discussion administration roles must be explicitly granted to members of the course team for them to moderate or administer course discussions. The course author and team members with the Admin role can grant discussion administration roles. For information about assigning discussion privileges, see *Assign Discussion Administration Roles*.

11.4.2 Creating Discussion Topics for Your Course

Discussions in an edX course include both broad topics on course-wide areas of interest such as "Feedback", "Troubleshooting", or "Technical Help", and the content-specific topics that you add to course units as discussion components. You create both types of discussion topics in Studio.

For more information about creating discussion topics, see *Create Course-Wide Discussion Topics* and *Create Content-Specific Discussion Topics*. For information about configuring discussion topics in courses that use cohorts, see *Setting up Discussions in Courses with Cohorts*.

Create Course-Wide Discussion Topics

All courses include a page named **Discussion**. When you create a course, a course-wide discussion topic named "General" is already included by default.

You can add additional course-wide discussion topics to guide how students share and find information during your course. Such course-wide topics might include Introduction and Announcements, Feedback, or Troubleshooting. Discussions in these topics can begin as soon as your course is available.
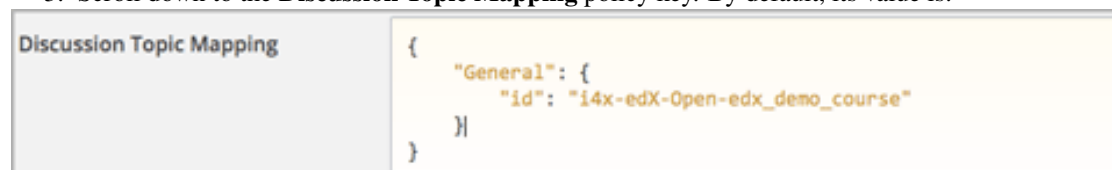
Note: Make sure each discussion topic in your course has a unique name, whether it is a course-wide topic or a content-specific discussion topic that you add as a discussion component. If different discussion topics share the same name, learners might be confused as to which discussion topic they are participating in. For example, do not add a content-specific discussion topic named "General", because a course-wide discussion topic named "General" already exists in every course.

To create a course-wide discussion topic, follow these steps.

1. Open your course in Studio.

2. Select **Settings**, then **Advanced Settings**.

3. Scroll down to the **Discussion Topic Mapping** policy key. By default, its value is:

4. Copy the three lines provided for the General topic and paste them above the closing brace character (`}`):

```
Discussion Topic Mapping    {
                                "General": {
                                    "id": "i4x-edX-Open-edx_demo_course"
                                }
                                "General": {
                                    "id": "i4x-edX-Open-edx_demo_course"
                                }
                            }
```

5. Replace the second "General" with the quoted name of your new topic.

6. Change the value for the second "id" to a unique identifier. For example, append a reference to the name of the topic.

Note: In discussion topic IDs, you can use only alphanumeric characters and these special characters: underscore, hyphen, and period.

7. Add a comma after the first closing brace (`},`).

```
Discussion Topic Mapping    {
                                "General": {
                                    "id": "i4x-edX-Open-edx_demo_course"
                                },
                                "Course Q&A": {
                                    "id": "i4x-edX-Open-edx_demo_course_FAQ"
                                }
                            }
```

8. Click **Save Changes**. Studio resequences and reformats your entry. Scroll back to the **Discussion Topic Mapping** field to verify that your entry was saved as you expect. Entries that do not contain all of the required punctuation characters revert to the previous value when you save, and no warning is presented.

When students click the **Discussion** page for your course, the drop-down Discussion list now includes the topic you added.
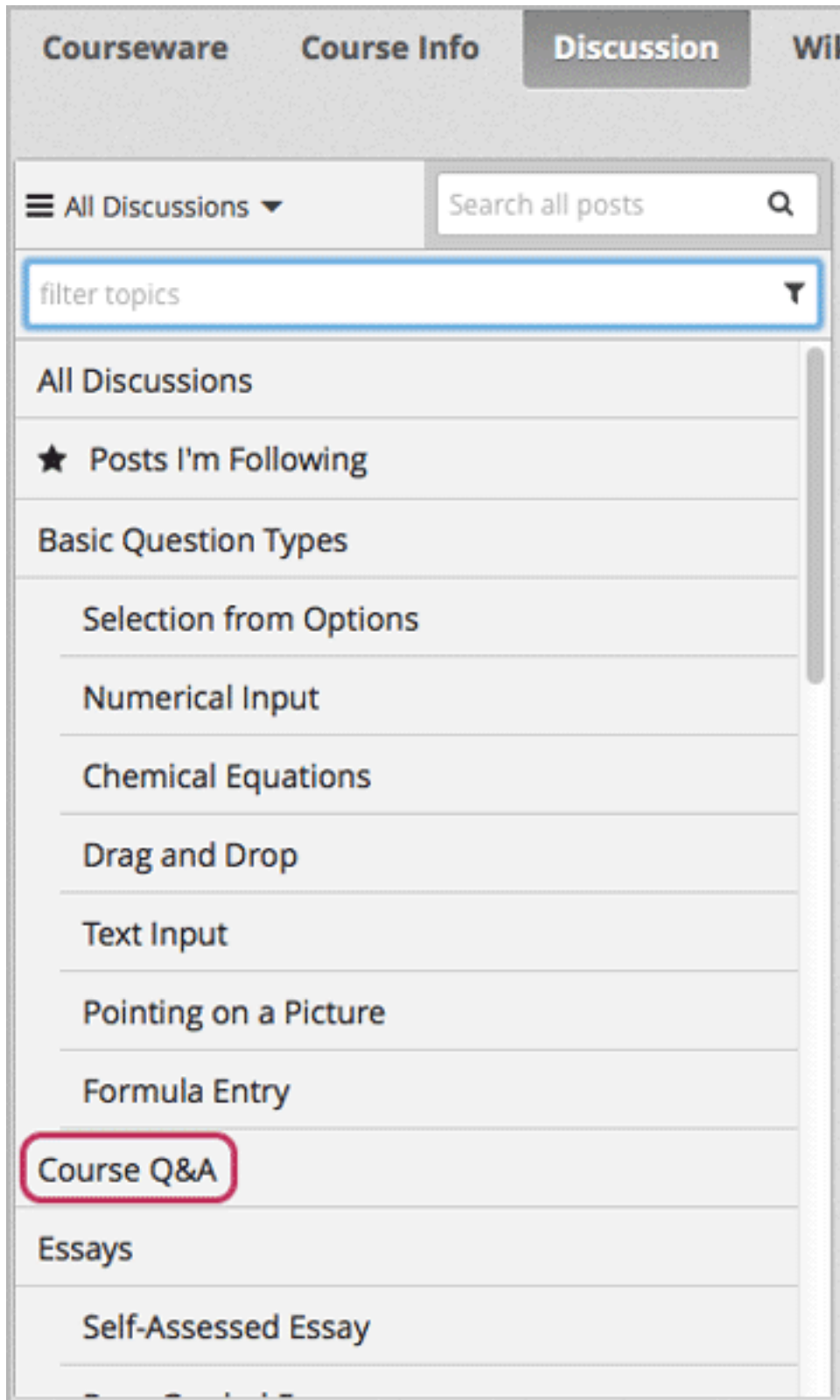
Note: In courses that use cohorts, the course-wide discussion topics that you add are unified. All posts can be read and responded to by every learner, regardless of the cohort that they belong to. You can optionally configure these topics to be divided by cohort. See *Course-Wide Discussion Topics and Cohorts*.

Create Content-Specific Discussion Topics

To create a content-specific discussion topic, you add a discussion component to a unit. Typically, you do this while you are designing and creating your course in Studio. Follow the instructions in *Working with Discussion Components*. The result is a discussion topic associated with a unit and its content.

> **Warning:** Follow the recommended steps to add discussion components. Do not create discussion topics by using the **Duplicate** button in Studio, and do not reference the same discussion ID in more than one place in your course. Duplicated discussion components will result in discussion topics containing the same conversations, even if learners post in different discussion topics.

For more information about the visibility of content-specific discussion topics, see *Visibility of Discussion Topics*.

> **Note:** In courses with cohorts enabled, all content-specific discussion topics are divided by cohort when you first add them. Student posts to divided discussion topics can only be read and responded to by members of the same cohort. You can change the configuration of content-specific discussion topics to make them unified and available to all students in the course. See *Content-Specific Discussion Topics and Cohorts*.

11.4.3 Assign Discussion Administration Roles

You can designate a team of people to help you run course discussions.

> **Note:** The members of the course team that you set up in Studio or on the Instructor Dashboard in the LMS are not automatically granted discussion administration roles.

Discussion administration roles must be explicitly granted to members of the course team for them to moderate or administer course discussions. The course author and team members with the Admin role can grant discussion administration roles. For information about assigning discussion privileges, see *Assign Discussion Administration Roles*.

Different options for working with discussions are available through the following roles.

- *Discussion moderators* can edit and delete messages at any level, review messages flagged for misuse, close and reopen posts, pin posts, and endorse responses. Posts made by moderators are marked as "By: Staff" in the list of posts. Responses and comments made by moderators have a colored "Staff" identifier. This role is often given to course team members who already have the Staff role.

- *Discussion community TAs* have the same options for working with discussions as moderators. Posts made by community TAs are marked as "By: Community TA" in the list of posts on the **Discussion** page. Responses and comments made by community TAs have a colored "Community TA" identifier. This role is often given to students.

- *Discussion admins* have the same options for working with discussions as moderators, and their posts, responses, and comments have the same "Staff" identifiers. This role can be reserved for assignment to course team members who have the Admin role only: the discussion admins can then both moderate discussions and give other users these discussion management roles whenever necessary.

Before you can assign roles to your discussion team, you need their email addresses or usernames.

- To get this information for a course team member, on the Instructor Dashboard select **Membership**, and then select either **Staff** or **Admin**.

- To get this information for an enrolled student, on the Instructor Dashboard select **Data Download**, and then **Download profile information as a CSV**.

Assign Roles

You can assign a course team role to any user who is already enrolled in your course. To assign a discussion administration role, you must be the course author or an Admin.

1. View the live version of the course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select **Discussion Admins**, **Discussion Moderators**, or **Discussion Community TAs**.

4. Under the list of users who currently have that role, enter an email address or username, and then select **Add** for the role type.

Remove Roles

To remove a role from a user, you must be the course author or an Admin.

1. View the live version of the course.

2. Select **Instructor**, and then select **Membership**.

3. In the **Course Team Management** section, select **Discussion Admins**, **Discussion Moderators**, or **Discussion Community TAs**.

4. From the list of users who currently have that role, select the user you want to remove, and then select **Revoke access**.

11.4.4 Visibility of Discussion Topics

The names that you specify as the category and subcategory names for discussion components are not visible on the **Discussion** tab until after the course has started and the unit is released.

However, "seed" posts that you create in content-specific discussion topics before a course starts or before the unit is released are immediately visible on the **Discussion** tab, even though the containing category or subcategory names are not visible. We recommend that you do not create posts in content-specific discussion topics before a unit is released. For more information about release dates and the visibility of components, see *Controlling Content Visibility*.

In contrast, *course-wide discussion topics* that you create on the **Advanced Settings** page in Studio, including the default "General" discussion topic, are immediately visible, regardless of whether the course has started. They are not associated with any particular section or subsection of the courseware, and are not subject to release dates.

11.4.5 Run a Discussion

On an ongoing basis, the members of your discussion team run the course discussion by making contributions, endorsing responses, marking answers as correct, and guiding student messages into pertinent threads. Techniques that you can use throughout your course to make discussions successful follow.

Use Conventions in Discussion Subjects

To identify certain types of messages and make them easier to find, you can define a set of standard tags to include in the subject of a post or in the body of a response or comment. Examples follow.

- Use "[OFFICIAL]" at the start of announcements about changes to the course.

- Provide information about corrected errors with a subject that begins "[CORRECTIONS]" or "[ERRORS]".

- Ask students to use "[STAFF]" in the subject of each post that needs the attention of a course team member.

Both your discussion team and your students can use tags like these to search the discussions more effectively.

When a post is created its type must be selected: either "question" or "discussion". Members of the discussion team should be thoughtful when selecting the type for their posts, and encourage students to do the same. See *Find Questions and Discussions*.

Seed Discussion Topics

To help students learn how to get the most out of course discussions, and find the best discussion topic to use for their questions and conversations, you can seed discussion topics in course-wide discussion topics before the course starts. Some examples follow.

- In the General topic (which is included in every course by default), add an [INTRO] post to initiate a thread for student and course team introductions.

- For each course-wide discussion topic that you create, add an initial post to describe the way you intend that discussion to be used. In addition to providing guidance, these initial messages can act as models for learners to follow when they create their own posts.

We strongly recommend that you do not create seed posts in content-specific discussion topics before the course starts or before the containing unit is released. The category and subcategory names for content-specific discussion topics are subject to the release visibility of their containing unit, and are not visible until the unit is released. For more details, see *Visibility of Discussion Topics*.

Minimize Thread Proliferation

To encourage longer, threaded discussions rather than many similar, separate posts, the discussion team can use these techniques. However, be aware that long threads (with more than 200 responses and comments) can be difficult to read, and can therefore result in an unsatisfactory experience in the discussion.

- Pin a post. Pinning a post makes it appear at the top of the list of posts on the **Discussion** page. As a result, it is more likely that students will see and respond to pinned posts. You can write your own post and then pin it, or pin a post by any author. Select the "More" icon and then **Pin**.
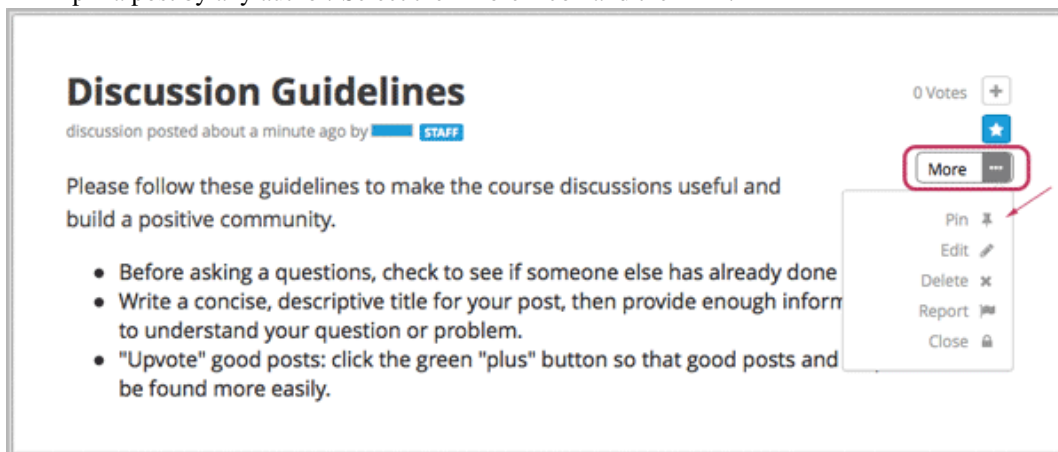
- Endorse a response. Endorsing a response indicates that it provides value to the discussion. Click the "check mark" (or tick mark) icon for the response.
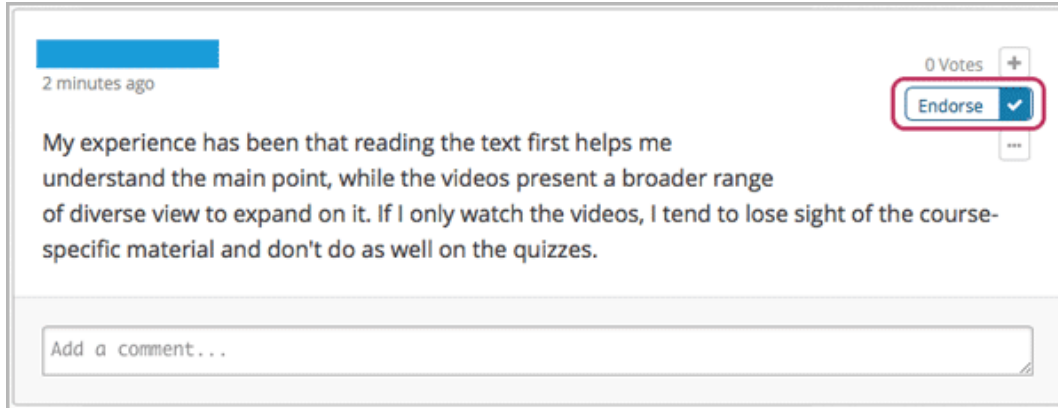
- Mark a question as answered. You use the same procedure to mark a response as the correct answer to a question as you do to endorse contributions to a discussion: click the "check mark" (or tick mark) icon for correct answers.

- Close a post. You can respond to a redundant post by (optionally) pasting in a link to the post that you prefer students to contribute to, and prevent further interaction by closing the post. Select the "More" icon and then **Close** to close it.

- Provide post/response/comment guidelines. You can post information from the *overview* in this chapter, or the *anatomy of edX discussions* in the next chapter, in a course-wide discussion topic (such as General) to provide guidance about when to start a new thread by adding a post, responding to an existing post, or commenting on a response.

11.4.6 Moderate Discussions

The members of a course discussion team monitor discussions and keep them productive. They can also collect information, such as areas of particular confusion or interest, and relay it to the course team.

Developing and sustaining a positive discussion culture requires that sufficient moderator time is dedicated to reviewing and responding to discussions. Keeping up-to-date with a large MOOC forum requires a commitment of 5 or more hours per week, and involves reading threads, replying to and editing posts, and communicating with the rest of the discussion moderation team and other members of the course team.

For information on setting up moderators for your course, see *Assign Discussion Administration Roles*.

View Profile Information for Discussion Participants

If you want to find out more about a specific discussion participant, you can view that learner's edX profile. Learners can have either a limited profile or a full profile.

To view a learner's profile, follow these steps.

1. On the **Discussion** page, select a username in a post, response, or comment.

2. On the **Active Threads** page for that learner, select the learner's username.

The following image shows a learner's username in a post, the learner's username on the **Active Threads** page, and the learner's profile page.

For more information, or to create your own profile, see View, Create, or Edit an edX Profile.

Provide Guidelines for Students

You can develop a set of best practices for discussion participation and make them available to students as a course handout file or on a defined page in your course. These guidelines can define your expectations and optionally introduce features of edX discussions.

You can also share the *Participating in Course Discussions* chapter with your students. It describes features that are available to all discussion participants, and may be useful to students who are new to online discussion forums.

Develop a Positive Discussion Culture

Discussion monitors can cultivate qualities in their own discussion interactions to make their influence positive and their time productive.

- Encourage quality contributions: thank students whose posts have a positive impact and who answer questions.

- Check links, images, and videos in addition to the text of each message. Edit offensive or inappropriate posts quickly, and explain why.

- Review posts with a large number of votes and recognize "star posters" publicly and regularly.

- Stay on topic yourself: before responding to a post, be sure to read it completely.

- Maintain a positive attitude. Acknowledge problems and errors without assigning blame.

- Provide timely responses. More time needs to be scheduled for answering discussion questions when deadlines for homework, quizzes, and other milestones approach.

- Discourage redundancy: before responding to a post, search for similar posts. Make your response to the most pertinent or active post and then copy its URL and use it to respond to the redundant threads.

- Publicize issues raised in the discussions: add questions and their answers to an FAQ topic, or announce them on the Course Info page.

For a template that you can use to develop guidelines for your course moderators, see *Guidance for Discussion Moderators*.

Find Questions and Discussions

When students create posts, they specify the type of post to indicate whether they are asking for concrete information (a question) or starting an open-ended conversation (a discussion).

On the **Discussion** page, a question mark image identifies posts that ask questions, and a conversation bubble image identifies posts that start discussions. When an answer is provided and marked as correct for a question, a check or tick mark image replaces the question mark image. See *Answer Questions and Mark Questions as Answered*.

In addition to these visual cues, filters can help you find questions and discussions that need review. Above the list of posts on the **Discussion** page, the **Show all** filter is selected by default. You can also select:

- **Unread**, to list only the discussions and questions that you have not yet viewed.

- **Unanswered**, to list only questions that do not yet have any responses marked as answers.

Edit Messages

Discussion moderators, community TAs, and admins can edit the content of posts, responses, and comments. Messages that include spoilers or solutions, or that contain inappropriate or off-topic material, should be edited quickly to remove text, images, or links.

1. Log in to the site and then select the course on your **Current Courses** dashboard.

2. Open the **Discussion** page and then open the post with the content that requires editing. You can select a single topic from the drop-down list of discussion topics, apply a filter, or search to locate the post.

3. For the post or for the response or comment that you want to edit, click the "More" icon and then **Edit**.

4. Remove the problematic portion of the message, or replace it with standard text such as "[REMOVED BY MODERATOR]".

5. Communicate the reason for your change. For example, "Posting a solution violates the honor code."

Delete Messages

Discussion moderators, community TAs, and discussion admins can delete the content of posts, responses, and comments. Posts that include spam or abusive language may need to be deleted, rather than edited.

1. Log in to the site and then select the course on your **Current Courses** dashboard.

2. Open the **Discussion** page and then open the post with the content that requires deletion. You can select a single topic from the drop-down list of discussion topics, apply a filter, or search to locate the post.

---

3. For the post or for the response or comment that you want to delete, click the "More" icon and then **Delete**.

4. Click **OK** to confirm the deletion.

Important: If a message is threatening or indicates serious harmful intent, contact campus security at your institution. Report the incident before taking any other action.

Respond to Reports of Misuse

Students have the option to report contributions that they find inappropriate. Moderators, community TAs, and admins can check for messages that have been flagged in this way and edit or delete them as needed.

1. View the live version of your course and click **Discussion** at the top of the page.

2. In the list of posts on the left side of the page, use the filter drop-down list (set to **Show all** by default) to select **Flagged**.

3. Review listed posts. A post is listed if it or any of its responses or comments has been reported. The reported contribution includes a **Reported** identifier.

4. Edit or delete the post, response, or comment. Alternatively, remove the flag: click the "More" icon and then **Unreport**.

Block Users

For a student who continues to misuse the course discussions, you can unenroll the student from the course. See *Unenroll Learners from a Course*. If the enrollment period for the course is over, the student cannot re-enroll.

11.4.7 Close Discussions

You can close the discussions for your course so that students cannot add messages. Course discussions can be closed temporarily, such as during an exam period, or permanently, such as when a course ends.

When you close the discussions for a course, all of the discussion topics in course units and all of the course-wide topics are affected.

- Existing discussion contributions remain available for review.

- Students cannot add posts, respond to posts, or comment on responses. However, students can continue to vote on existing threads, follow threads, or report messages for misuse.

- Course team members with the Staff, Admin, Discussion Admins, Discussion Moderators, and Discussion Community TAs roles are not affected when you close the discussions for a course. Users with these roles can continue to add to discussions.

Note: To make sure your students understand why they cannot add to discussions, you can add the dates that discussions are closed to the **Course Info** page and post them to a General discussion.

Start-End Date Format Specification

To close course discussions, you supply a start date and time and an end date and time in Studio. You enter the values in this format:

```
["YYYY-MM-DDTHH:MM", "YYYY-MM-DDTHH:MM"]
```

---

where:

- The dates and times that you enter are in the Universal Coordinated (UTC) time zone, not in your local time zone.

- You enter an actual letter **T** between the numeric date and time values.

- The first date and time indicate when you want course discussions to close.

- The second date and time indicate when you want course discussions to reopen.

- If you do not want the discussions to reopen, enter a date that is far in the future.

- Quotation marks enclose each date-time value.

- A comma and a space separate the start date-time from the end date-time.

- Square brackets enclose the start-end value pair.

- You can supply more than one complete start and end value pair. A comma and a space separate each pair.

For example, to close course discussions temporarily for a final exam period in July, and then permanently on 9 August 2014, you enter:

```
["2014-07-22T08:00", "2014-07-25T18:00"], ["2014-08-09T00:00",
"2099-08-09T00:00"]
```

You enter these values between an additional pair of square brackets which are supplied for you in Studio.

Define When Discussions Are Closed

To define when discussions are closed to new contributions and when they reopen:

1. Open your course in Studio.

2. Select **Settings**, then **Advanced Settings**.

3. Scroll down to the **Discussion Blackout Dates** policy key.

4. In the field for the value, place your cursor between the supplied square brackets. Use the required date format specification to enter the start and end dates for each time period during which you want discussions to be closed.

   When you enter the dates and times from the example above, the value field looks like this:

5. Click **Save Changes**.

   Studio reformats your entry to add line feeds and indentation, like this:

For examples of email messages that you can send to let students know when the course discussions are closed (or open), see *Example Messages to Students*.

11.5 Participating in Course Discussions

Course discussions give you the opportunity to start conversations with other students, ask questions of the course team, and participate in the course community. If you have not previously participated in an online discussion forum, see the introductory *"anatomy"* section.

This chapter also describes features of edX discussions that can make your participation more effective. These include ways to:

- *Find Posts*
- *Add a Post, Response, or Comment*
- *Keep Up with New Activity*
- *Provide Feedback on Contributions*

11.5.1 Anatomy of edX Course Discussions

Posts, Responses, and Comments

```
Post: "Please introduce yourself."
 - Reponse: "My name is Lee and I teach secondary school maths in Canberra,
   Australia."
 - Reponse: "Hello everyone, I am Sumei from Hong Kong, China."
   - Comment: "Hi Sumei, I am taking this course in Hong Kong too. Maybe we
     should make a study group!"
   - Comment: "I'd like to join the Hong Kong study group too, I think it
     will help me keep up with the homework."
 - Response: "Hi from Johannesburg! I am taking the course to prepare for my
   matric exams."
```

This example shows the different ways that you can contribute to a discussion. The *post* initiates the conversation, *responses* are replies to the post, and *comments* expand on specific responses. Before you add a post, response, or comment, take a moment to consider which of these options best suits the contribution that you want to make. This helps keep course discussions organized and easy to follow.

Discussion Topics

Most edX courses include opportunities to discuss specific video lectures, reading assignments, homework problems, or other course content. Each of these content-specific discussion opportunities is called a *topic*. When these discussion topics are included in a course, they typically appear below the content they apply to.
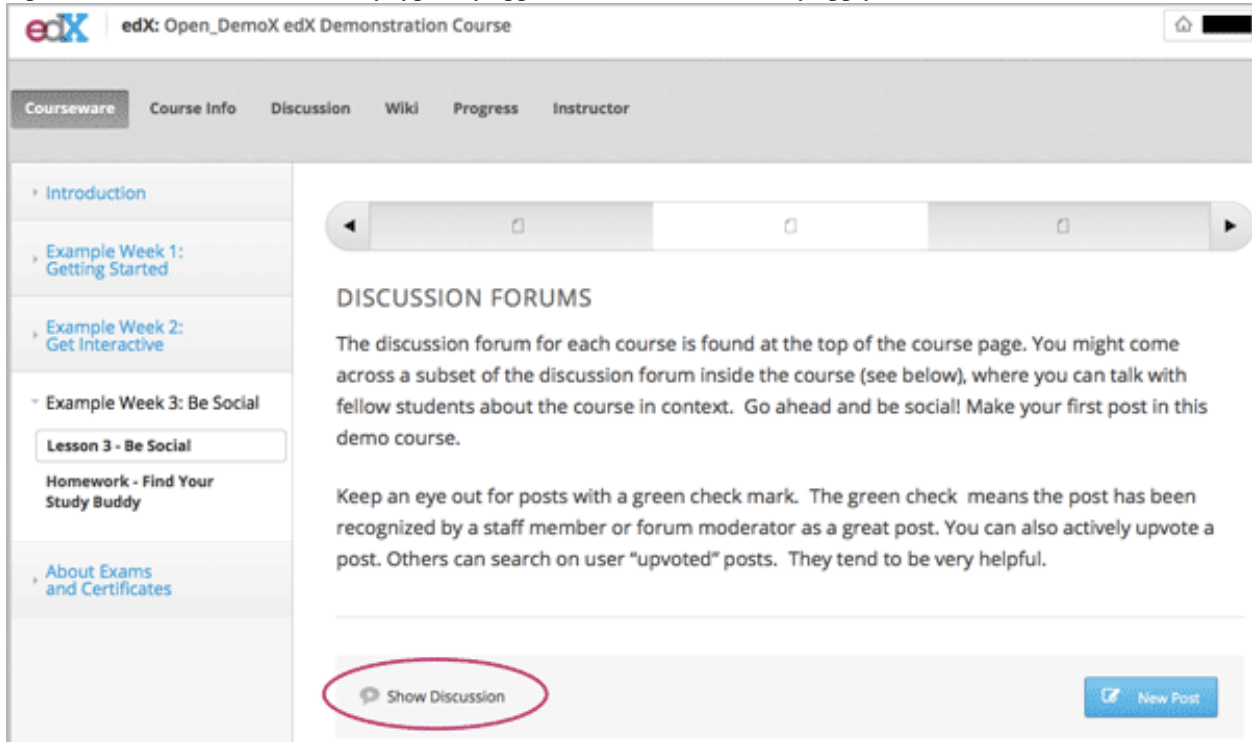
Most courses also include one or more topics for course-wide discussions, such as "Frequently Asked Questions" and "Troubleshooting". You access these topics on the **Discussion** page of the course: click the **All Discussions** drop-down.
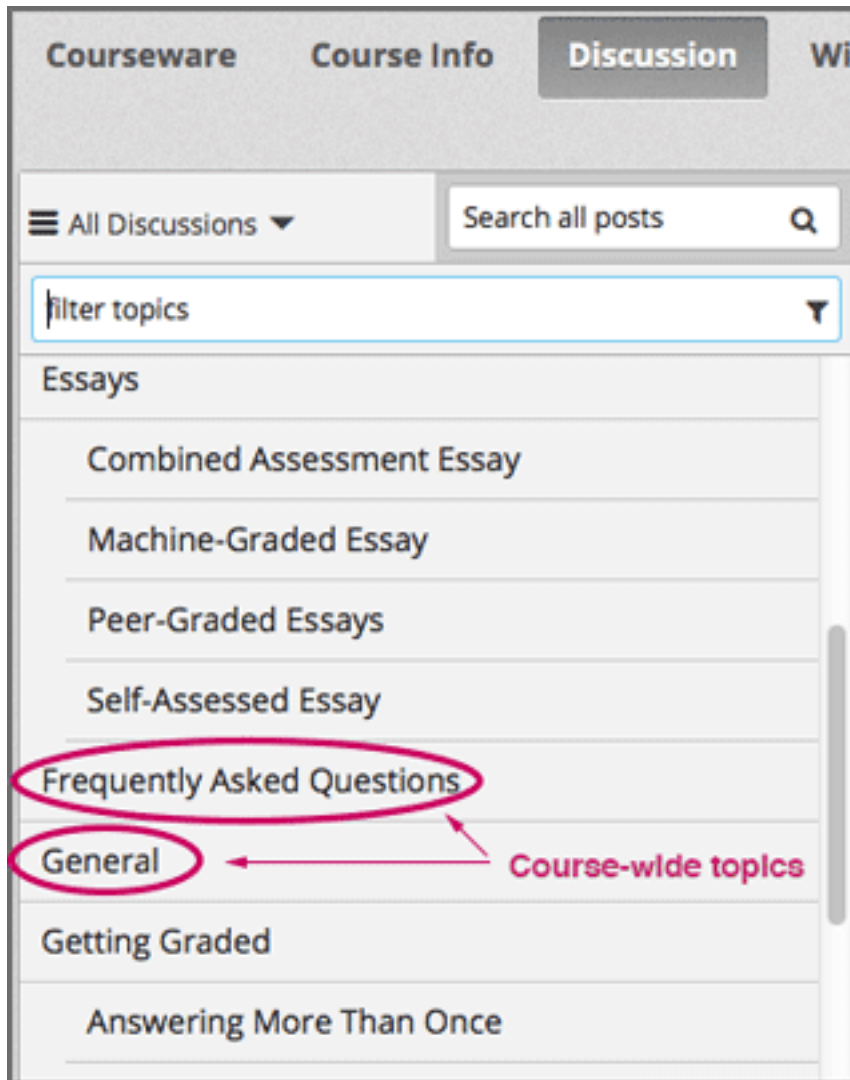
When you visit the **Discussion** page, you can read and add to any of the discussion topics.

- Course-wide topics do not have other topics indented below them.

- Content-specific topics are indented under an identifying category name.

Notice that you can access content-specific topics both on the **Discussion** page and also while you are navigating through course content on the **Courseware** page. However, you can only access the course-wide topics on the **Discussion** page.

Before you add a post, look through the topics. When you add your post to the most appropriate topic, others with the same interest can find, read, and respond to it more easily.

Types of Discussion Posts

When you make a contribution in a course discussion topic, you add your post as either a question or a discussion.

- A *question* post raises an issue so that members of the discussion moderation team and the course community can provide answers.

- A *discussion* post starts a conversation by sharing thoughts and reflections, and inviting community participation.

When you add a post to a discussion topic, you must specify whether it is a question or a discussion.

After you make your post, on the **Discussion** page for your course, a question mark image identifies posts that ask questions and a conversation bubble image identifies posts that start discussions.
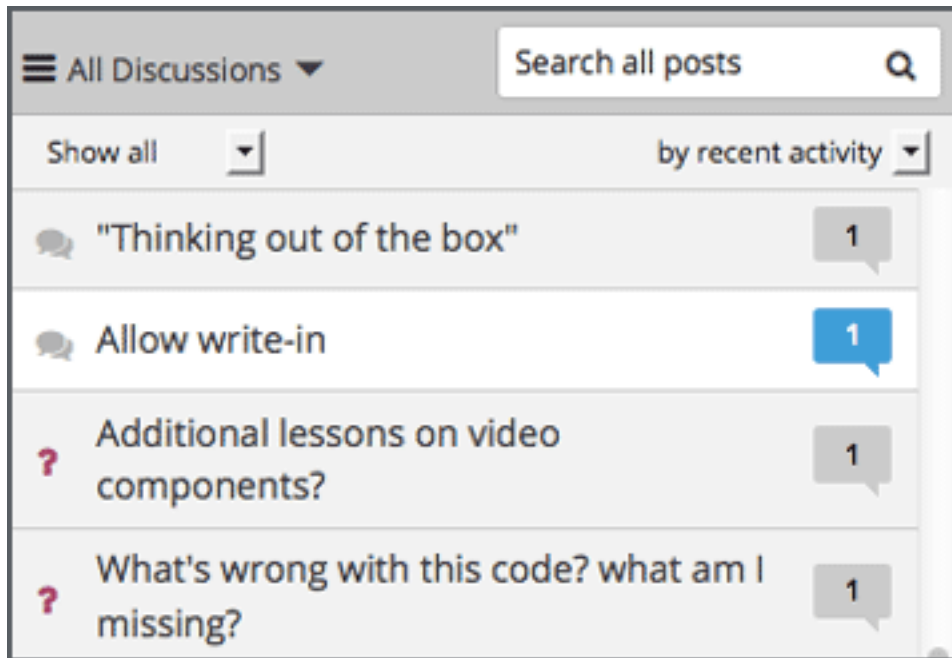
If you have any difficulty deciding which type of post you want to add, think about whether you want to get concrete information (a question) or start an open-ended conversation (a discussion). If you require an answer from the course team, be sure to create your post as a question, so that the course team sees that a response is required and responds appropriately.

11.5.2 Find Posts

Finding out whether someone else has already asked the same question or initiated a conversation about the same subject that interests you, and then reading and contributing to that exchange instead of starting a new one, helps make the time that everyone spends with the course discussion more productive. You can search for something specific, or you can browse through the posts in a single discussion topic.

Search the Discussions

To search for text, click **Discussion** and enter a phrase, a word, or part of a word in the **Search all posts** field above the list of posts. When you press Enter, the search tries to find:

- A match or close match to your text in any post, response, or comment. The display updates to show a list of the posts that have a match at any level of interaction.

- A similar value in any post, response, or comment (if no exact matches are found). A "No results found for {text}. Showing results for {similar}" message displays above the posts that have similar text at any interaction level.

- Any usernames that are an exact match to your text. A "Show posts by {username}" option displays above any posts that have an exact text match at any interaction level. Click the username in the message to read that user's posts, responses, and comments.

Review Posts About a Single Topic

To review posts about a particular part of the course or type of issue, click **Discussion** at the top of the page and then select a topic from the drop- down list. (**All Discussions** is selected by default.) Only posts about the topic you select appear in the list of posts.
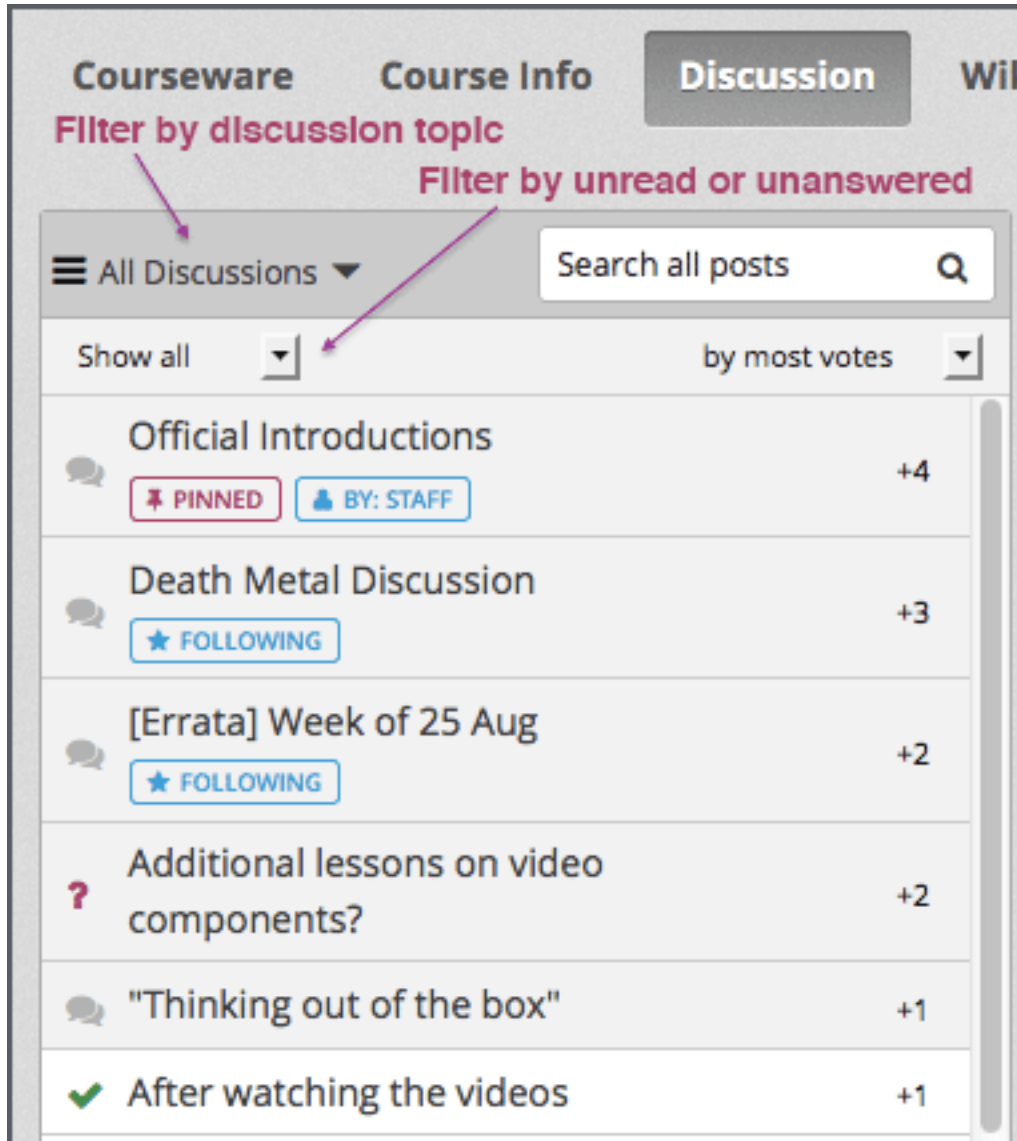
Review Only Unread or Unanswered Posts

To limit the posts shown on the **Discussion** page, you can select one of the filter options. Above the list of posts, the **Show all** filter is selected by default.

- To list only the discussions and questions that you have not yet viewed, select **Unread**.

- To list only question posts that do not yet have any responses marked as answers, select **Unanswered**.

11.5.3 Add a Post, Response, or Comment

Add a Post

To make sure that other students and the course team can find and respond to your post, determine the type for your post: either question or discussion.

Add a Post to a Content-Specific Discussion Topic

1. Click **Courseware**.

2. Open the part of the course that includes the discussion topic that you want to add to.

3. To read what others have already contributed to the conversation, click **Show Discussion**.

   You can scroll through the posts that have already been added: the title and the first sentence or two of each post appear. To read an entire post, view the responses to it, and see any comments, click **Expand discussion**.

4. To add a post, click **New Post**.

5. Select the type of post: click **Question** or **Discussion**.

6. Enter a short, descriptive identifier for your post in the **Title** field. The title is the part of your post that others see when they are browsing on the **Discussion** page or scrolling through one of the content-specific topics.

7. Enter the complete text. Options for formatting the text and for adding links or images are available: click the buttons above the text field.

Add a Post to a Course-Wide Discussion Topic

You can also use this procedure to add a post to any of the content-specific discussion topics.

1. Click the **Discussion** page.

2. Click **New Post**.

3. Select the type of post: click **Question** or **Discussion**.

4. Select the most appropriate discussion topic for your post.
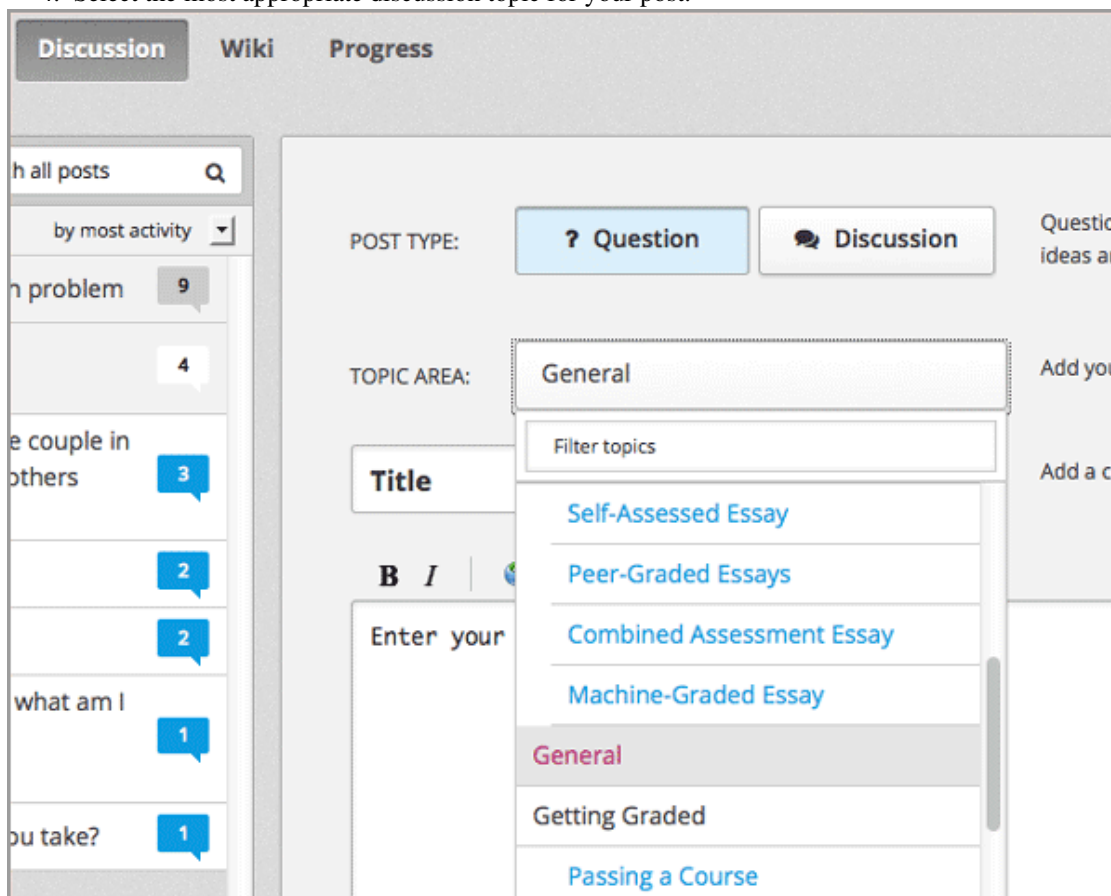
5. Supply a short, descriptive **Title**. The title is the part of your post that others see when they are browsing on the **Discussion** page or scrolling through one of the content-specific topics.

6. Enter the complete text. Options for formatting the text and for adding links or images are available: click the buttons above the text field.

Add a Response or Comment

To participate in an ongoing discussion, you reply to the initial post by adding a response, or expand on a particular response by adding a comment.

The same options for formatting the text and for adding links or images are available for responses and comments as for posts.

Add a Response or Comment to a Content-Specific Discussion Topic

1. Click **Courseware**.

2. Open the part of the course with the discussion topic where you want to make your contribution.

3. Click **Show Discussion**.

4. Scroll to the post where you want to add your thoughts.

5. Click **Expand discussion**.
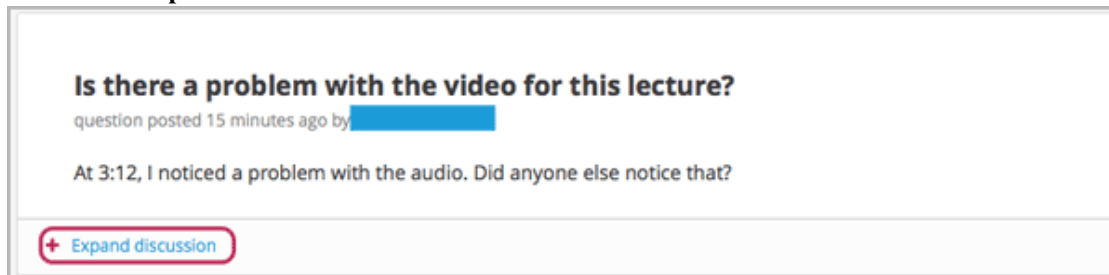
6. Add a response or comment.

- To add a response to the post, click **Add A Response**. When your response is complete, click **Submit**.

- To add a comment to a response, click in the **Add a comment** field below the response. When your comment is complete, click **Submit**.

Add a Response or Comment to a Course-Wide Discussion Topic

You can also use this procedure to add a response or comment to any of the content-specific discussion topics.

1. Click the **Discussion** page.

2. Find the post that you want to contribute to. To help you decide where to add your thoughts, review the current responses and their comments.

3. Add a response or comment.

- To add a response to the post, click **Add A Response**. When your response is complete, click **Submit**.
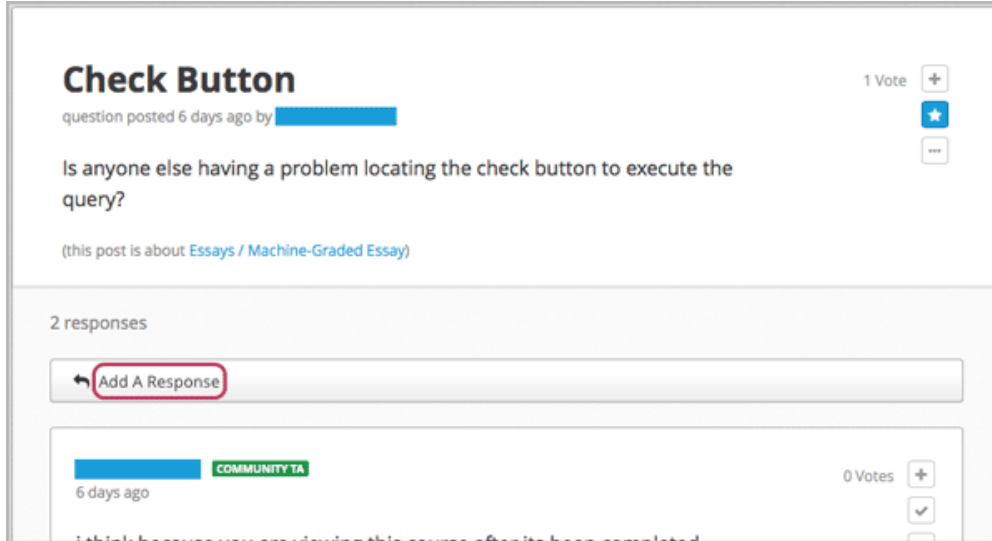
- To add a comment to a response, click in the **Add a comment** field below the response. When your comment is complete, click **Submit**.

11.5.4 Keep Up with New Activity

Read New or Updated Posts

The list of posts on the **Discussion** page provides visual cues to help you identify posts that are new, or that have responses or comments that you have not read yet, and to distinguish them from exchanges that you have already read completely.

- Posts that you have not read yet have a blue callout image.
- Posts that you have read, but with responses or comments that you have not read yet, have a white callout image.
- Exchanges that you have read completely have a gray callout image and background.
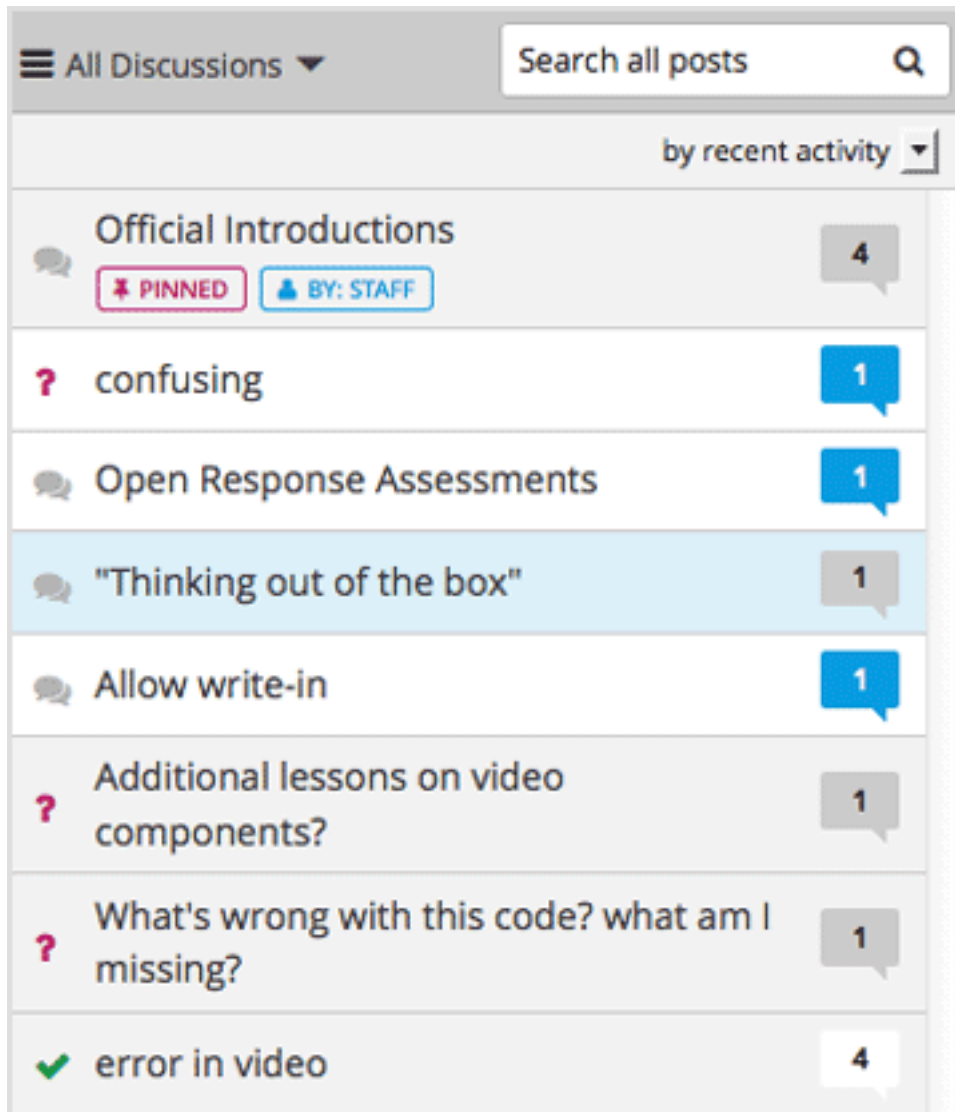
The total number of contributions in the exchange (the post and its responses and comments) appears in each callout image. To see the number of contributions that you haven't read yet, move your cursor over the callout image.
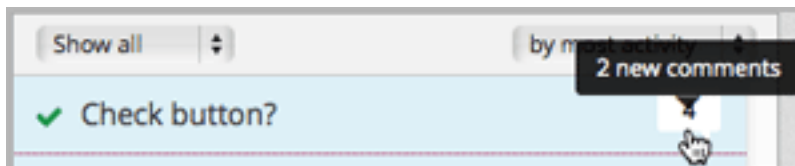
The color-coded callout images appear when you sort the list of posts **by recent activity** or **by most activity**. If you sort the list of posts by most votes instead, the number of votes that the post has received appears in place of the callouts. See *Vote for Posts or Responses*.

Receive Daily Digests

You have the option to receive an email message each day that summarizes discussion activity for the posts you are following. To receive this daily digest, click **Discussion** and then select the **Receive updates** checkbox.

11.5.5 Provide Feedback on Contributions

As you read the contributions that other students and team members make to discussion topics, you can provide feedback without writing a complete response or comment. You can provide feedback in these ways.

- *Vote for posts and responses* to provide positive feedback.

- *Follow posts* so that you can check back in on interesting conversations and questions easily.

- *Answer questions, and mark your questions as answered*.

- *Report a contribution* that is inappropriate to the discussion moderation team.

To select a feedback option, you use the icons at the top right of each post, response, or comment. When you move your cursor over these icons a label appears.
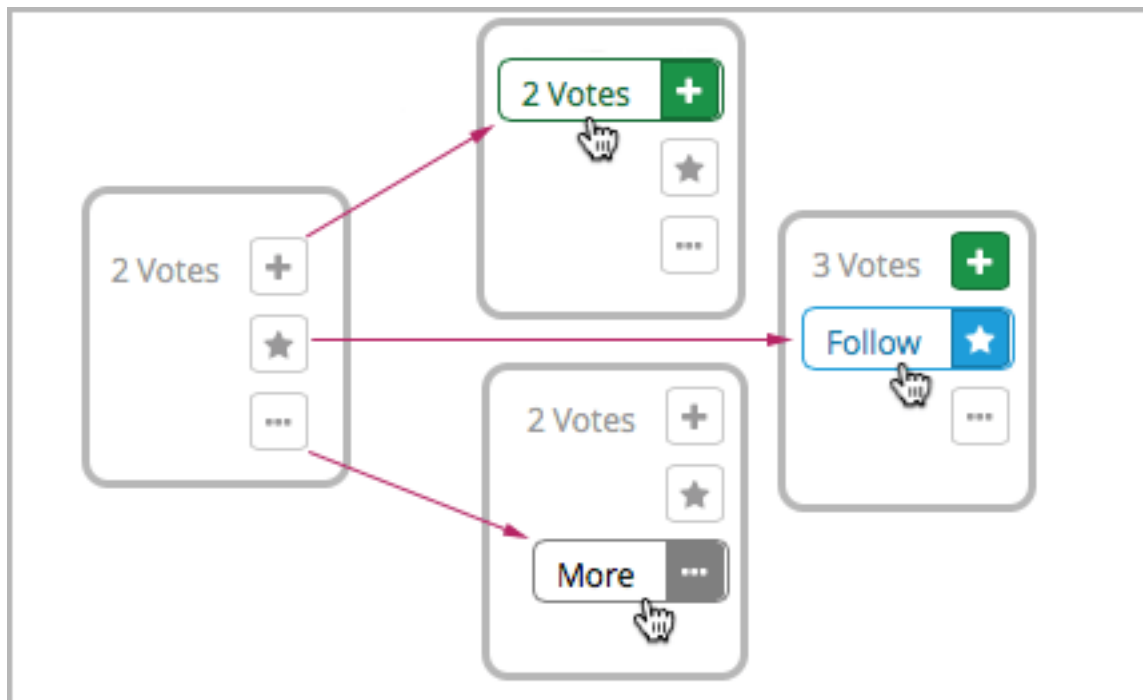
When you click the "More" icon, a menu of the options that currently apply appears.
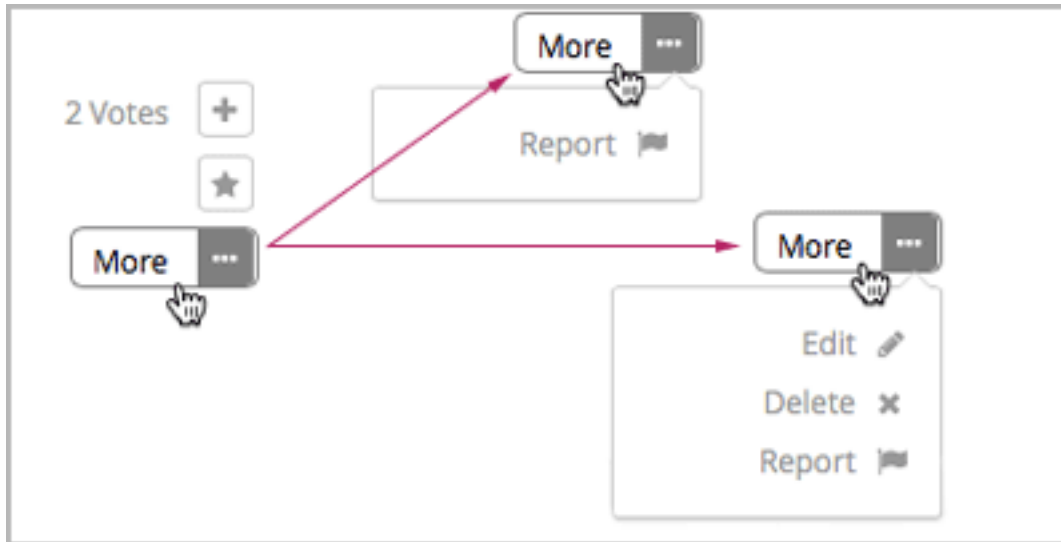
Vote for Posts or Responses

If you like a post or one of its responses, you can vote for it: view the post or response and click the "Vote" icon at top right.
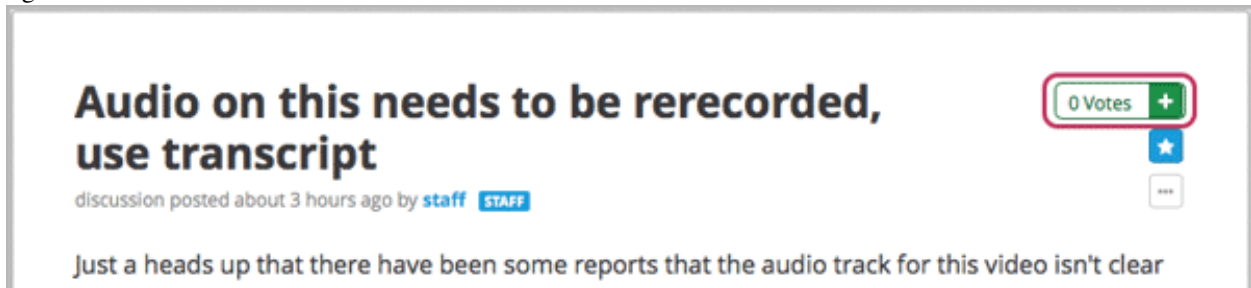
You can sort the list of posts so that the posts with the most votes appear at the top: click the drop-down list of sorting options and select **by most votes**.
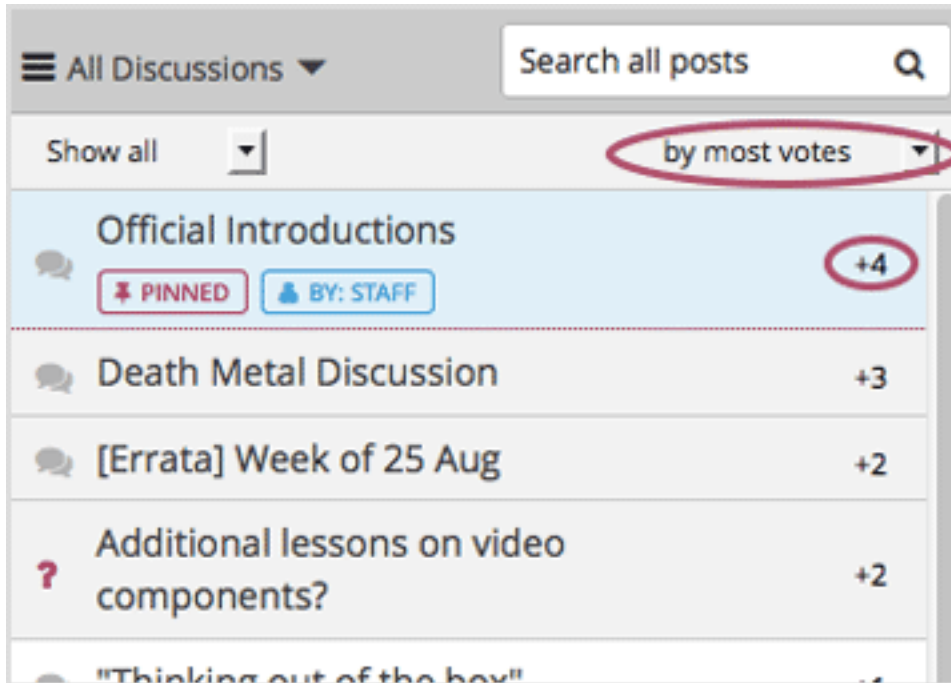
The number of votes that each post has received displays in the list of posts. (Votes for responses are not included in the number.)

Follow Posts

If you find a post particularly interesting and want to return to it in the future, you can follow it: view that post and click the "Follow" icon.
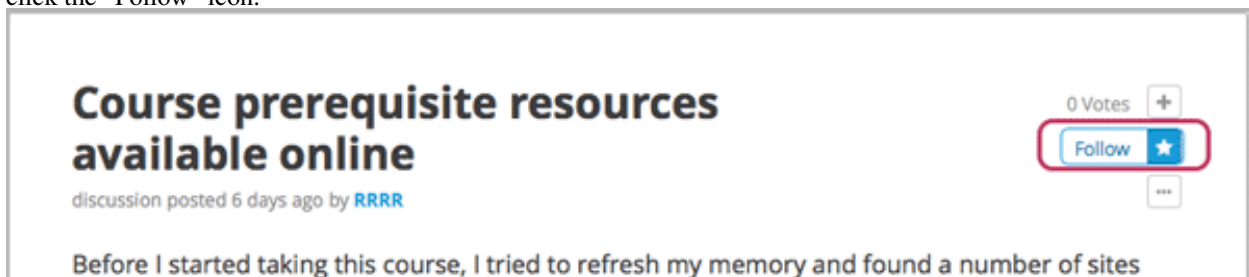
Each post that you follow appears with a "Following" indicator in the list of posts.

To list only the posts that you are following, regardless of the discussion topic they apply to, click the drop-down Discussion list and select **Posts I'm Following**.
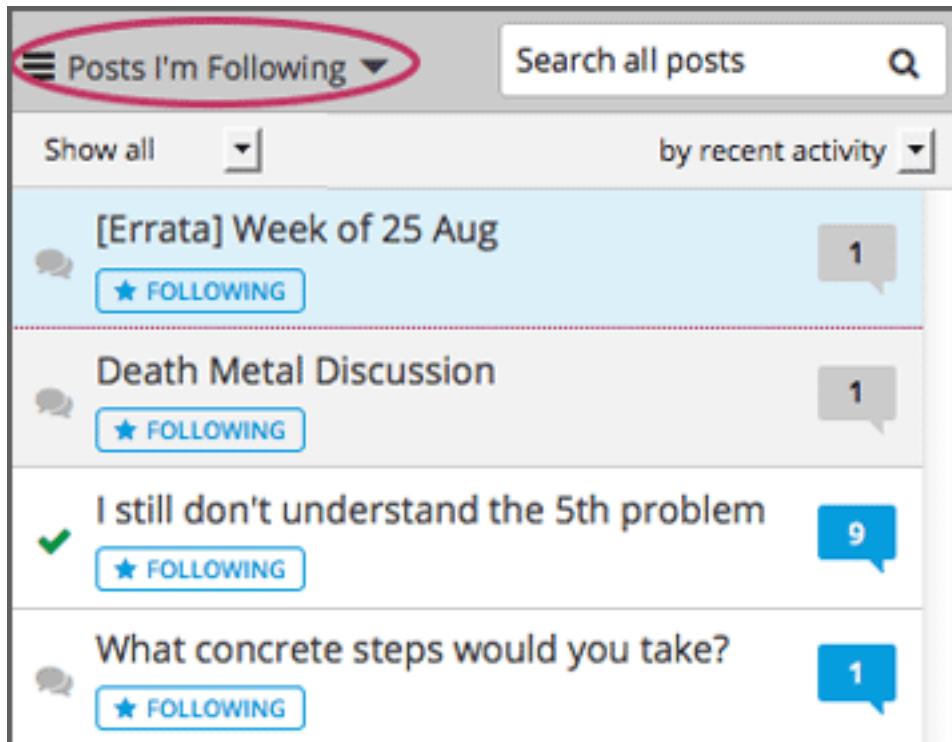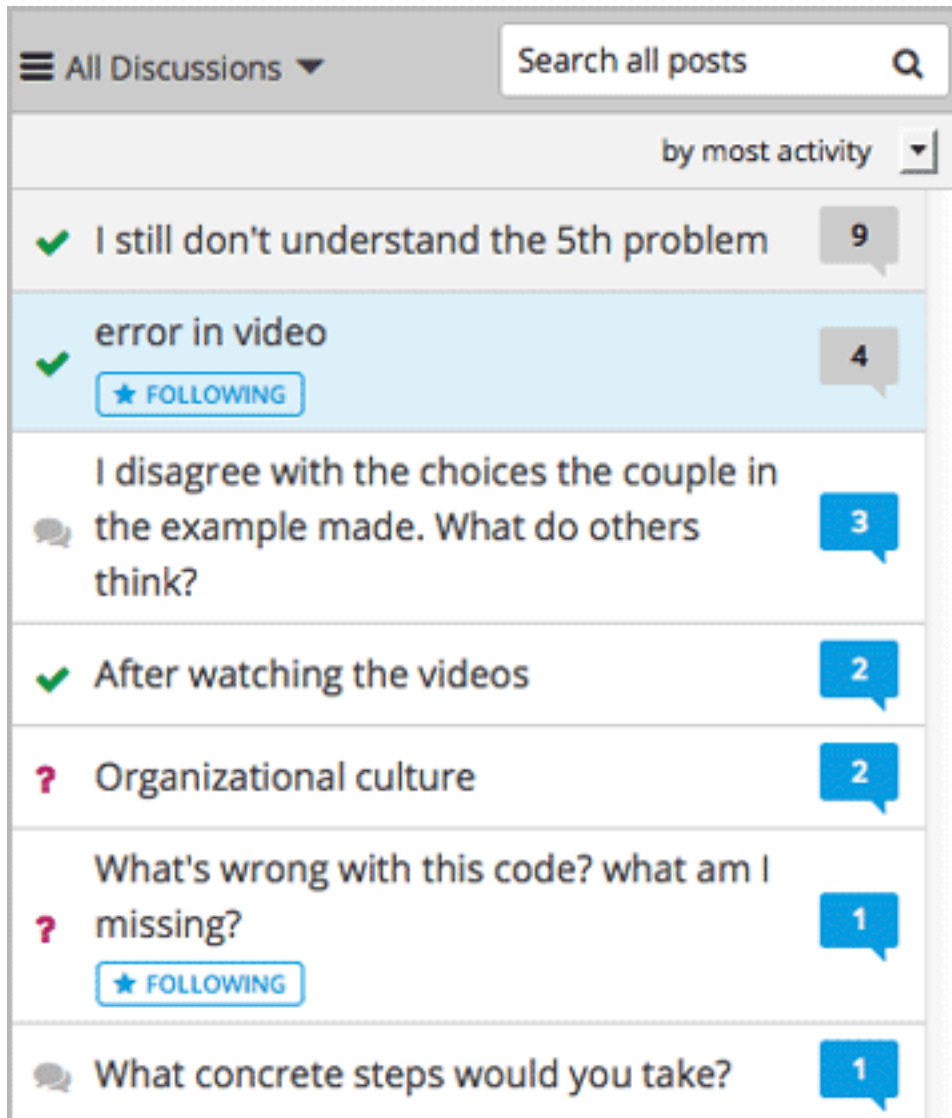
Answer Questions and Mark Questions as Answered

Anyone in a course can answer questions. Just add a response to the question post with your answer.

The person who posted the question (and members of the discussion moderation team) can mark responses as correct: click the "Mark as Answer" icon that appears at upper right of the response.

After at least one response is marked as the answer, a check or tick mark image replaces the question mark image for the post in the list on the **Discussion** page.

Report Discussion Misuse

You can flag any post, response, or comment for a discussion moderator to review: view the contribution, click the "More" icon, and then click **Report**.

11.6 Guidance for Discussion Moderators

Discussion forums are hugely important tools in running a successful MOOC; they allow for substantive community development, in addition to being excellent sources of feedback and ideas for future iterations of the course.

Moderators are the key to effectively managing these online communities. Moderators keep the discussions productive and relay important information (errors, student confusion with or interest in particular topics, and so on) to the rest of the course team. Discussions can be moderated by any of a number of members of the course team, but dedicating enough time to moderation is the best way to cultivate a successful discussion culture.

Feel free to use some or all of the information in this chapter to guide the contributions of your discussion moderators.

11.6.1 Responsibilities

- Answer basic questions posed by students, and direct students with questions to the right resources: syllabi, course documents, course updates, useful lecture segments, example problems, etc.

- Relay reports of errata, common misconceptions and questions, highly disruptive participants, bugs, and amusing or interesting posts to the most appropriate course team members.

- Enforce the Honor Code by editing or deleting problem answers, or requests for answers, promptly.

- Edit out offensive content from the discussion, and remind the originators of discussion etiquette and expectations.

- Communicate problems and successes to your fellow moderators.

- Identify students whose presence in the discussions has a strongly positive impact. These students can be promoted to community TA role and publicly acknowledged.

- Add helpful items to the FAQ or Course Info page.

11.6.2 Qualities of good discussion moderators

- Good or great content knowledge: stellar students from previous years often make good moderators.

- Solid communication skills: the ability to organize positive, consistent, and effective communication with students, other moderators, and members of the course team.

- Time: keeping up-to-date with the discussions for a large MOOC requires at least 5 hours per week for reading posts, replying to or editing posts, and communicating with the other moderators and the course team.

- Enthusiasm: this is the best predictor of moderator excellence!

11.6.3 Best practices for discussion moderation

- Always maintain a positive attitude. Keeping a positive attitude is crucial to encouraging participation in the discussion community.

- Encourage discussion between students. Actively thank students who answer the questions of others.

- Use the course's FAQ and Course Info pages as resources. Provide links to these pages in your responses when appropriate. Suggest that information be added to these resources when necessary to respond to a common question or fix confusion.

- Always make it obvious that you have read the student's question. When you post a response, make sure that you are on topic. Respond in the context of the thread.

- Develop a discussion persona. Try to answer your questions in your own slightly unique way.

11.6.4 Guidelines for specific types of posts

Certain types of posts require more attention from the moderators than others, or might need to be handled in a particular way.

Time sensitive problems

- Try to be present on discussion threads when assignment due dates are approaching or new content is being released. The discussions tend to be extra busy at these times.

- Alert the course team about problems that need to be dealt with quickly, such as problems with graded assignments. Setting up a course email address that is checked frequently is a good way to manage such alerts.

Content Questions

- Assist with content questions sensitively, but be careful not to post spoilers. Do not ask students to post their solutions!

- A good guiding question can be better than an answer.

Redundant posts

- When possible, help discourage redundancy by responding to such posts with links to an earlier or higher quality thread that asks the same question.

- When responding to a post, search for similar posts and respond to the most pertinent thread. Redirect the other posts to the thread with your response and then close the redundant threads.

Off topic, inappropriate, or offensive posts

- Do not simply delete inappropriate or offensive posts. Instead, edit and explain why the posts were edited. Inappropriate posts include spoilers, solutions, and information on how to pirate educational materials.

- Check links that students post. If you find links to offensive sites and materials, they need to be edited quickly.

Bugs or errors

- Check to confirm that there is in fact an error.

- If not, suggest to the students that they check their work.

- If so, contact members of the course team, and notify the thread that the error has been reported.

- Use language that does not assign blame or discourage users from the platform.

  You might say: "Thanks for letting us know about that issue. We are working with edX to get it fixed as quickly as possible."

Feature requests

- Keep an organized collection of feature requests cultivated by the course team. That list can subsequently be shared with an edX product manager, who will log those requests internally.

- Reply to the post to let the person know that their request was heard, without promising that the feature will be implemented.

  You might say: "Thanks for your suggestion. I've logged it for review by edX staff, who will prioritize feature requests on the development roadmap."

- Search the discussions for other similar requests, and respond to and close those as well.

11.7 Bulk Email

For courses on edx.org, you can send bulk email messages to course participants directly from the Instructor Dashboard. Messages can use HTML styling, and can include links to videos, social media pages for the course, and other material. All course contributors who are assigned the Staff or Admin role can use bulk emails to communicate with course participants before, during, and after the course run.

This chapter contains the following topics.

- *Message Addressing*
- *Send Email Messages to Course Participants*
- *Use Keywords in Messages*
- *Message Workflow States*

- *Review Sent Messages*
- *Email Task History Report*
- *Example Messages to Students*

11.7.1 Message Addressing

When you send an email message from the Instructor Dashboard, you choose its recipients by selecting one of these predefined groups.

- **Myself**, to test out a message before sending it to a larger group.
- **Staff and admins**, to contact other members of the course team.
- **All (students, staff and admins)**, to communicate with currently enrolled students and the course team.

  Email messages are sent to all enrolled students with these exceptions:

  - Students who have not replied to the account activation email message that is sent when they registered on edx.org.
  - Students who have opted out of receiving email messages through the **Email Settings** link, which is present for each course on the **Current Courses** dashboard.

Before you use the bulk email feature, consider that messages **cannot be canceled** after they are sent. If you plan to send a message to all course participants, be sure to review each draft carefully, and send the message to yourself first for thorough testing.

11.7.2 Send Email Messages to Course Participants

To send an email message to course participants:

1. View the live version of your course.
2. Select **Instructor**, and then select **Email**.
3. Select who you want to send the message to from the **Send to** drop-down list. You can select:
 - **Myself**
 - **Staff and admins**
 - **All (students, staff and admins)**
4. Enter a **Subject** for the message. A subject is required.
5. Enter the text for the message. Message text is required.

   To include an image in your message, use the **Files & Uploads** page in Studio to add the file to your course, then click the **Insert/edit image** icon. For more information, see *Adding Files to a Course*.

   Messages can use HTML styling, including text formatting and links. The email message editor offers the same formatting options as the HTML component editor in Studio. For more information, see *Working with HTML Components*.

   You can use keywords in messages, to have values that are specific to each recipient substituted in the content when messages are sent. For more information, see *Use Keywords in Messages* .

6. Select **Send Email**. You can perform other tasks on the Instructor Dashboard or navigate to other pages while you wait for your message to be sent.

After you send a message, a bulk email task is queued for processing. Multiple courses use the same queue to complete these tasks, so it can take some time for your message to be sent to all of its recipients. If your course is a MOOC, consider limiting the number of messages that you send to all course participants to no more than one per week.

11.7.3 Use Keywords in Messages

You can include keywords in your messages. A keyword is a variable: when you send the message, a value that is specific to the each recipient is substituted for the keyword. For example, when you use the `%%USER_FULLNAME%%` keyword, each message contains the name of the recipient.

Note: Do not use keywords in the Subject line of a message. The keyword in the subject will not be assigned a value, and the recipient will see the keyword text.

Supported Keywords

You can use the following keywords in your messages.

- `%%USER_ID%%` - the anonymous user ID of the message recipient
- `%%USER_FULLNAME%%` - the full name of the message recipient
- `%%COURSE_DISPLAY_NAME%%` - the display name of the course
- `%%COURSE_END_DATE%%` - the end date of the course

Keyword Formatting

You format keywords as: `%%Keyword%%`. You can include keywords in any HTML tags in an email message. For example:

```
<h2>%%COURSE_DISPLAY_NAME%% Updates</h2>

<p>Dear %%USER_FULLNAME%%, this is a reminder that the last day of the course
   is <b>%%COURSE_END_DATE%%</b></p>
. . .
```

11.7.4 Message Workflow States

When you click **Send Email** for a message, the server begins to process a bulk email task. The server assigns a series of different workflow states to the task.
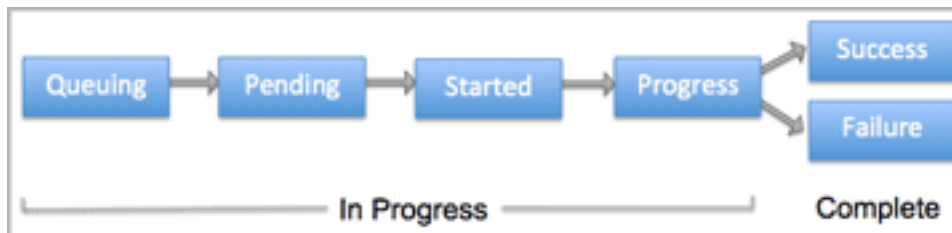
The workflow states for a bulk email task are:

- Queuing: The bulk email task is created and being queued for background processing.
- Pending: The task is queued and is waiting to run.

- Started: Background processing is in progress to create emailing subtasks.

- Progress: The emailing subtasks are in progress.

- Success: All emailing subtasks are complete. Note that the bulk email task can be in this state even if some or all of its emailing subtasks failed.

- Failure: An error occurred and task processing did not complete successfully.

While the bulk email task is in progress, you can find out how far it has gotten in the workflow by checking the **Pending Tasks** section on the **Email** page.

When the bulk email task is complete, you can find its final state by checking the Email Task History report. See *Email Task History Report*.

11.7.5 Review Sent Messages

You can review a list of all of the messages that have been sent for the course. For any listed message, you can review the subject, the username of the person who sent it, the date and time sent, its selected recipients, and the message text.

1. View the live version of your course.

2. Click **Instructor** then click **Email**.

3. In the **Email Task History** section of the page, click **Sent Email History**. The list of sent messages displays.

4. To review additional information for a message, click its subject. The message opens in a dialog box.
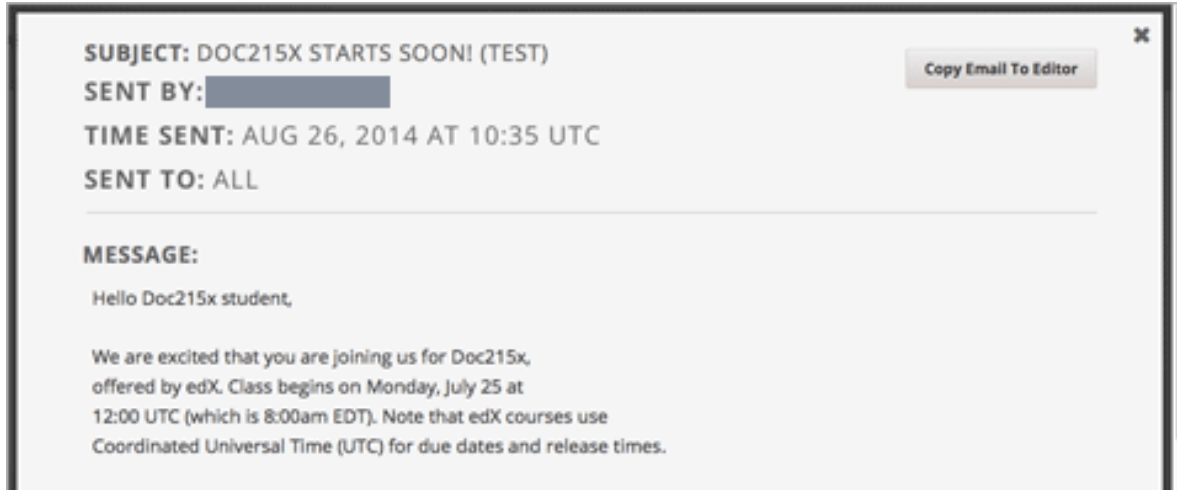
5. Optionally, use the message as the basis for a new message: click **Copy Email to Editor**. The dialog box closes and you can edit the text, links, and formatting that were duplicated into the **Subject** and **Message** fields.

   When you create a message by copying a previously-sent message, be sure to review and test it thoroughly before you send it to all course participants.

11.7.6 Email Task History Report

The Email Task History report can help you keep track of who sent messages, when, and to how many people. For each message sent, the report includes the username of the requester, the date and time it was submitted, the duration and state of the entire task, the task status, and the task progress.

You can use this history to investigate questions relating to bulk email messages that have been sent, such as:

- How frequently students are sent course-related email messages.

- Whether a message was sent successfully.

- The change in the number of people who were sent course-related messages over time.

To produce the Email Task History report:

1. View the live version of your course.

2. Click **Instructor** then click **Email**.

3. In the **Email Task History** section of the page, click **Show Email Task History**. A report like the following example displays on the Instructor Dashboard.

Review Email Task History

For tasks with a **State** of Success, the **Task Progress** column shows an informational message. These messages can have a format such as "Message successfully emailed for 13457 recipients (skipping 29) (out of 13486)". To interpret this message, note that:

- The first number ("recipients") indicates the number of messages sent to the selected recipients.

- The second number ("skipping") indicates the number of enrolled and activated users who were not sent the message. This count is of students who have opted not to receive course email messages.

- The final number ("out of") indicates the number of users in the set of recipients you selected who were enrolled in the course (and had activated their user accounts) when you sent the email message.

  Note that the **Total number of enrollees** shown on the **Course Info** page includes all currently enrolled students, regardless of account activation status, and as a result can be different than this number.

If the "recipients" and "out of" numbers are the same, the message reads "Message successfully emailed for 13457 recipients" instead.

Other **Task Progress** messages for tasks with a **State** of Success indicate that some or all of the emailing subtasks did not successfully send email:

- "Message emailed for {number succeeded} of {number attempted} recipients"

- "Message failed to be emailed for any of {number attempted} recipients"

- "Unable to find any recipients to be emailed"

No **Task Progress** messages display for tasks that have a **State** of Failure.

11.7.7 Example Messages to Students

You can use these example messages, prepared for delivery before typical course milestones, as models for your own course communications.

- *Prelaunch Reminder*
- *Launch Day Welcome*
- *Verified Registration Reminder*
- *Weekly Highlights*
- *Midcourse Encouragement*
- *Midcourse Events*
- *Technical Issue*
- *Course Farewell and Certificates*
- *New Course Run Announcement*

These messages are styled as email messages, but you could also post this information in a course discussion topic or on the **Course Info** page. To use *keywords*, you must send email messages; keywords are not supported in discussion topics or the **Course Info** page.

Important: Revise these message templates carefully to include facts for your own course, meet the needs of your students, and reflect your own objectives and personality. Search for the "{" and "}" characters to locate prompts and replace them with course-specific values.

Some of these messages also contain *keywords*. Values specific to your course and the recipients will be substituted for the keywords when you send the messages. Ensure you are using keywords appropriately for your course and objectives.

Pre-launch Reminder

Pre-launch reminders raise awareness of the course start date, publicize the course, and generate excitement. In addition to the course start date and time, the example that follows also lets students know that:

- UTC is used in edX courses. Alternatively, you could include information about your course or the edX platform that will contribute to your students' success.

- The course has a companion social media site. Alternatively, you might include information about planned meetups or other community-building opportunities.

You may want to send out more than one message before the course launches: use this template as a starting point for crafting the different messages you want to deliver. Replace values enclosed by {braces} with information that applies to your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course number} Starts Soon!

Hello %%USER_FULLNAME%%,

We are excited that you are joining us for {course number}
%%COURSE_DISPLAY_NAME%%, offered by {organization name} through edX. Class
begins on {day}, {date} at {time} UTC (which is {time} {local time zone}).
Note that edX courses use Coordinated Universal Time (UTC) for due dates and
release times.

In case you haven't already found it, {course number} has its own official
Facebook page {add link}. You can find videos and photos posted there before
the course even begins.

If this is your first edX course, consider enrolling in the edX Demo course
{add link}. This course gives you an opportunity to explore the edX platform
and learn how to answer problems and track your progress, before {course
number} begins.

Your {course number} course staff
```

Launch Day Welcome

On your course start date, you can send an email message that both welcomes students and gives them specific actions to accomplish. This example directs students to two of the course pages to encourage exploration and discovery, and personally introduces the course team leader. Search for the values enclosed by {braces} in this template and replace them with information for your course.

```
Subject: {course number} Starts Today!

Hello everyone!

At this time, edX course {course number} is available from your Dashboard
{add link}, and the staff would like to officially welcome you to the course!
You'll find materials for the first week on the Courseware page,
including both video lectures and problem sets.
```

```
Please take some time to go to the Course Info page to read the handouts
and get familiar with course policies and philosophy.

I will be your course lead and I hope you will all have a great time learning
{subject}! It may be challenging, it may be frustrating, but it will be
rewarding and you will learn a ton.

On behalf of the staff, welcome, good luck, and have fun!

{name} and the {course number} staff
```

Reminder to Register for Verified Certificate

After your course has launched, you can send an email to remind students that the last day to register for a verified certificate is approaching. You can use this template as a starting point for your own message; search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: Earn an edX verified certificate for {course name}!

Dear %%USER_FULLNAME%%,

Interested in using an edX certificate to bolster a college application or to
advance your career? With an edX verified certificate, you can demonstrate to
colleges, employers, and colleagues that you successfully completed a
challenging edX course, while helping to support the edX mission.

We would like to remind you that {date} is the last day to register for a
verified certificate in %%COURSE_DISPLAY_NAME%%. Registering for a
certificate is easy! Just go to this course on your edX dashboard and click
"Challenge Yourself".

Good luck!

{name} and the {course number} staff
```

Weekly Highlights

Sending a weekly email to students can be a great way to keep them engaged and provide encouragement. At the end of each week you might send students an email that summarizes the content covered, and reminds students about upcoming assessments or milestones in the course. Optionally, to encourage participation in the discussion forums, you might also highlight particularly interesting or important discussions, and provide links to the discussion topics.

You can use this template as a starting point for designing your own message, omitting the discussion highlights if they are not appropriate for your course (the example discussion highlights are from a course about urban solutions to the global water crisis). Search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {Course Name} Week 1 Highlights

We hope you all had a great week! Below, we have provided links to some
exciting discussions that have been going on, and a Q&A video with
{Professor} that recaps some of the questions that have come up this week.

We'd also like to remind you to take this week's quiz by {date} at {time} UTC.
```

```
The next module will be available on {Time and Date}.

{Link to Video}

Here are a few highlights from the discussion forum this week. Please join us
online and keep the conversation going!

* There has been quite a debate over whether urban stream restoration is
  possible and what types of restoration are desirable. How can we improve
  restoration practice and its outcomes? {Link to the Discussion}

* Please continue to share your stories of urban stream restoration - there
  are many great examples here of what is possible! {Link to the Discussion}

See you next week,
{name} and the {course number} staff
```

Mid-Course Encouragement

While your course is running, you can send messages to promote community, remind students of upcoming due dates, and address any recurring issues.

This example gives students guidance on how to keep up with the course schedule and encourages contributions to the discussions. You may want to send out more than one message while the course is running. You can use this template as a starting point for your own messages; search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course name} Announcements

Dear students,

We hope that you are learning a lot in {course number}! Remember that problem
set {number} is due on {date} at {time} UTC. You can always check the
schedule {add link} on the Course Info page to plan ahead.

The contributions to the course discussions have been amazing. You'll also
see on the Course Info page that we have made several of you community
TAs to thank you for your thoughtful contributions. Keep those conversations
going!

We have a few additional announcements.

* Week {number} on {subject} is now available on the Courseware page.

* Problem set {number} is also available. It is due on {date} at {time} UTC.

* Remember that the due dates for problem sets and exams are in UTC (the GMT
  time zone). See the current UTC time here {add link}. Please convert the
  times given to your own time zone!

Wishing you continued success in the course,

{name} and the {course number} staff
```

Mid-Course Event

Before an exam or other significant course event, messages can provide practical information about the exam, communicate expectations regarding conduct, and also encourage students to continue working toward course completion. This example lets students know:

- How long they have to complete the exam, and when they can see answers to questions.

- How to communicate any errors or other issues found during the exam to the course staff.

- Whether the course discussions will be open or closed during the exam. (In the example that follows, the discussions will remain **open**.)

- What constitutes an honor code violation.

- What technical limitations, if any, are imposed by external tools such as graders.

Be sure to search for the values enclosed by {braces} and replace them with information for your course. In addition, check that you are using *keywords* appropriately.

```
Subject: {course number} Exam Info

Hello %%USER_FULLNAME%%,

Great job working through week {number}! As you know, the {course number}
exam is next week. If you missed a problem set, you can still earn a
certificate. Each problem set is worth only {number}% of the overall grade,
but this exam is worth {number}%.

Please read this important information about the exam before you begin taking
it.

* The exam starts on {date} at {time} UTC and must be finished by {date} at
  {time} UTC. Plan your schedule accordingly.

* Be sure that you know what time the UTC deadline is in your time zone. See
  the current UTC time {add link}. No extensions will be given.

* The exam is not timed. You can start, stop, and come back to it until the
  deadline.

* Each exam question allows only one answer submission. If you accidentally
  click "Check", that problem cannot be reset for you.

* The exam covers everything (video lectures, reading, and problem sets) from
  weeks {number}-{number}. If you missed any of these materials, you will
  want to review them before you take the exam.

* You can use the textbook and the Internet to clarify your knowledge of exam
  topics, as long as you are not deliberately looking up answers to exam
  questions.

* Course discussions will remain open during the exam, but anyone who posts
  an answer to an exam question will be violating the honor code and risk
  being removed from the class, forfeiting the certificate.

* If you need to alert the staff to an issue with the exam while the exam is
  open, add a post to the General discussion topic and include [EXAM] in
  the subject line.
```

```
* Check the Course Info page periodically. It is the fastest way the
  staff has to communicate any delays, corrections, or changes.

Good luck!

{name} and the {course number} staff
```

Technical Issue

In the event of an unanticipated system failure, a message can both alert students to the problem and reassure them that the issue is either resolved or being addressed. The message can also provide information about any changes made to the course as a result.

Technical issues can arise during a course for many different reasons, so this example is likely to need revision to apply to an issue that you encounter. Keep in mind that to reassure the students who are affected by the problem, the message should have a positive tone, and calmly and briefly identify the problem, the status of its solution, and any after effects.

```
Dear students,

We've encountered a technical problem with {video, assignment, etc. name}.
{We are working to resolve it now. / This issue has been fixed.}

As a result of this issue, we have {extended the deadline for / rescored}
this assignment so that it will not affect your grade.

Thanks for your patience, and we look forward to continuing the course with
you.

{name} and the {course number} staff
```

Course Farewell and Certificates

In the last few days before your course ends, a message can direct students to a course survey, answer questions about certificates, and provide information about future access to course materials. Be sure to replace values enclosed by {braces} with information for your course.

```
Subject: {course number} Final Remarks

Dear %%USER_FULLNAME%%,

Thank you for making %%COURSE_DISPLAY_NAME%% so much fun these last few
months! We had a great time getting to know you through the course
discussions. We appreciate the effort that you put into this course, and we
hope that you enjoyed learning {subject} through edX. With or without a
certificate, you should be proud of your accomplishments.

* Please take a few minutes to answer the exit survey, now available under
  Courseware. We will use your responses to improve the course in the future.

* If you qualify for a certificate (overall score {number}% or higher), the
  edX dashboard will include a link to your certificate in the near future.
  While you may see the link in a few days, it can take up to two weeks edX
  to generate all of the course certificates.

* As an enrolled student, you will have access to the lecture videos even
```

```
  after the course ends. The problem sets and exams will be removed from the
  course when it is archived.

* The {course number} discussions close on {date} at {time} UTC. You will not
  be able to add to the discussions after that time, but you will be able to
  continue viewing all of the conversations that took place during the
  course.

We hope that you share what you learned in {course number} with your
colleagues, friends, and family.

Good luck on the final exam and beyond!

{name} and the {course number} staff
```

New Course Run Announcement

When you prepare a course for a new run, you can use the bulk email feature in its previous run (or runs) to inform an engaged and knowledgeable audience: your former students. Announcing a new run to students of an earlier run gives you the opportunity to highlight key aspects of the course, such as the quality and variety of its discussions, or the global interest and relevance of the subject, as demonstrated by past enrollment. You can also reveal new features or content that have been added to the new course run. By emphasizing the value of the course, you get people thinking and talking about their experiences, build excitement, and encourage re-enrollment.

This message template offers students who did not complete the course, or who did not previously choose the verified certificate track, the opportunity to do so. It also invites students to share the course with colleagues and and friends.

When preparing a message from this template, search for values enclosed by {braces} and replace them with information that applies to your course.

```
Subject: Announcing a new run of {course name}

Hello {course number} learners,

The next run of {course number} {course name} begins on {date}! We are glad
to share this news with you, the students who made the earlier run{s} of
{course number} so successful.

{Success story from the previous run.}

{New content or features for the upcoming run.}

Perhaps you want to share the {course name} experience with a friend or
colleague, earn an ID-verified certificate of achievement, or work through
course content that you weren't able to complete before. When {course number}
is offered in {time frame}, we welcome you to join the community of learners
again.

To learn more and to enroll, visit the {course name} page {add link}.

We hope to see you in the course,

The {course number} Staff
```

11.8 Using the Course Wiki

Wikis provide a way for the course team and students to access, share, and collaboratively edit information both about, and for, your course.

Every course has a wiki that you can set up in a way appropriate for your course. If you have specific expectations for how the wiki should be used, communicate these expectations to your students and staff. You can *seed the wiki* with specific content and provide a skeleton structure and some exemplars. At the beginning of the course, explain how you want the course wiki to be used, and provide clear instructions and guidelines for its use.

Common uses for the course wiki might include the following activities.

- Sharing answers to course FAQs and collecting new FAQs.
- Sharing editable course information, such as download and installation instructions for software required for the course
- Providing shared access to student-created resources, perhaps as part of a collaborative exercise.
- Sharing errata for the course.
- Collecting suggestions for future runs of the course.

As students and course team members create and edit wiki articles, they contribute to a repository of information about your course that can be immediately useful to other students, or useful for you and your course team as you develop other courses or future runs of the same course.

The wiki for each course is a "child" wiki of the edX-wide wiki. From within any course wiki, clicking the top level **Wiki** link in the breadcrumb trail at the top of the page takes you to the edX-wide wiki.

11.8.1 Managing the Course Wiki

Keep these points in mind as you design the wiki for your course:

- Be clear about the purpose for the wiki or for different parts of the wiki. For example, are some parts of the wiki only for disseminating information? If that is the case, then make sure that only your course team has write access for those articles.
- Decide whether some parts of the wiki are intended for student collaboration or student input. Make sure that students are able to create and edit wiki articles in those sections, and use text to clearly indicate to students that these pages can be edited.
- Think about the different tasks that will be performed by people in different roles. Typically you want your course team to have some privileges that students do not have. For example, course team members can delete wiki articles, but students cannot.

Members of the course team can perform these tasks to manage the wiki.

- *Show or Hide the Wiki*
- *Control Wiki Access*
- *Seed the Wiki*
- *Lock a Wiki Article*
- *Delete a Wiki Article*
- *Purge a Wiki Article*
- *Restore a Deleted Wiki Article*

All users, including students, can perform the following tasks, depending on the permissions that you set for an article:

- *Add a Wiki Article*

- *Edit a Wiki Article*

- *Manage Versions of a Wiki Article*

- *Search for Wiki Articles*

11.8.2 Showing or Hiding the Wiki

When you create a course, a wiki is included by default, and a **Wiki** tab is visible at the top of the course page. If you do not want to use the course wiki, you can hide the **Wiki** tab at the top of the course.

Follow these steps to show or hide the wiki in the course tabs.

1. Open your course in Studio.

2. Select **Content**, then **Pages**.

3. Click the eye icon in the **Wiki** row. The **Wiki** tab is hidden when the eye icon has a slash through it. You can show the **Wiki** tab again by clicking the eye icon.

When you hide the wiki in your course, any existing articles remain in the edX- wide wiki, but the **Wiki** tab is removed from your course pages.

11.8.3 Controlling Access to the Wiki

You can control access to the wiki in various ways: by changing access to the wiki as a whole, by changing the read/write permissions settings of articles within the wiki, or by locking articles.

To change access to the course wiki:

1. Open your course in Studio.

2. Select **Settings**, then **Advanced Settings**.

3. Scroll down to the **Allow Public Access to Wiki** field. This Boolean setting is set to False by default, meaning that only course team members and enrolled students can see the course wiki. If you change the value of this field to True, then any registered edX user can access the course wiki, even if they are not enrolled in your course. However, public users would have to explicitly navigate to your wiki via the edX-wide wiki structure, or a link that has been provided to them.

To modify viewing or editing permissions for specific groups of users by article, see *Setting Permissions for Wiki Articles*.

To lock an article and prevent further editing, see *Locking a Wiki Article*.

11.8.4 Setting Permissions for Wiki Articles

To prevent certain groups of users from being able to add or edit articles, you need to modify the read/write permissions for articles. For example, as a member of the course team, you likely want to prevent students from creating wiki articles at the top level, so you should remove write access to course- level wiki articles for most users. (Top-level wiki articles are children of the edX-wide wiki, and cannot be found within the course wiki).

To modify the permissions for wiki articles, follow these steps.

1. View the live version of your course.

2. Click **Wiki**.

3. Navigate to the article whose permissions you are modifying, then click **Settings**.

4. In the **Permissions** section of the **Settings** page, select or clear the checkboxes for read or write access for **Group** or **Other**.

5. At the bottom of the page, click the **Save changes** button for the **Permissions** section.

Note that there are two different **Save changes** buttons, one near the top of the page for the **Notifications** section, and one at the bottom of the page for the **Permissions** section. If you are modifying permissions, make sure you click the **Save changes** button at the bottom of the page for your changes to be saved.

Groups Used in Wiki Permissions

There are three groups for each course, managed by adding users to these groups on the **Membership** page of the Instructor Dashboard:

- Beta Testers (by default there are no beta testers until you add them)

- Admins (by default, the course author is always in this group)

- Staff (these are course team members)

The permissions for the **Others** group apply to users who are not in the three course groups, including students.

11.8.5 Seeding the Wiki

To ensure that students get the most out of your course wiki, design the wiki space before the course starts by seeding the course wiki with articles that give it the desired structure.

For example, you could create wiki articles to mirror the course outline. At the top level, you could provide a course outline, FAQs, and links to the main articles for each section. In the child articles for each section, you could provide information specific to the units and components in that section, and a page for students to share their feedback and experiences.

11.8.6 Adding a Wiki Article

When you add an article to the wiki, be aware of what level you are currently viewing, to make sure that you add your new article to the correct level in the course wiki.

To move down a level in the wiki, click the **See all children** link; to move up, click the appropriate level in the wiki breadcrumb trail links at the top of the page.

Add Articles at the Same Level

Follow these steps to add a wiki article at your current level. If you do not have permissions to add an article, when you click the **Add Article** button, a message indicates "Permission Denied" .

1. In your course, click **Wiki**.

2. Navigate to the level where you want to add a new article.

3. Click the **Add Article** button near the top right of the page.

4. On the new article page, add a title for the page, and optionally a few keywords to create a "slug" that provides a more specific location identifier for your article.

5. Add contents to the article. You can enter plain text and use Markdown syntax to add formatting. For help with Markdown syntax, click the link to the cheat sheet at the upper right corner of the **Contents** field.

6. When you have finished entering content for your wiki article, click **Create Article**.

Add Articles Below the Current Level

Follow these steps to add a child article to your current article. If you do not have permissions to add an article, when you click the **Add Article** button, a message indicates "Permission Denied" .

1. In your course, click **Wiki**.

2. Navigate to the level above where you want to add the new child article.

3. Click **See all children**.

4. Click the **Add Article** button under the wiki title.

5. On the new article page, add a title for the page, and optionally a few keywords to create a "slug" that provides a more specific location identifier for your article.

6. Add contents to the article. You can enter plain text and use Markdown syntax to add formatting. For help with Markdown syntax, click the link to the cheat sheet at the upper right corner of the **Contents** field.

7. When you have finished entering content for your wiki article, click **Create Article**.

11.8.7 Editing a Wiki Article

If you have permissions to edit an article, you see an **Edit** button and icon to the right of the article content.

Follow these steps to make changes to a wiki article.

1. In your course, click **Wiki**.

2. Navigate to the article you want to edit.

3. Click **Edit**.

4. Make your changes. For help with Markdown syntax, click the link to the cheat sheet at the upper right corner of the **Contents** field.

5. In the **Summary** field at the bottom left, below the **Contents** field, enter a short description of the changes you made. This description appears in the **Changes** list, and helps other users of the wiki understand what changes you made to the article.

6. When you have finished making edits, click **Save changes**.

11.8.8 Searching for Wiki Articles

A **Filter** field is available only if any level of the wiki contains multiple articles.

Enter a text string in the **Filter** field to find a list of all articles with that text string in their titles.

11.8.9 Managing Versions of Wiki Articles

The wiki includes a change history for each article. You can view each past version of the article, roll back to a selected earlier version of the article, or merge the current version of the article with a selected earlier version.

View a List of Previous Versions of a Wiki Article

1. In your course, click **Wiki**.

2. Navigate to the wiki article for which you want to see the change history.

3. Click **Changes**. Previously saved versions of the current article are listed, with the most recent at the top.

View a Previous Version of a Wiki Article

1. On the **Changes** page for your wiki, select the revision of the article that you want to view.

2. Click **Preview this revision** to see the article as it appeared after the revision was made.

See Line by Line Changes in a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to view.

2. Click the linked date, time, and author information to see the line-by-line changes made in that revision. Text that is highlighted in red has been replaced by the text that is highlighted in green below it.

Replace a Current Version with a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to roll back to.

2. Click **Switch to selected version** to replace the current version with the selected one.

Combine a Current Version with a Previous Version

1. On the **Changes** page for your wiki, select the revision of the article that you want to merge with the current version.

2. Click **Merge selected with current** to combine the current and the selected versions.

11.8.10 Locking a Wiki Article

Locking a wiki article prevents further changes from being made to it. Follow these steps to lock a wiki article either after you create it, or after you make specific edits.

1. View the live version of your course.

2. Click **Wiki**.

3. Navigate to the article you want to lock, then click **Settings**.

4. In the **Permissions** section of the **Settings** page, select the **Lock article** checkbox.

5. At the bottom of the page, click the **Save changes** button for the **Permissions** section.

11.8.11 Deleting a Wiki Article

Only course team members can delete articles. In addition, you can only delete an article if you have permissions to edit that article. If you have the required permissions, you see a **Delete article** button at the bottom of the **Edit** page.

Follow these steps to delete an article:

1. View the live version of your course.

2. Click **Wiki**.

3. Navigate to the article you want to delete, then click **Edit**.

4. Click **Delete article**.

5. On the deletion confirmation page, select **Yes, I am sure**.

6. Optionally, also select the **Purge** checkbox. For details, see *Purging a Wiki Article*.

7. Click **Delete article** to confirm the deletion.

Purging a Wiki Article

When you delete and purge an article, it is completely removed from the wiki, with no option to undo the deletion. Select this option only if you are sure you will not want to restore the content.

To purge an article as you delete it, select the **Purge** checkbox on the deletion confirmation page.

Restoring a Deleted Wiki Article

Articles that have been deleted but not purged can be restored. A link to the article remains visible at the level at which it was created.

To restore a deleted article, click the link to the article and click **Restore**.

11.9 Course Data

After you create a course, you can access information about it from the Instructor Dashboard. You can find:

- Identifying information for the course.
- Whether the course has started or ended.
- The defined grade cutoff for passing or failing.

Additional data about the course and its students is available from other pages in the Instructor Dashboard, and from edX Insights. You also access Insights from the Instructor Dashboard: click the link in the banner at the top of each page. For more information, see Using edX Insights.

11.9.1 Review Course Data

To view course data:

1. View the live version of your course.

2. Click **Instructor**, then click **Course Info** if necessary.

   The **Basic Course Information** section of the page that opens lists information about the course.

BASIC COURSE INFORMATION

- Organization: **edX**
- Course Number: **edx204**
- Course Name: **2014_Q2**
- Course Display Name: **Introduction to Data Analytics**
- Has the course started? **No**
- Has the course ended? **No**
- Grade Cutoffs: **Pass: 0.5**

11.9.2 Sources in Studio of the Basic Course Information

The course data that displays on the Instructor Dashboard is defined in Studio, or derived from data that you define in Studio.

- **Organization**: Specified in Studio when you create the course. Becomes part of the course URL, and cannot be changed.

- **Course Number**: Specified in Studio when you create the course. Becomes part of the course URL, and cannot be changed.

- **Course Name**: Specified in Studio when you create the course. Becomes part of the course URL, and cannot be changed. In Studio, this field is labeled **Course Run**.

- **Course Display Name**: Specified in Studio when you create the course. In Studio, this field is labeled **Course Name**.

  This name can be changed in Studio (not recommended if your course is live): From the **Settings** menu select **Advanced Settings**. The value for the **Course Display Name** policy key defines the course name that appears in the LMS only.

  The illustration that follows shows the information collected by Studio for a new course side-by-side with the same information in the **Basic Course Information** section of the Instructor Dashboard.

- **Has the course started**: Derived from the **Course Start Date** and the current date. This date can be changed in Studio (not recommended if your course is live): select **Settings > Schedule & Details**.

- **Has the course ended**: Derived from the **Course End Date** and the current date. This date can be changed in Studio (not recommended if your course is live): select **Settings > Schedule & Details**.

- **Grade Cutoffs**: Specified in Studio when you define the cutoff for a failing grade. Students who earn exactly the cutoff value pass the course. Grading can be changed in Studio (not recommended if your course is live): select **Settings > Grading**.

11.10 Student Data

You can access data about the individuals who are enrolled in your course at any time after you create the course.

Section Contents:

- *Guidance for Working with Personal Information*
- *Accessing Student Data*
    - *Student-Reported Data*
    - *Download or View Student Data*
- *Accessing Anonymized Student IDs*

To supplement the student data available from the Instructor Dashboard, you can use the charts and reports that are available from edX Insights. With Insights, you can monitor student activity and review the number of students who, each week, interacted with your course. For more information, see Using edX Insights.

11.10.1 Guidance for Working with Personal Information

The information that edX collects from site registrants includes personal information that can be used to identify, contact, and locate individuals. This information is available to course authors for the students who are enrolled in their courses.

Members of the course team should follow the policies established by their organizations and comply with the legal requirements of their locales to prevent public distribution or misuse of this information.

11.10.2 Accessing Student Data

You can download data about the students who are currently enrolled in your course in a CSV (comma-separated values) file. For courses that have fewer than 200 students enrolled, you can also view data for enrolled students on the Instructor Dashboard.

For information about course enrollment, see *Enrollment*.

Student-Reported Data

When students register with edX, they select a public username and supply information about themselves. Most of this information is optional, so not all of the students who are enrolled in your course provide it.

Students then enroll in as many individual courses as they choose, which enrolls them in each selected course.

You can access this self-reported information for all of the students who are enrolled in your course.

- username
- name

- email

- year_of_birth

- gender

- level_of_education. For more information about the reported values, see auth_userprofile.level_of_education column in the *edX Research Guide*.

- mailing_address

- goals

The student data that is available to course team members always reflects the set of live, current enrollments. Students can enroll in your course throughout the defined enrollment period, and they can unenroll from a course at any time. Students can also change their email addresses and full names at any time. As a result, you may want to download student data periodically to gain insights into how the student population changes over time.

Note: In the future, edX may also request that students select a language and location. This data is not collected at this time.

Download or View Student Data

You can download a report of student data to learn about the individuals who are enrolled in your course. In addition to the self-reported data collected at registration, this report includes the user account ID numbers that edX assigns to each registrant. For courses that include student cohorts, this report includes the cohort group that is assigned to each student.

When you choose to download student data, a process starts on the edX servers. The number of students enrolled in your course, and whether your course has the cohort feature enabled, affect how long this process takes. You can download a report of student profile information in a CSV (comma-separated values) file after the process is complete.

For courses with fewer than 200 students enrolled, you also have the option to view student data on the Instructor Dashboard.

Note: In addition to the data for enrolled students, data for the course team is included in the file or display.

To download student data, follow these steps.

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. To download data about enrolled students in a CSV file, click **Download profile information as a CSV**.

   A status message indicates that report generation is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

   To track the progress of the report process, reload the page in your browser and scroll down to the **Pending Tasks** section.

4. To open or save a student data report, click the `{course_id}_student_profile_info_{date}.csv` file name at the bottom of the page.

   All student-supplied data is included in this file without truncation.

To view student data, follow these steps.

Note: This option is available only for courses with an enrollment of less than 200.

---

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. To display data about enrolled students, click **List enrolled students' profile information**.

   A table of the student data displays, with one row for each enrolled student. Longer values, such as student goals, are truncated.

For courses that have the cohorts feature enabled, this report also includes a Cohort column with each student's assigned cohort group.

Note: The columns for language and location are included in this report for backward compatibility only. This data is no longer collected during student registration.

11.10.3 Accessing Anonymized Student IDs

Some of the tools that are available for use with the edX platform, including external graders and surveys, work with anonymized student data. If it becomes necessary for you to deanonymize previously anonymized data, you can download a CSV file to use for that purpose.

To download a file of assigned user IDs and anonymized user IDs:

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. Click **Get Student Anonymized IDs CSV**.

You are prompted to open or save the {course-id}-anon-id.csv file for your course. This file contains the user ID that is assigned to each student at registration and its corresponding edX-wide anonymized user ID and course specific anonymized user ID. Values are included for every student who ever enrolled for your course.

To research and deanonymize student data, you can use this file together with the {course_id}_student_profile_info_{date}.csv file of student data or the {course_id}_grade_report_{date}.csv file of grades.

11.10.4 Using the Learner Engagement Report

With the learner engagement report, you can monitor what individual learners are doing in your course. The report contains a row for each enrolled learner, and has columns that quantify overall course activity and engagement with course problems, videos, discussions, and textbooks.

With this report, you can identify which learners are, and which are not, visiting course content. Further, you can identify the learners who are attempting problems, playing videos, participating in discussions, or viewing textbooks.

The server generates a new learner engagement report every day for the previous day's activity. On Mondays, an additional report is generated to summarize activity during the previous week (Monday through Sunday).

Understanding the Learner Engagement Report

Reported Problem Types

To measure problem-related activity, the learner engagement report includes data for capa problems. That is, the report includes data for problems for which learners can select **Check**, including these problem types.

- Checkboxes
- Custom JavaScript
- Drag and Drop
- Dropdown
- Math expression input
- Multiple choice
- Numerical input
- Text input

The report does not include data for open response assessments or LTI components.

For more information about the problem types that you can add to courses, see *Creating Exercises and Tools*.

Report Columns

The learner engagement report .csv files contain the following columns.

Column	Description
Date	Included only in the daily report. The date of the reported activity.
End Date	Included only in the weekly report. The last date of the report period.
Course ID	The identifier for the course run.
Username	The unique username for an edX account.
Email	The unique email address for an edX account.
Cohort	Indicates the learner's assigned cohort. Blank if the learner is not assigned to a cohort.
Was Active	Included only in the daily report. 1 for learners who visited any page (URL) in the course at least once during the reported day, 0 otherwise.
Days Active This Week	Included only in the weekly report. Identifies the number of days during the week that the learner visited any page (URL) in the course.
Unique Problems Attempted	The number of unique problems for which the learner selected **Check** to submit an answer.
Total Problem Attempts	The number of times the learner selected **Check** to submit answers, regardless of the particular problem attempted.
Unique Problems Correct	The number of unique problems for which the learner submitted a correct answer.
Unique Videos Played	The number of times the learner played a video. Each video that the learner began to play is included in this count once.
Discussion Posts	The number of new posts the learner contributed to the course discussions.
Discussion Responses	The number of responses the learner made to posts in the course discussions.
Discussion Comments	The number of comments the learner made on responses in the course discussions.
Textbook Pages Viewed	The number of pages in a .pdf textbook that the learner viewed.
URL of Last Subsection Viewed	The URL of the last subsection the learner visited.

Download the Learner Engagement Report

An automated process runs daily on the system server to update learner engagement data and create the daily or weekly .csv file for you to download. Links to the .csv files are available on the Instructor Dashboard.

To download a learner engagement report, follow these steps.

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. At the bottom of the page, click the `student_engagement_daily_{date}.csv` or `student_engagement_weekly_{end date}.csv` file name. You might have to scroll down to find a specific file.

11.11 Answer Data

To review student answers to the problems in your course, you can review the answer submitted by a selected student for a specific problem or download a course-wide report of answer data.

- *Check a Student's Answer Submission and Submission History*
- *Student Answer Distribution*

Student answer distribution data, including both charts and reports, is also available from edX Insights. For more information, see Using edX Insights.

11.11.1 Check a Student's Answer Submission and Submission History

For a single student and problem, you can review the exact response submitted, the number of attempts made, and the date and time of the submission. You identify the student by supplying a username.

To review a response submitted by a student, follow these steps.

1. View the live version of your course.

2. Select **Courseware** and navigate to the unit that contains the problem you want to review.

3. Display the problem, and then select **Submission History** below the problem.

4. Enter the username for the student whose work you want to review, and then select **View History** at the end of the page.

   Information about the response or responses provided by the student displays.

To close the Submission History Viewer, click on the browser page outside of the viewer.

11.11.2 Student Answer Distribution

For certain types of problems in your course, you can download a CSV file with data about the distribution of student answers. Student answer distribution data is included in the file for problems of these types.

- Checkboxes (`<choiceresponse>`)

- Dropdown (`<optionresponse>`)

- Multiple choice (`<multiplechoiceresponse>`)

- Numerical input (`<numericalresponse>`)

- Text input (`<stringresponse>`)

- Math expression input (`<formularesponse>`)

The file includes a row for each problem-answer combination selected by your students. For example, for a problem that has a total of five possible answers the file includes up to five rows, one for each answer selected by at least one student. For problems with **Randomization** enabled in Studio (sometimes called rerandomization), there is one row for each problem-variant-answer combination selected by your students. See *Problem Settings*.

The CSV file contains the following columns.

Column	Description
ModuleID	The internal identifier for the Problem component.
PartID	For a Problem component that contains multiple problems, the internal identifier for each individual problem. For a Problem component that contains a single problem, the internal identifier of that problem.
Correct Answer	0 if this **AnswerValue** is incorrect, or 1 if this **AnswerValue** is correct.
Count	The number of times that students entered or selected this answer as their most recent submission for the problem or problem variant. For problems with the number of **Attempts** set to a value greater than 1, this means that each student contributes a maximum of 1 to this count, even if the same answer is provided in multiple attempts.
ValueID	The internal identifier of the answer choice for checkboxes and multiple choice problems. Blank for dropdown, numerical input, text input, and math expression input problems.
AnswerValue	The text label of the answer choice for checkboxes, dropdown, and multiple choice problems. The value entered by the student for numerical input, text input, and math expression input problems.
Variant	For problems that use the **Randomization** setting in Studio, contains the unique identifier for a variant of the problem. Blank for problems that do not use the **Randomization** setting, or that use the **Never** option for this setting.
Problem Display Name	The **Display Name** defined for the problem.
Question	The accessible label that appears above the answer choices or the text entry field for the problem. In Studio's Simple Editor, this text is surrounded by two pairs of angle brackets (>>Question<<). Blank for questions that do not have an accessible label defined.

Entries are sorted by the value in each column, starting with the ModuleID on the left and continuing through the columns to the right.

Download the Student Answer Distribution Report

An automated process runs periodically on the edX servers to update the CSV file of student answer data. A link to the most recently updated version of the CSV file is available on the Instructor Dashboard.

To download the most recent file of student answer data, follow these steps.

1. View the live version of your course.

2. Select **Instructor**, and then select **Data Download**.

3. At the bottom of the page, select the `{course_id}_answer_distribution.csv` file. You may have to scroll down to find this file.

Frequently Asked Questions about the Student Answer Distribution Report

Answers to questions about the student answer distribution report follow.

My course doesn't have a student answer distribution report. How can I generate it?

Student answer distribution reports are generated automatically, and refreshed several times each day. The `{course_id}_answer_distribution.csv` file displays after all of the `{course_id}_grade_report_{date}.csv` files. Be sure to scroll to the end of the list of available reports.

Why are some problems missing from this report? The ones that are missing do have the problem types listed under *Answer Data*.

This report includes only problems that at least one student has answered since early March 2014. For those problems, this report only includes activity that occurred after October 2013.

Why don't I see an AnswerValue for some of my problems?

For checkboxes and multiple choice problems, the answer choices actually selected by a student after early March 2014 display as described in the previous answer. Answer choices selected by at least one student after October 2013, but not selected since early March 2014, are included on the report but do not include an **AnswerValue**. The **ValueID** does display the internal identifiers, such as choice_1 and choice_2, for those answers.

Why don't I see a Question for some of my problems?

The value in the **Question** column is the accessible label for the problem. For more information about how to set up labels for problems, see *Creating Exercises and Tools*.

Also, for problems that use the **Randomization** setting in Studio, if a particular answer has not been selected since early March 2014, the **Question** is blank for that answer.

My students are saying that they answered a question, but it isn't showing up in the report. How can that be?

Only questions that have a **Maximum Attempts** setting of 1 or higher are included on the report.

I made a correction to a problem after it was released. How can I tell which students tried to answer it before I made the change?

Problem **Count** values reflect the entire problem history. If you change a problem after it is released, it may not be possible for you to determine which answers were given before and after you made the change.

Why is the same answer showing up in two different rows when I view the report in a spreadsheet?

Some spreadsheet applications can alter the data in the CSV report for display purposes. For example, for different student answers of "0.5" and ".5" Excel correctly includes the two different lines from the CSV, but displays the **AnswerValue** on both of them as "0.5". If you notice answers that appear to be the same on separate lines with separate counts, you can review the actual, unaltered data by opening the CSV file in a text editor.

Why are there strange characters in the report when I view it in a spreadsheet?

The CSV file is UTF-8 encoded, but not all spreadsheet applications interpret and render UTF-8 encoded characters correctly. For example, a student answer distribution report with answer values in French displays differently in Microsoft Excel for Mac than in OpenOffice Calc.

Answer Values in Microsoft Excel for Mac:

ValueID	AnswerValue
choice_0	J'ai particip_ _ la discussion.
choice_0	J'ai regard_ la vid_o: "Une focale sur la non-democratie"
choice_2	le politique
choice_0	le pouvoir
choice_1	l'_conomie

Answer Values in OpenOffice Calc:

ValueID	AnswerValue
choice_0	J'ai participé à la discussion.
choice_0	J'ai regardé la vidéo: "Une focale sur la non-democratie"
choice_2	le politique
choice_0	le pouvoir
choice_1	l'économie

If you notice characters that do not display as expected in a spreadsheet, try a different spreadsheet application such as LibreOffice or Apache OpenOffice to open the CSV file.

Interpret the Student Answer Distribution Report

You can use the Student Answer Distribution report to review student responses to assignments, which can then help you evaluate the structure and completeness of your courseware and problem components.

As an example, you define a text input question in Studio to have a single correct answer, "Warfarin". When you produce the Student Answer Distribution report, you verify that this answer was in fact marked correct: there is a 1 in the **Correct Answer** column for this **AnswerValue**.

However, as you view the report you notice other student answers that you did not set up to be marked as correct in Studio, but that you might (or might not) also consider to be correct, such as "Warfarin or Coumadin". The **Correct Answer** column shows that the other answers were marked incorrect (0), but for future iterations of your course you may want to revise the question or update the problem to evaluate additional variations of the answer as correct.

Many spreadsheet applications offer data visualization options, such as charts or graphs. Charts can help make your students' common misconceptions easier to identify.
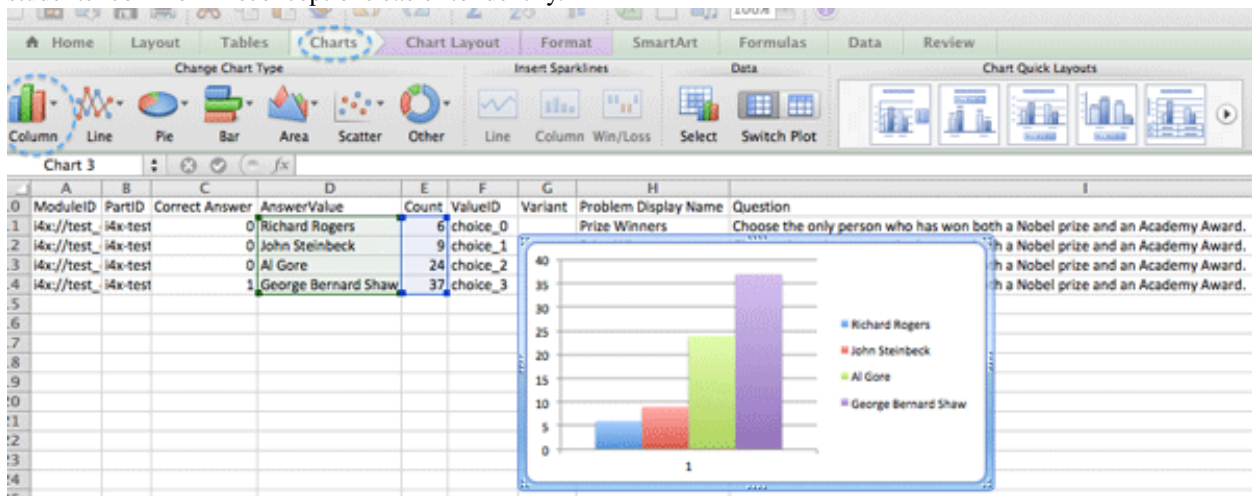
In this example, the Student Answer Distribution report is open in Microsoft Excel. To create a chart that shows how many of your students chose various answers to a multiple choice question, you move the **AnswerValue** and **Count** columns next to each other. After you click and drag to select the report cells that contain the data you want to chart, you select the Charts toolbar and then select the type of chart you want.

Note: Refer to the help for the spreadsheet application that you use for information on using these options. You may have to make changes to your spreadsheet, such as reordering columns. Save a copy of the file you originally downloaded as a backup before you begin.

You can adjust your course content based on common student mistakes. While most students in this example selected the correct answer, the number of incorrect answer(s) can guide future changes to the courseware.

11.12 Student Grades and Grading

You can review information about how grading is configured for your course, and access student grades, at any time after you create the course. You can also make adjustments to student grading for a problem, for a single student or all students. For information about the grading data that you can access and the changes you can make, see the following topics.

- *Review How Grading Is Configured for Your Course*

- *Generate a Grade Report for Enrolled Learners (All Courses)*

- *Generate a Problem Grade Report for Enrolled Students (All Courses)*

- *Review Grades for Enrolled Learners (Small Courses)*

- *Check the Progress of a Single Learner*

- *Adjust Grades*

To review student answers to the problems in your course, you can check the answer submitted by a specified student for a selected problem, download course-wide answer data, or review a graph of all answer data for a selected problem. See *Answer Data*.

For information about how you establish a grading policy and work with the Problem components in your course, see *Establishing a Grading Policy* or *Working with Problem Components*.

11.12.1 Review How Grading Is Configured for Your Course

You can review the assignment types that are graded and their respective weights on the Instructor Dashboard.

You establish a grading policy for your course when you create it in Studio. While the course is running, you can view an XML representation of the assignment types in your course and how they are weighted to determine learners' grades.

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download > Grading Configuration**.

   A list of the assignment types in your course displays. In this example, Homework is weighted as 0.3 (30%) of the grade.

```
=================================================================================
Course grader:
<class 'xmodule.graders.WeightedSubsectionsGrader'>

Graded sections:
  subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>,  type=Homework, category=Homework, weight=0.3
  subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>,  type=Midterm Exam, category=Midterm Exam, weight=0.3
  subgrader=<class 'xmodule.graders.AssignmentFormatGrader'>,  type=Final Exam, category=Final Exam, weight=0.4
=================================================================================
Listing grading context for course test_doc/SB101/2014_Jan
graded sections:
[u'Midterm Exam', u'Homework']
--> Section Midterm Exam:
      Second Verse (format=Midterm Exam, Assignment=Midterm 01)
--> Section Homework:
      Line 1 (format=Homework, Assignment=HW 01)
      Dusk (format=Homework, Assignment=HW 02)
      Parsing the distinctions (format=Homework, Assignment=HW 03)
      Verse 2 (format=Homework, Assignment=HW 04)
      Line 2 (format=Homework, Assignment=HW 05)
all descriptors:
length=37
```

   In Studio, you define this information by selecting **Settings > Grading**. For more information, see *Configure the Assignment Types*.

Important: Any changes that you make to the course grading policy, to graded subsections, or to graded components after the course begins will affect learners' experiences in the course as well as analysis of its data. EdX recommends that you announce any unavoidable changes learners by using, for example, the **Course Info** page. You should also carefully track these changes for researchers.

11.12.2 Generate a Grade Report for Enrolled Learners (All Courses)

For any course, you can generate grades and then download a file with the results for each enrolled learner.

When you initiate calculations to grade student work, a process starts on the edX servers. The complexity of your grading configuration and the number of students enrolled in your course affect how long this process takes. You can download a report of the calculated grades in a comma-separated values (.csv) file when the grading process is complete.

For courses with fewer than 200 students enrolled, you also have the option to review student grades on the Instructor Dashboard. See *Review Grades for Enrolled Learners (Small Courses)*.

To generate and download the grade report for the learners who are currently enrolled in your course, follow these steps.

Important: Because the grade report file contains confidential, personally identifiable data which might be subject to the Family Educational Rights and Privacy Act (FERPA), be sure to follow your institution's data stewardship policies when you open or save this file.

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. To start the grading process, click **Generate Grade Report**.

   A status message indicates that the grading process is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

4. To check the progress of the grading process, reload the page in your browser and scroll down to the **Pending Tasks** section. The status of active tasks is shown in the table.

   When the report is complete, a linked .csv file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_grade_report_{datetime}.csv`. The most recently generated reports appear at the top of the list.

5. To open or save a grade report file, locate and click the link for the grade report you requested.

   You can open .csv files in a spreadsheet application to sort, graph, and compare data.

Note: To prevent the accidental distribution of learner data, you can download grade report files only by clicking the links on this page. Do not copy these links for reuse elsewhere, as they expire within 5 minutes. The links on this page also expire if the page is open for more than 5 minutes. If necessary, refresh the page to generate new links.

Interpret the Grade Report

A grade report for your course is a time-stamped .csv file that identifies each enrolled learner by ID, email address, and username, and provides a snapshot of their cumulative course scores.

Scores in the grade report are presented by assignment. There is a column for every assignment that is included in your grading configuration: each homework, lab, midterm, final, and any other assignment type you added to your course.

Note: The grade report does not include information about individual problems within assignments, or include student answer distributions. For a report that shows problem-level information, see *Generate a Problem Grade Report for Enrolled Students (All Courses)*.

The report indicates the enrollment track for each learner. For professional and verified track learners it also shows whether they have verified their identity. The report shows whether each learner is eligible to receive a certificate (determined by whether he has earned a passing grade at the time the report was requested), whether a certificate has been generated, and the type of certificate earned.

If your course includes *cohorts* or *content experiments*, the grade report includes additional columns indicating the name of the cohort or experiment group that each learner belongs to.

id	email	username	grade	HW 01	HW 02	HW 03	HW 04	HW 05	HW 06	HW 07	HW Avg	Midterm	Final
			0.43	1	1	1	1	0	0	0	0.666666667	0.75	0
			0.05	0	1	0	0	0	0	0	0.166666667	0	0
			0.38	1	1	1	0.5	0	0	0	0.583333333	0.666666667	0
			0.3	1	1	0	0	0	0	0	0.333333333	0.666666667	0
			0.13	0	0	0	0.5	0	0	0	0.083333333	0.333333333	0

The grade report .csv file contains one row of data for each learner, and columns that provide the following information.

- Learner identifiers, including an internal **id**, **email** address, and **username**.

- The overall **grade**, with the total score a learner has currently attained in the course. This value is expressed as a decimal: a learner with a grade of 0.65 has earned 65% of the credit in the course, and a learner with a grade of 1 has earned 100%.

- Each **{assignment type} {number}** defined in your grading configuration, with the score that the learner attained for that specific assignment. For example, column HW 03 shows the scores for the third homework assignment.

- An **{assignment type} Avg** with each learner's current average score for that assignment type: for example, HW Avg.

- If *cohorts* are used in the course, a **Cohort Name** column indicates the name of the cohort that each learner belongs to, including the default cohort. The column is empty for learners who are not yet assigned to a cohort.

- If *content experiments* are used in the course, an **Experiment Group** column indicates the name of the experiment group that each learner belongs to within a group configuration. The column heading includes the name of the group configuration. The column is empty for learners who are not assigned to an experiment group. If you have more than one experiment group configuration in your course, you see one column for each group configuration.

- The **Enrollment Track** column indicates whether each learner is enrolled in the course in the honor code, verified, or professional education track.

- The **Verification Status** column applies only to learners who are enrolled in the verified or professional tracks. The value in this column indicates whether the verified or professional education learner has verified her identity to edX by using a webcam to submit her photo and an official ID.

- The **Certificate Eligible** column indicates whether a learner is eligible for a certificate for your course. The value in this column is "Y" for learners who attained a passing grade before this report was requested, and for

all whitelisted learners, regardless of grade attained. The value is "N" for learners who did not attain a passing grade and for those who live in embargoed countries.

- For learners who are eligible to receive a certificate, the **Certificate Delivered** column has a value of "Y" when the certificates for a course have been generated. The value is "N" for learners who are not eligible to receive a certificate.

- The **Certificate Type** column indicates the type of certificate that the learner is eligible for, such as "honor" or "verified". If a learner is not eligible for a certificate, or if the certificates for a course have not yet been generated, the value in this column is "N/A".

11.12.3 Generate a Problem Grade Report for Enrolled Students (All Courses)

For any course, you can calculate grades for problems and generate a report that can be downloaded. The problem grade report for a course shows the number points that each learner has earned for each problem and the number of possible points for every problem in the course and the . In addition, the report shows the final grade score for each learner.

To generate and download the problem grade report for the learners who are currently enrolled in your course, follow these steps.

Important: Because the problem grade report file contains confidential, personally identifiable data which might be subject to the Family Educational Rights and Privacy Act (FERPA), be sure to follow your institution's data stewardship policies when you open or save this file.

---

1. View the live version of your course.

2. Click **Instructor**, then click **Data Download**.

3. To start the problem grading process, click **Generate Problem Grade Report**.

   A status message indicates that the problem grading process is in progress. This process can take some time to complete, but you can navigate away from this page and do other work while it runs.

4. To check the progress of the problem grading process, reload the page in your browser and scroll down to the **Pending Tasks** section. The status of active tasks is shown in the table.

   When the report is complete, a linked .csv file name becomes available above the **Pending Tasks** section. File names are in the format `{course_id}_problem_grade_report_{datetime}.csv`. The most recently generated reports appear at the top of the list.

5. To open or save a problem grade report file, locate and click the link for the problem grade report you requested.

   You can open .csv files in a spreadsheet application to sort, graph, and compare data.

Note: To prevent the accidental distribution of learner data, you can download problem grade report files only by clicking the links on this page. Do not copy these links for reuse elsewhere, as they expire within 5 minutes. The links on this page also expire if the page is open for more than 5 minutes. If necessary, refresh the page to generate new links.

Interpret the Problem Grade Report

A problem grade report for your course is a time-stamped .csv file that identifies each enrolled learner by ID, email address, and username, and provides a snapshot of earned scores compared with the possible scores for each problem.

The problem grade report includes two columns for every problem that is included in your grading configuration. For each homework, lab, midterm, or final exam problem, there is one column for earned points, and one column for possible points. In addition, the report shows the final grade score for each learner, espressed as a decimal.

Student ID	Email	Username	Final Grade	Quiz 1: Quiz 1 - X-ray Technology (Earned)	Quiz 1: Quiz 1 - X-ray Technology (Possible)	Quiz 2: Quiz 2 - CT Technology (Earned)	Quiz 2: Quiz 2 - CT Technology (Possible)	Exam 1: Midterm - Clinical Applic
			0.6	1	1	0	1	
			0.57	1	1	1	1	
			0.48	0	1	1	1	
			0.6	1	1	1	1	

The .csv file contains one row of data for each learner, and columns that provide the following information.

- Learner identifiers, including an internal **Student ID**, **Email** address, and **Username**.

- The **Final Grade**, with the total score that a learner has currently attained in the course. This value is expressed as a decimal: a learner with a grade of 0.65 has earned 65% of the credit in the course, and a learner with a grade of 1 has earned 100%.

- For each problem (identified by assignment, subsection, and problem name), a column showing the number of points actually earned by each learner. If a learner has not viewed a problem, the value in this column is "N/A". If a learner has not answered a problem, the value in this column is "0".

- For each problem (identified by assignment, subsection, and problem name), a column showing the number of points that it is possible to earn for the problem. If a learner has not viewed a problem, the value in this column is "N/A".

11.12.4 Review Grades for Enrolled Learners (Small Courses)

For courses with enrollments of up to 200 learners, you can review a gradebook on the Instructor Dashboard.

1. View the live version of your course.

2. Click **Instructor**, then click **Student Admin**. For courses with fewer than 200 students enrolled, this tab includes a **Student Gradebook** section.

3. Click **View Gradebook**. Grades are calculated and the gradebook displays.

The gradebook includes the following features.

- You can click the username in each row to review that learner's **Course Progress** page. See *Check the Progress of a Single Learner*.

- There is a column for each **{assignment type} {number}** defined in your grading configuration, with the scores that the learner attained for that specific assignment.

The gradebook does not have a scroll bar, but it can be dragged: to see columns that are hidden at one side of the grade book, click the gradebook and then drag left or right to reveal those columns.

- For assignment types that include more than one assignment, an **{assignment type} Avg** column displays each learner's current average score for that assignment type.

- The **Total** column presents the total score that each learner has currently attained in the course. This value is expressed as a whole number: a learner with a grade of 65 has earned 65% of the credit in the course, and a learner with a grade of 100 has earned 100%.

- To filter the data that displays you can use the **Search students** option. This option is case-sensitive and limits the rows shown in the gradebook to usernames that match your entry.

11.12.5 Check the Progress of a Single Learner

To check a single learner's progress, you can locate the specific row on the grade report or review the learner's **Progress** page. The **Progress** page includes a chart that plots the score the learner has earned for every graded assignment and the total grade as of the current date. Below the chart, each assignment and the score attained are listed.

To review a learner's **Progress** page, you supply an email address or username. You can check the progress for learners who are either enrolled in, or who have unenrolled from, the course.

Learners can view a similar chart and assignment list (of their own progress only) when they are logged in to the course. See *A Learner's View of Course Progress*.

To view the **Progress** page for a learner, follow these steps.

1. View the live version of your course.

2. Click **Instructor**, then click **Student Admin**.

3. In the Student-Specific Grade Inspection section, enter the student's email address or username.

4. Click **Student Progress Page**.

   The **Progress** page for the learner displays a chart with the grade for each homework, lab, midterm, final, and any other assignment types in your course, and the total grade earned for the course to date. The chart does not reflect any cohort or experiment group assignments.
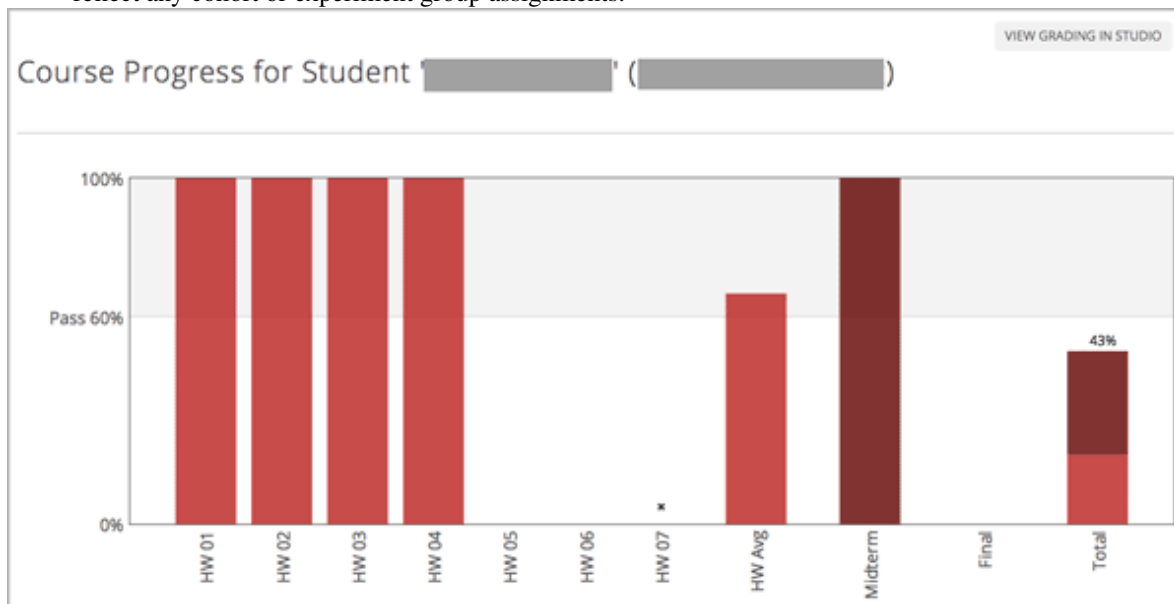
To learn more about a particular assignment, move the cursor onto the value in the chart. A brief description displays.
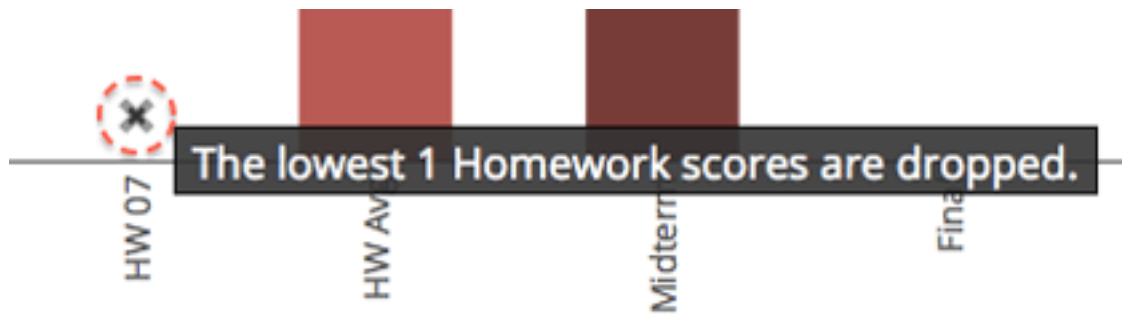
Below the chart, subsections are listed on the left and the units that contain assignments are listed on the right. The learner's individual problem scores display.

Interpret the Student Progress Page

The chart of a learner's scores on the **Progress** page and the rows of data on the grade report present assignment scores in a similar order. However, the total, cumulative score earned for the course is placed in a different position on the **Progress** page.

In this example grade report, the indicated learner has a current grade of 0.43 (43%).

id	email	username	grade	HW 01	HW 02	HW 03	HW 04	HW 05	HW 06	HW 07	HW Avg	Midterm	Final
			0.43	1	1	1	1	0	0	0	0.666666667	0.75	0
			0.05	0	1	0	0	0	0	0	0.166666667	0	0
			0.38	1	1	1	0.5	0	0	0	0.583333333	0.666666667	0
			0.3	1	1	0	0	0	0	0	0.333333333	0.666666667	0
			0.13	0	0	0	0.5	0	0	0	0.083333333	0.333333333	0

- On each of the first four homework assignments the learner scored 1 (100%), but currently has a 0 (0%) on each of the remaining three assignments.

  Notice, however, that the learner's current average score for homework assignments is listed as 0.666666667 (67%): in this course, the homework assignment with the lowest score is dropped, so this average is over six assignments rather than all seven.

- The learner has a score of 0.75 (75%) on the midterm, and a score of 0 (0%) on the final.

On the learner's **Progress** page, you see the same information graphically represented; however, the student's "total" of 43% is on the far right.
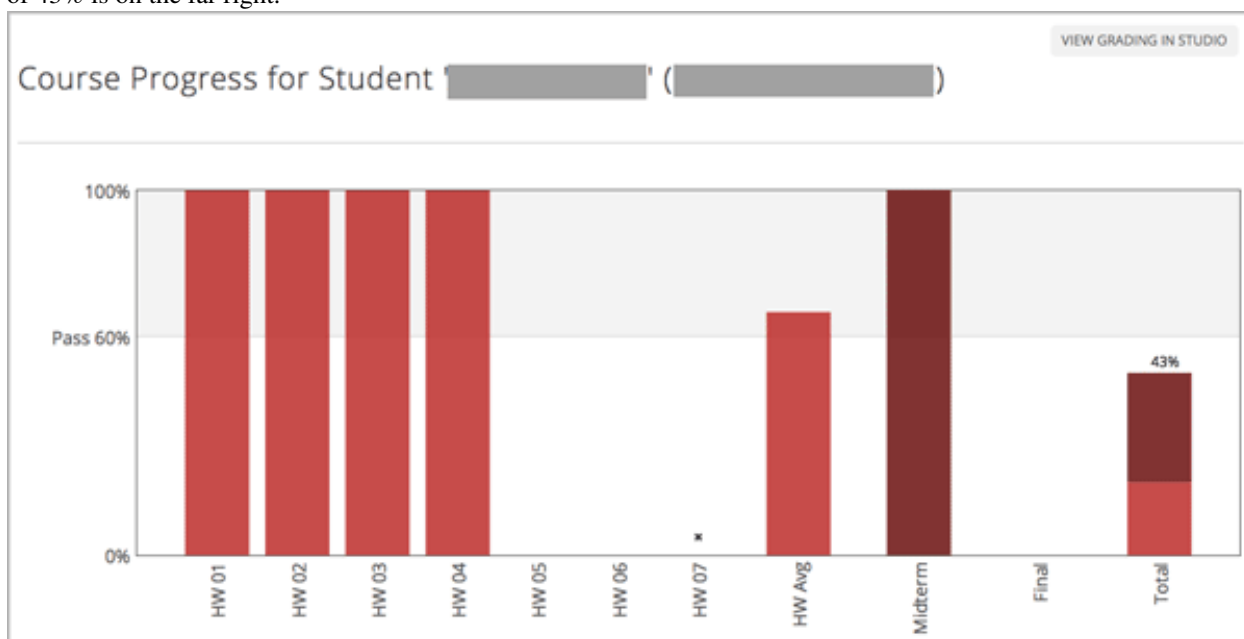
The chart on the **Progress** page includes y-axis labels for the grade ranges defined for the course. In this example, Pass is set to 60%, so at the end of the course, learners with a grade of 0.60 or higher can receive certificates.

Note: Learner scores on the **Progress** page are a snapshot of the current state of the problem score database. They can, at times, be out of sync with actual problem scores. For example, asynchronicities can occur if the weight of a live problem was changed during an assignment, and not all learners have resubmitted their answers for that problem.

A Learner's View of Course Progress

Learners can check their progress by clicking **Progress** in the course navigation bar. The learner's progress through the graded part of the course displays at the top of this page, above the subsection scores. Progress is visualized as a chart with entries for all the assignments, total percentage earned in the course so far, and percent needed for each grade cutoff. Here is an example of a learner's progress through edX101.
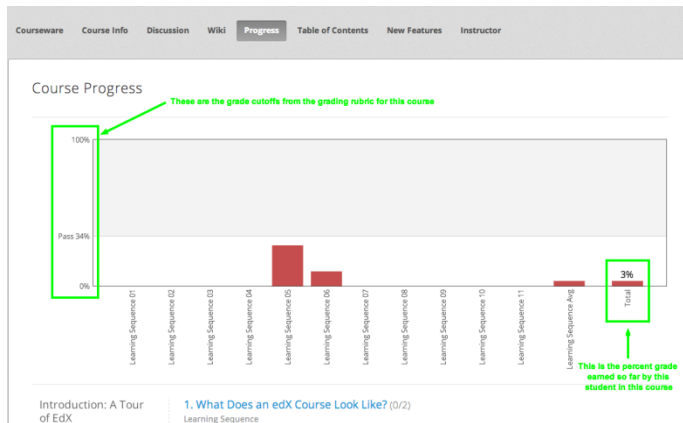
The learner can see from this page that edX101 was graded as a Pass/Fail course with a cutoff of 34% and that the grading rubric contained one assignment type, called Learning Sequence, consisting of 11 assignments total. Furthermore, this particular learner has only submitted correct responses to two assignments, and her current total percent grade in the course is 6%. By hovering over each progress bar, learners can get further statistics of how much each assignment was counted as.

Further down on the **Progress** page is a list of all the subsections in the course, with the scores recorded for the learner for all problems in the course. Here is the **Progress** page for the learner in the example above:
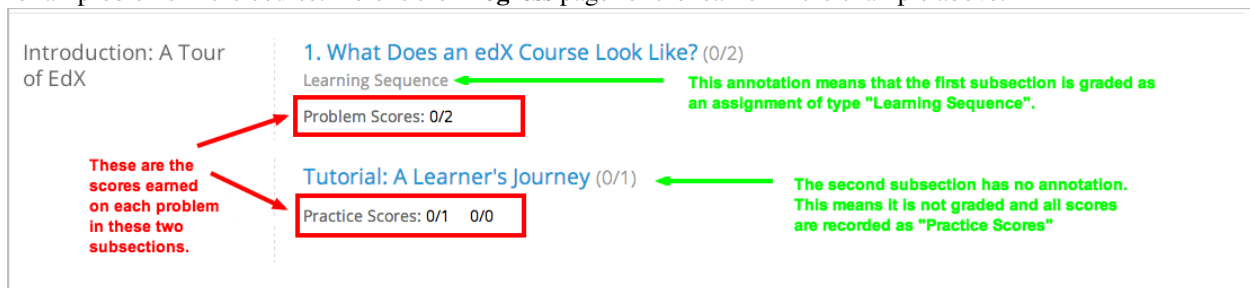
Note that point scores from graded sections are called "Problem Scores", while point scores from ungraded sections are called "Practice Scores".

11.12.6 Adjust Grades

If you modify a problem or its settings after learners have attempted to answer it, learners' grades can be affected. For information about making changes to problems in Studio, see *Modifying a Released Problem*.

To recalculate the grades of affected learners when a correction or other change is unavoidable, you can make the following adjustments.

- Rescore the submitted answer to reevaluate student work on a problem. You can rescore a problem for a single learner or for all of the students enrolled in the course. See *Rescore Student Submissions for a Problem*.

- Reset the number of times a learner has attempted to answer a problem to zero so that he can try again. You can reset the number of attempts for a single learner or for all learners enrolled in the course. See *Reset Student Attempts for a Problem*.

- Delete a learners's database history, or "state", completely for a problem. You can only delete learner state for one learner at a time. For example, you realize that a problem needs to be rewritten after only a few of your students have answered it. To resolve this situation, you rewrite the problem and then delete learner state only for the affected students so that they can try again. See *Delete Student State for a Problem*.

To make adjustments to learner grades, you need the unique location identifier of the modified problem. See *Find the Unique Location Identifier for a Problem*.

Find the Unique Location Identifier for a Problem

When you create each of the problems for a course, edX assigns a unique location to it. To make grading adjustments for a problem, or to view data about it, you need to specify the problem location.

To find the unique location identifier for a problem:

1. View the live version of your course.

2. Click **Courseware** and navigate to the unit that contains the problem.

3. Display the problem and then click **Staff Debug Info**.

   Information about the problem displays, including its **location**.
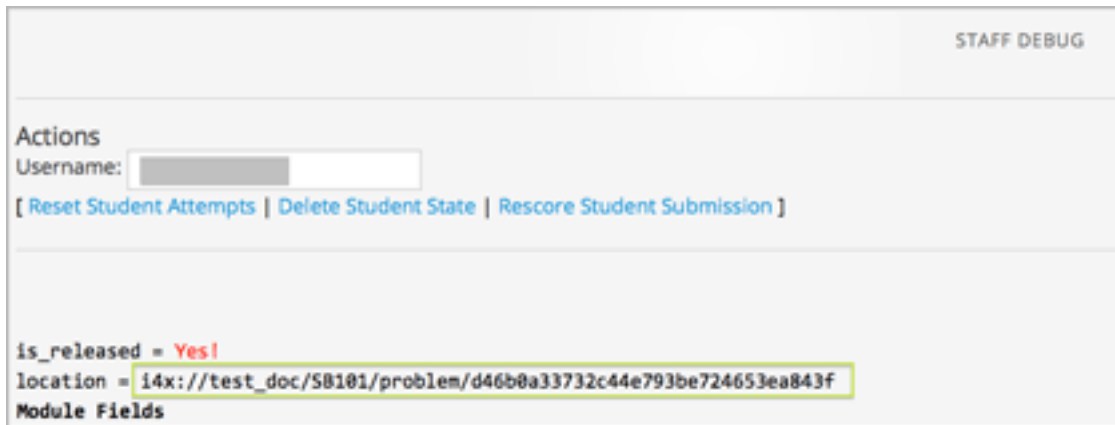
4. To copy the location of the problem, select the entire location, right click, and choose **Copy**.

To close the Staff Debug viewer, click on the browser page outside of the viewer.

Rescore Student Submissions for a Problem

Each problem that you define for your course includes a correct answer, and may also include a tolerance or acceptable alternatives. If you decide to make a change to these values, you can rescore any responses that were already submitted. For a specified problem, you can rescore the work submitted by a single student, or rescore the submissions made by every enrolled student.

Note: You can only rescore problems that have a correct answer entered in edX Studio. This procedure cannot be used to rescore problems that are scored by an external grader.

Rescore a Submission for an Individual Student

To rescore a problem for a single student, you need that student's username or email address.

1. View the live version of your course.

2. Click **Courseware** and navigate to the component that contains the problem you want to rescore.

3. Display the problem, then click **Staff Debug Info**. The Staff Debug viewer opens.

4. In the **Username** field, enter the student's email address or username, then click **Rescore Student Submission**. A message indicates a successful adjustment.

5. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Rescore Submissions for All Students

To specify the problem you want to rescore, you need its location identifier. See *Find the Unique Location Identifier for a Problem*. To rescore a problem:

1. View the live version of your course.

2. Click **Instructor**, then click **Student Admin**.

3. In the **Course-Specific Grade Adjustment** section of the page, enter the unique problem location, and then click **Rescore ALL students' problem submissions**.

4. When you see a dialog box that notifies you that the rescore process is in progress, click **OK**.

   This process can take some time to complete for all enrolled students. The process runs in the background, so you can navigate away from this page and do other work while it runs.

6. To view the results of the rescore process, click either **Show Background Task History for Student** or **Show Background Task History for Problem**.

   A table displays the status of the rescore process for each student or problem.

Note: You can use a similar procedure to rescore the submission for a problem by a single student. You work in the **Student-Specific Grade Adjustment** section of the page to enter both the student's email address or username and the unique problem identifier, and then click **Rescore Student Submission**.

Reset Student Attempts for a Problem

When you create a problem, you can limit the number of times that a student can try to answer that problem correctly. If unexpected issues occur for a problem, you can reset the value for one particular student's attempts back to zero so that the student can begin work over again. If the unexpected behavior affects all of the students in your course, you can reset the number of attempts for all students to zero.

Reset Attempts for an Individual Student

To reset the number of attempts for a single student, you need that student's username or email address.

1. View the live version of your course.

2. Click **Courseware** and navigate to the component that contains the problem you want to reset.

3. Display the problem, then click **Staff Debug Info**. The Staff Debug viewer opens.

4. In the **Username** field, enter the student's email address or username, then click **Reset Student Attempts**. A message indicates a successful adjustment.

5. To close the Staff Debug viewer, click on the browser page outside of the viewer.

Reset Attempts for All Students

To reset the number of attempts that all enrolled students have for a problem, you need the unique identifier of the problem. See *Find the Unique Location Identifier for a Problem*. To reset attempts for all students:

1. View the live version of your course.

2. Click **Instructor**, then click **Student Admin**.

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3. To reset the number of attempts for all enrolled students, you work in the **Course-Specific Grade Adjustment** section of the page. Enter the unique problem location, then click **Reset ALL students' attempts**.

4. A dialog opens to indicate that the reset process is in progress. Click **OK**.

   This process can take some time to complete. The process runs in the background, so you can navigate away from this page and do other work while it runs.

5. To view the results of the reset process, click either **Show Background Task History for Student** or **Show Background Task History for Problem**.

   A table displays the status of the reset process for each student or problem.

Note: You can use a similar procedure to reset problem attempts for a single student. You work in the **Student-Specific Grade Adjustment** section of the page to enter both the student's email address or username and the unique problem identifier, and then click **Reset Student Attempts**.

Delete Student State for a Problem

To delete a student's entire history for a problem from the database, you need that student's username or email address.

Important: Student state is deleted permanently by this process. This action cannot be undone.

You can use either the Staff Debug viewer or the Instructor Dashboard to delete student state.

To use the Staff Debug viewer:

1. View the live version of your course.

2. Click **Courseware** and navigate to the component that contains the problem.

3. Display the problem, then click **Staff Debug Info**. The Staff Debug viewer opens.

4. In the **Username** field, enter the student's email address or username, then click **Delete Student State**. A message indicates a successful adjustment.

5. To close the Staff Debug viewer, click on the browser page outside of the viewer.

To use the Instructor Dashboard, you need the unique identifier of the problem. See *Find the Unique Location Identifier for a Problem*.

1. Click **Instructor**, then click **Student Admin**.

2. In the **Student-Specific Grade Adjustment** section of the page, enter both the student's email address or username and the unique problem identifier, and then click **Delete Student State for Problem**.

11.13 Assign Final Grades and Issue Certificates

As you prepare for the end of your course, you can send students a *course farewell* email message.

To assign a final grade to each student enrolled in a course, you generate grades after the **Course End Date** and **Time** have passed. See *Generate a Grade Report for Enrolled Learners (All Courses)*.

The final grades of a student in the course and the grading configuration you set in Studio are used to determine whether the student has earned a Certificate of Mastery for the course.

The process of issuing certificates is completed at edX: work with your edX program manager to schedule a date to issue certificates and complete this process.

11.13.1 On-Demand Certificates

If you have a self-paced course, you can allow your students to download their certificates as soon as they have completed enough of the course with a high enough grade to qualify for a certificate. For these courses, you work with edX to create a certificate template and enable on-demand certificates. Students can then request and download their certificates.

Note: If your course offers on-demand certificates, we encourage you to include this information on your course About page, on the **Course Info** page in the LMS, and in communication with your learners.

Learners can request a certificate at any time after they qualify. Learners may want to request a certificate right away, or they may wait until they have completed the course. For more information, see On-Demand Certificates.