



Teach with GIS

Implementation Roadmap
for your Classroom



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Welcome!

Thank you for choosing ArcGIS Online in your classroom to incorporate mapping into your curriculum.

You are joining a thriving community of millions of people who use the power of location to make better decisions. You are engaging in a process that will transform the way you teach by enabling your students to discover, use, make, and share location information, on any device, from anywhere, at any time.

To help you get started, we have provided a simple guide for launching and teaching with ArcGIS®. This guide shows you how to prepare and begin using ArcGIS as soon as possible. If at any point you need support from Esri, we are here to help you along the way.

Congratulations on taking this transformative step. We are very excited about what you will accomplish as location information becomes a fundamental component of your STEM curriculum.

Maps and data underpin GIS, a technology that organizes information into all types of layers that can be visualized, analyzed, and combined to help us understand almost everything about our world. Web GIS connects and organizes many individual GIS systems into a collective GIS for the planet—available for use by anyone with an Internet connection. It's time to join and participate.



Student Testimonials

"It's very practical. It's very real-world thinking."

Aren
Fairfax High School,
2018 Geospatial Semester

"I realized that GIS was something I wanted to continue diving into, whether or not it ended up as a career. I declared Geographic Science as a major when I started at James Madison University, and I never changed because there were so many different facets. You could find the parts of geography that were really interesting to you. Being able to use GIS for any one of those parts made it so much more fascinating, and so much more accessible."

Becky
Heritage High School,
Graduate of the 2013 Class at Heritage High School

Watch this video for more testimonials from [current](#) and [former](#) students enrolled in the Geospatial Semester in Loudoun and Fairfax Counties, Virginia.

Why do you need this guide?

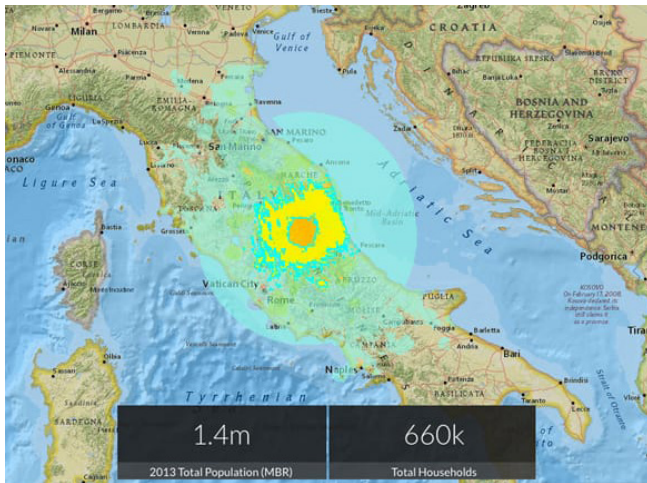


This is your learn-by-doing guide into ArcGIS and provides the steps to help you prepare for introducing map-making and spatial analyses into your classroom. It will provide you with a strategy for successfully introducing mapping technology into your curriculum.

It's a Web GIS world

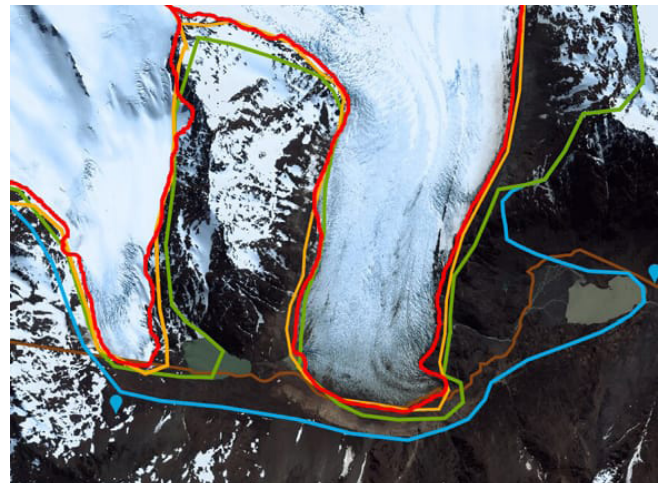
Mapping and analytics connect everyone

GIS has the extraordinary potential to touch every web-connected being through a common visual language that unites people across organizations and throughout the world. Today, hundreds of thousands of organizations in virtually every field of human endeavor are using GIS to make maps that communicate, perform analysis, share information, and solve complex problems. This is literally changing the way the world works. The power of this shift in the ways that people think about maps and geographic data is evident in these compelling examples.



GIS maps are uniquely of the moment

Published moments after the event, this shakemap portrayed the extent of area and people affected by the devastating 2016 earthquake in central Italy.



GIS maps reveal rapid global change

If a picture tells a thousand words, a map tells a thousand pictures. This map starkly reveals the disheartening extent of glacier retreat in the Southern Hemisphere.

For more great examples of web maps and applications visit [The ArcGIS Book](#).

Do you have to follow the guide completely to be successful?

Your implementation of a mapping curriculum will vary based on your goals for your class. This guide outlines some of the best practices for implementing ArcGIS. However, you may have your own methods that work for you or that you are required to follow. Use the guidelines outlined here when and where applicable. Feel free to supplement the guide with your own steps as needed.



ROAD MAP

In the following pages you will find:

- 1 Getting Started: A GIS 'On-ramp' for Teachers 9
- 2 GIS Skill Builders: Use a Map, Make a Map, Share a Map 12
- 3 Tips and Tricks for a GIS-enabled Classroom. 26
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Getting Started: A GIS On-Ramp for Teachers



This implementation roadmap is the on-ramp to user-friendly activities and resources to help you develop your own geospatial toolkit and use it with confidence. It is a guide for building your own GIS skills and beginning the process of integrating geospatial technologies across your teaching practice.

The roadmap includes:

- **GIS Skill Builders:** These activities provide guided practice in skills that you'll utilize again and again as you employ GIS to explore global and community issues. The activities are quick, easy, and fun. You can take as much or as little time as you wish. Use these activities as a personal tutorial to build your own skillset, or use them as instructional activities for your students — they work both ways.

Skill-Builder 1: Explore a web map

Skill-Builder 2: Make a web map

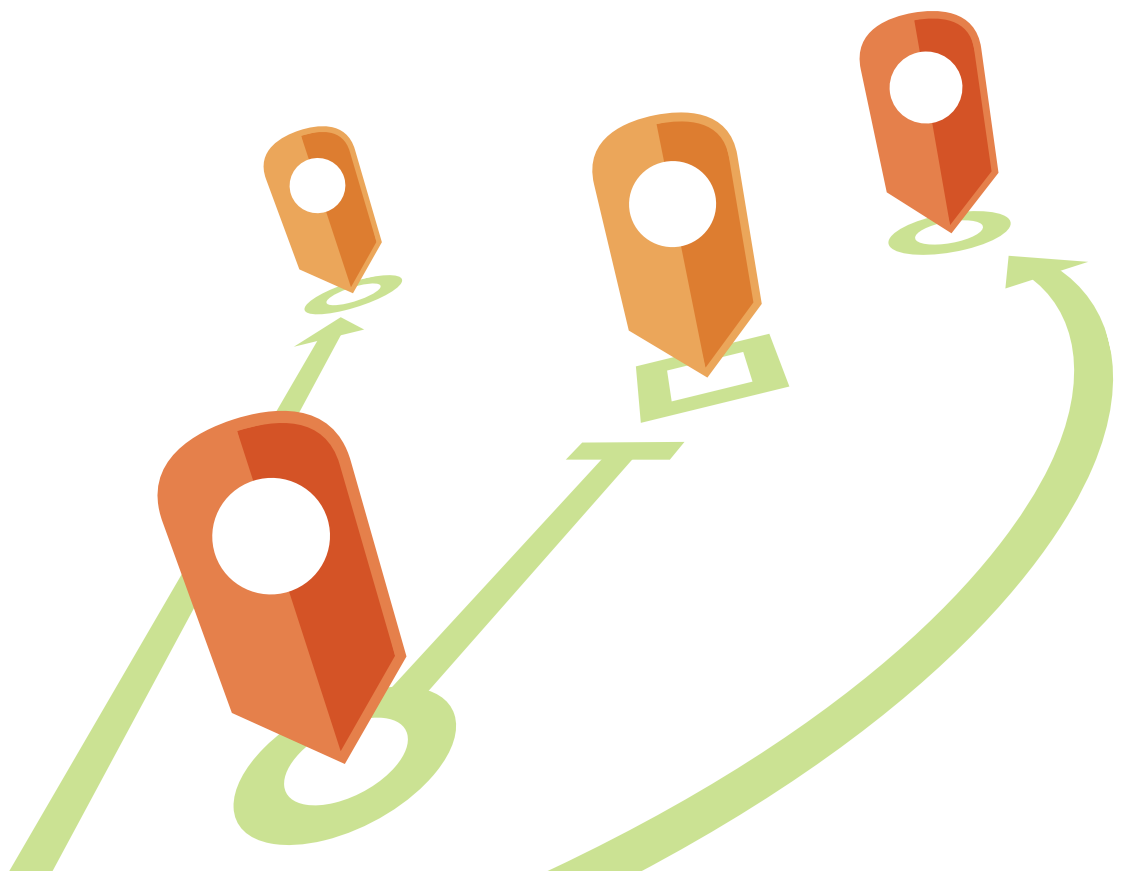
Skill-Builder 3: Share a web map

If you are already a skilled ArcGIS Online user, use the Skill-Builders for a quick review or start searching for more hands-on exercises in the [Curriculum Builder](#).

- **Tips and suggestions for creating a GIS-enabled classroom:** This section provides valuable strategies for integrating geospatial problem-solving tools and maximizing their impact in your classroom. Topics include:
 - Web mapping for assessment
 - Seizing the teachable moment
 - Many ways to use Story Maps



- **[GIS Curriculum Builder](#)**: This unique tool is a collection of classroom-ready lessons that you can use to build your own GIS-enabled curriculum. The catalog has been structured as a filtered database, enabling you to select from over ninety stand-alone lessons to identify the ones that fit your needs. The lessons are categorized by topic, level of difficulty, GIS functions, and organization access level.
- **Set Up Your ArcGIS Online Organization**: An ArcGIS organization provides the magic that will transform your classroom into a center of geospatial inquiry. This section includes:
 - Simple directions to guide you to obtain membership in an ArcGIS Online organization. If you already have an ArcGIS Online membership and know your login information (user name and password), you may begin with the On-Ramp's Skill Builders.
 - If you have an organizational account and are ready to have your class begin mapping right away, follow these [simple directions](#) for getting your students into an organization.



GIS Skill Builders



GIS Skill-Builders

Maps are the primary way that GIS users share their work with others in their organizations and beyond. Maps provide a critical context because they are both analytical and artistic. They carry a universal appeal and offer a clarity and shape to the world. Maps enable you to explore your data and to discover and interpret patterns.

The role of GIS maps

Web maps are online maps created with ArcGIS that provide a way to work and interact with geographic content organized as layers. They are shared across your organization and beyond on the web and across smartphones and tablets. At their heart, GIS maps

are simple. Start with a basemap and mash it up with your own data layers or those from other ArcGIS users. Then add tools that support what you want your users to do with your map: tell stories, perform analytical studies, collect data in the field, or monitor and manage operations.

Maps are how you deploy your GIS

Virtually anything you do with GIS can be shared using maps. And they can go anywhere. GIS maps work online and on any smartphone, and along with your supporting GIS work, they are accessible anytime. Online web maps have forever transformed computing and the web.

Skill-BUILDER 1: Explore a Web Map

Web GIS revolves around the map. It's the framework for your data and the primary geographic container that gets shared and embedded in your apps. In ArcGIS it is called a web map.

In this Skill Builder you will learn how to:

- Open an existing web map
 - Change basemaps
 - Style map layers

Each map contains a reference basemap along with a set of additional data layers, plus tools that work on these layers. The tools can do simple things, such as open a pop-up window when you click on the map, or more complex things, such as performing spatial analysis. This exercise will help you get acquainted with the basics of the ArcGIS Online interface.

1. Open an existing web map

The first part of this Skill-builder is to open an existing web map to see how it's constructed.

- Click the link to open a map called [Web Mapping in ArcGIS Online](#).

In order to see what's included in the map, look at its list of contents.

- Next to the map, click on the Show Contents of Map button



There are 4 layers in the list of contents: State Capitals, U.S. Major Rivers, U.S. State Boundaries, and Topographic. The first three are data layers and Topographic is the basemap.

2. Turn layers on and off

The capitals, rivers, and boundaries layers have a check box in front of the layer name.

- Click in the checkbox to see what happens. Checking a layer box turns it on and makes it visible.
- Click the checkbox again to turn the layer off.

3. Change the Basemap

Basemaps provide locational context (the "stage") for the content that is to be overlaid on them. When constructing your map, there are many basemaps to choose from.

- Click the Basemap tab on the map's menu ribbon.
- Select a new basemap to see the differences from the topographic basemap. Turn the layers on above the new basemap.
- Experiment with other basemaps to see how they change your impressions.
- Select the Imagery basemap, and turn on the **U.S. States Boundaries layer**.

4. Change the appearance of the State Boundaries layer

The state boundaries on your new map are a little hard to see. They might be easier to discern in a different color.

- Click Modify Map in the upper right corner above the map.
- Click the U.S. States Boundaries layer name to display an array of icons. Click on the Change Style icon.

The style of your data includes its symbols, transparency, and visibility range. The Change Style pane provides style choices based on the nature of your data. It uses the type of data you are using (for example, points or lines), the attributes used to describe your data, and your basemap to provide options that can help you better represent your data. In the current example, we'll just change the color to make the boundaries easier to see.

- For Select a Drawing Style, click OPTIONS.
- Click Symbols.
- What you want to change is the layer's outline, so click Outline.
- Choose a color that is lighter than the current gray boundary line. Notice that you can also change the line width and the line's transparency.
- Experiment with different possibilities.
- Click OK when you've decided on the color you want to use.
- Once you've made a final selection, click OK again, and then DONE to make the style change in your map.

So far, you've been working with ArcGIS Online without the need to sign in. Additional lessons to increase your skill without signing in to an ArcGIS account can be found by using the [Curriculum Builder](#). Search for Software Access: Account not required.

Anyone can make, share, and use web maps

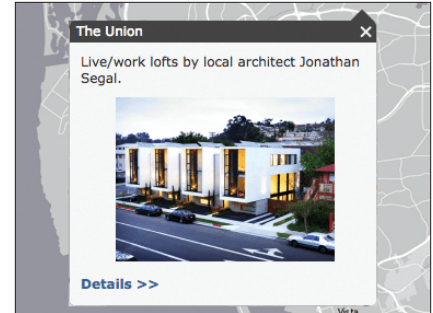
This map creation a pattern is something you can follow every time you start a new project:



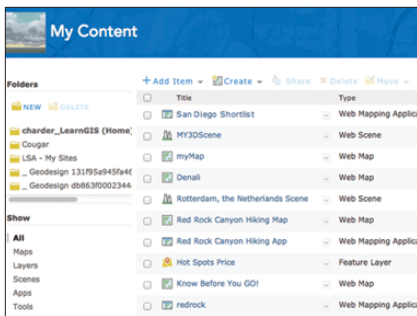
Select a basemap and zoom into your area of interest.



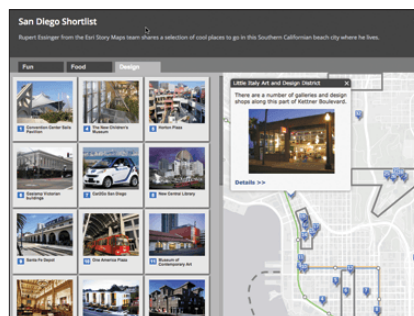
Add your data layers and specify how each will be symbolized and portrayed.



Create pop-ups that enable users to explore features by clicking on them.



Save your map into your My Content folder with a good description and a thoughtful name.



Share your map as a story map or other configurable web app.

Skill-Builder 2: Make a Web Map

Web maps are online maps created with ArcGIS that provide a way to work and interact with geographic content organized as layers. Your web maps can be shared across your organization and beyond on the web and across smartphones and tablets.

In this Skill Builder, you will learn how to:

- Sign in to ArcGIS Online
- Create a new web map
 - Add content to a map
 - Format map pop-ups
- Save and share a web map

Scenario: Your school's environmental club will host the final rounds of the National Environmental Olympics. Prior to the championship round, schools will be grouped by geographic region. You have been asked to make a map showing the location of schools in the northern region of the United States and share it with other members of the club's ArcGIS Online organization.

Open a new map and add content

There are numerous ways to add content to a map in ArcGIS Online. In this example, you'll add data to the map from a spreadsheet. You'll download the spreadsheet to your own computer first.

1. Sign in to ArcGIS Online

The first step to create a web map is signing in to your ArcGIS Online organization.

- In a web browser, type www.arcgis.com.
- Click Sign In.
- Type your user name and password and click Sign In.

Note: If necessary, review the directions on p. 4 for acquiring an ArcGIS Online organization.

2. Download the data

- In the search box (upper right corner), type Schools_North_Learn and Item Type Layers >> Layer Files. If necessary, turn off the option to Only Search in <your organization>.
- Open Schools_North_Learn.csv.
- Download the CSV file to your own computer.

This file contains data about the schools in the northern region that you will map.

Note: This spreadsheet of schools in the northern region was created in Excel, saved as a CSV (Comma Separated Values) file, and uploaded to ArcGIS Online. You can create your own data in the same way to add it to ArcGIS Online. Just be sure your file has location fields such as the address fields in this spreadsheet, place- names, ZIP Codes, or latitude/longitude coordinates. These are the fields that ArcGIS Online uses to map the data. You can learn more about creating map layers from csv files [here](#).

3. Open a new map

- Click Map at the top of the page to open a new map.

4. Add content to the map

- In the new map, click Add and choose Add Layer from File.
- On the Add Layer from File dialog box, browse to the Schools_North_Learn.csv file that you just downloaded to add it to your map.

- Click Import Layer.
- Click Add Layer.

5. Style the new layer

The Change Style pane opens when the layer is added. This is the same Change Style pane that you used to change the appearance of the State Boundaries in step 4.

- In the Change Style pane, choose Show location only.
- To select a drawing style, select OPTIONS.

The default setting displays the data points as black dots. Let's change that.

- Click the word Symbols.

ArcGIS Online offers many options for symbolizing the location of your points. Take a few minutes to explore the drop-down menu of symbol sets and select one that appeals to you. A good choice might be a simple dot from the Shapes or Basic group.

Note: Some styles have additional options, such as symbol size, color, line width, and transparency. If you are interested in learning more about style options, go to this [ArcGIS Online Help page](#) that provides steps for using style options.

- When you've selected a symbol, click OK twice, and click DONE.

6. Edit the map pop-up

Web maps are windows into a wealth of information. Click on a map location to pop up a report and explore the information behind it. Pop-ups help reach into the map for more detailed information that emerges on demand. A single window into a map can become a window into a world of related information, including charts, images, multimedia files, and analytics.

Clicking the symbols on this map opens the pop-up window displaying data about this school. The default pop-up often contains information that is not relevant to the audience. In this example, you should remove Id from the pop-up list since it means nothing to most users.

- Click the More Options icon (three dots) under the Schools_North_Learn layer name.
- Select Configure Pop-up.
- Click Configure Attributes.
- Uncheck Id under Display.
- Click OK and OK.

To see your edit, click on a symbol again to see that the Id field is no longer part of the pop-up.

7. Save the map

- At the top of the map, click Save > Save As.
- In the Save Map dialog box, enter a title, tags, and summary as follows and then click Save Map.
 - Title: 2018 Environmental Olympics: Northern Region Schools_(your initials)
 - Tags: environmental competition, northern region
 - Summary: Location of schools from the northern region participating in the 2018 Environmental Olympics

With just a few clicks, you have learned to

- Open an existing web map
- Select and change basemaps
- Style the appearance of data layers
- Sign in to ArcGIS Online
- Create a new web map
- Add data to a map from a spreadsheet
- Edit a layer pop-up
- Save a map

Skill-Builder 3: Share your map

With billions of smartphones, tablets, laptop computers, and other Internet-connected devices in use worldwide, stand-alone apps have captured the world's attention. GIS apps in particular have transformed how people think about geography. Every map is an app—a user experience that brings that map into use.

Once you modify and save your own web map, you can share it with anyone, from any location, and on any device. This is also true for web applications (apps), such as Story Maps, that you create from your web maps.

In this Skill Builder you will learn how to:

- Share maps and apps
- Configure a web application
- Edit content

Scenario: You have been asked to share your map of northern region schools with everyone in your environmental club's ArcGIS Online organization. Once shared, all members will have access to it. Members will then be able to use your map in the development of products like name tags, score sheets, and posters.



ArcGIS Online provides many configurable web applications that allow you to create a customized experience for your specific audience and purpose without any programming knowledge.

In this activity, you will share a web map with others and use it in a web application.

1. Sign in to ArcGIS Online

- In a web browser, type www.arcgis.com.
- Click Sign In.
- Type your user name and password and click Sign In.

Note: If necessary, review the directions on p. 4 for acquiring an ArcGIS Online organization.

2. Open the map you created in Skill-BUILDER 1

- In ArcGIS Online, click My Content.
- Find the map you want to share, in this case the map you created in Skill-builder 1.
- Click the map name to go to its Item Details page.
- Click Share.

Note: Settings for sharing your map can be made in the My Content list,

the Item Details page or the map viewer window.

There are several sharing options available, each related to the level of access you want to assign to your content. There are four levels, each with increasing accessibility to the content: private, group, organization, and public.

Private: Accessible only to the content owner and administrator(s) of the organization. This is the default setting or can be set by unchecking all boxes.

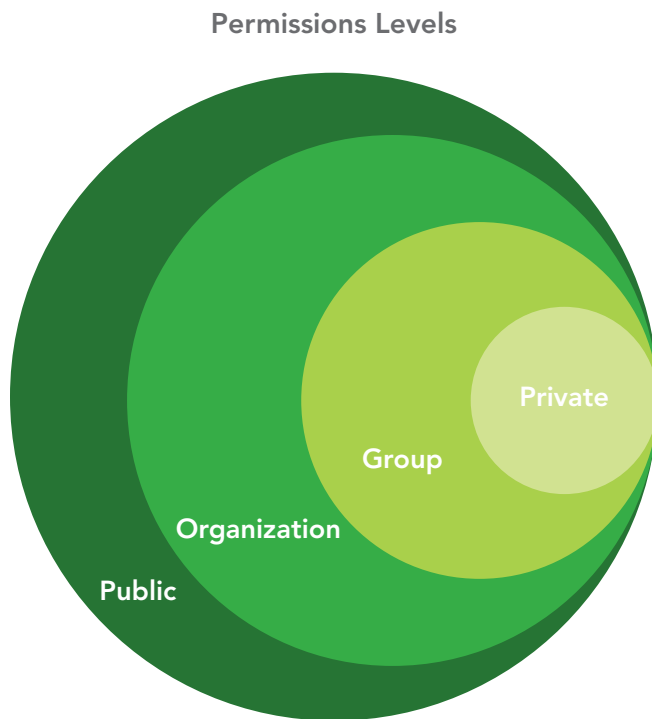
Everyone (Public): Accessible to anyone.

Your Organization: Accessible to any member of the organization.

Groups: Accessible to group members only.

- On the Share dialog box, check the box next to your organization's name (In the scenario, this would be the name of the environmental club's organization.)
- Click Done.

The map is now shared to members of your organization only. Organization members can search and find the map in ArcGIS Online, but people outside the organization cannot.



4. Creating a web app

You have decided to create a web app to present the data about the schools in the northern region. It will provide a simplified view of the map and a brief summary of what's being illustrated.

- Open the map from either the My Content or Item Details page.
- At the top of the map, click Share.
- Click Create a Web App.

- Review the configurable apps to find an application that provides a simple map viewer and a description summary.
- Click the Basic Viewer app option, and then click Preview to preview what that web app looks like. Optional: Try previewing other apps, and choose the one that works for you.
- In the app preview panel, click Create Web App.
- On the Create a New Web App dialog box, rename the web application.
- Click Done.

When the web app publishes, it opens with the Configure Web App page where you can change the style and information shown on the application.

Choose the style theme and information you want to your app to display. For example:

Application Title: 2018 Environmental Olympics

Application Subtitle: Location of Northern Region Schools

Details (required to save): Share this map with participants to gather information about other schools in the event.

In the Theme and Options tabs indicate such things as your color preferences or whether you want a Legend and Scale Bar.

- Experiment with different colors under the Theme tab.
- Review the customization capabilities on the Options tab and choose any tools you'd like to see in your app.
Note: The available options for you to edit depend on the configurable app you selected. Click Save, and then click Close.
- In the item details page, click the application thumbnail or View Application to open it.

5. Editing content

The app you created is built upon your original web map called 2018 Environmental Olympics: Northern Region Schools_(your initials). Anyone looking at the app you just created is looking at that original map embedded in your web app.

Therefore, if you want to make any changes in the app's map, you must modify these in the original map.

One of the schools in the northern region has had to drop out of the competition. You need to delete it on the original map so that the app will display up-to-date information.

- In ArcGIS Online, browse to My Content.
- Open the map: 2018 Environmental Olympics: Northern Region Schools_(your initials).
- Click Edit on the Menu bar.
- Click on one of the school symbols in the map window and an editable information window with school information will open.
- Click DELETE.

Note: Instead of deleting the school, you could update the information (for instance, if the school name is misspelled). You could also click New Feature in the Contents pane and add another school's location and data to the map. In this case, however, you want to delete a school's record altogether.

- Save the map.
- Browse to My Content again and open your web application to confirm that the school symbol has been deleted on that map too.

In a few easy steps, you've learned to:

- Share a map with your organization
- Select a web application with predetermined criteria
- Configure a web application
- Update a web application by making changes to the original map

Take some time to explore more symbols and web apps. If you don't like something you created, you can delete items and web apps, or make additional changes to the settings. See what you can find.

Remember, you can't break anything so have fun with it. The more you experiment with ArcGIS Online, the more comfortable you will be using it in your classroom.



Tips and Tricks for a GIS Enabled Classroom



A classroom that integrates geospatial problem-solving tools across all its teaching and learning practices is a GIS-enabled classroom. Teachers at every level are making this their goal because a GIS-enabled classroom:

- Develops problem-solving skills
- Cultivates critical thinking skills
- Fosters data literacy skills
- Employs cutting-edge technology to address real-world problems
- Supports collaborative learning
- Encourages the transference of learning across a range of academic disciplines
- Produces active and engaging learning experiences for students
- Is lively and fun

This section of the GIS On-ramp reflects some of the best practices and successful strategies that have helped other teachers achieve their goal of creating a GIS-enabled classroom. Consider this a very small sampler of possibilities rather than an all-inclusive directive.

1. Assessment

• **Static maps**

ArcGIS Online maps can be exported as PDF files and used in printed or digital reports and PowerPoint presentations.

• **Map of Proof**

Design a web map to convey an opinion or to advocate for change. For example, create a map to convince others of the vulnerability of site locations, or use a map to show how a location has changed over time. The two lessons below can be found in the [Curriculum Builder](#) and get you started on maps of proof.

- [How far can you see?](#)
- [Layering contemporary imagery with a historical map](#)

• **Backward Design**

Backward design is a method used in educational curriculum development. In web mapping, it involves presenting the learner with a finished map and requiring them to duplicate the map as an assessment.

• **Quantitative Results**

A map can be used to derive or retrieve quantitative measurements such as acreage, area, and population. An assessment can be based on the ability to correctly derive quantitative results to a query.

Below are just a few of the lessons that can be evaluated with quantitative results. They can be accessed through the [Curriculum Builder](#):

- [Obtaining information from imagery: Measuring the Rondonia rain forest](#)
- [Zaatari refugee camp](#)

- **Advanced: Web AppBuilder**

As students advance, introduce Web AppBuilder to allow them to create custom, map-based apps with ready-to-use widgets. The lesson below gives basic instructions on using Web AppBuilder. It can be accessed through the [Curriculum Builder](#):

- [Measuring WiFi using the Web AppBuilder](#)

2. Seizing the teachable moment

- **GeoNews**

GeoNews is a presentation that combines current events with geospatial technology. It offers a geospatial focus for a wide range of subjects and can provide real-world connections to many curriculum areas. It affords students the opportunity to look at geospatial news at all levels: global, regional, and local. GeoNews builds skills in the following areas:

- Manipulating a globe within a 3D environment.

- Searching for geographic locations.
- Presenting a message or story using geospatial technology.

GeoNews presentations can be either teacher or student generated.

Current Events in 3D: Broadcasting News is an example found in the [Curriculum Builder](#).

- Using Live Data

Esri provides layers of live feeds accessible in the ArcGIS Online Living Atlas. Live feeds provide data in near real-time enabling students to observe and analyze phenomena as they occur. Live feeds can be added to maps, story maps, and web applications provided you are signed in to an ArcGIS account. The Living Atlas provides the following live feeds:

- Weather warning and watches
- Current wind and weather conditions
- Storm reports
- Active hurricane/ tropical cyclones
- Recent hurricanes/ tropical cyclones
- Wildfires
- Hot spots

- Earthquakes
- Stream gauges
- Short-term weather warnings
- World traffic services

In the [Curriculum Builder](#), search for [Real Time Data: National Atlas](#)

3. Story Maps

Everyone has a story to tell. Harness the power of maps to tell yours. Combine interactive maps and 3D scenes with narrative text and rich multimedia content to weave stories that get noticed.

Story maps are an extraordinary educational tool with limitless classroom possibilities. With them, students can describe places, explore change over time, recount history, investigate environmental issues, or write about virtually any other topic they choose. Story maps foster the development of strong communication skills through their ability to combine the spatial visualization of maps with text, photographs, audio, and video data.

Note: Be sure that your students have learned the basic concept of GIS before introducing story maps. It is best to have students produce geospatially accurate maps, using layers of data first, before beginning the story map adventure. Remind the students that the map is the storyteller, not just an illustration for their narrative.

- **Student presentations**

Story Maps are ideal media for the presentation of student work — particularly the final presentation of a project. Esri provides a series of ready-made and easy-to-follow templates to create story maps. After creating just two or three story maps with these templates, students are able to identify the best story map template for their needs. The templates can be accessed from the [Story Maps Apps](#) page.

Each template includes a builder (to fill in the template), an overview with further links, a gallery of examples, a tutorial, and FAQs about that particular story map. Introduce your students to the concept of story maps with the [Story Maps Gallery](#). Several lessons in the [Curriculum Builder](#) provide practice in creating story maps of different types.

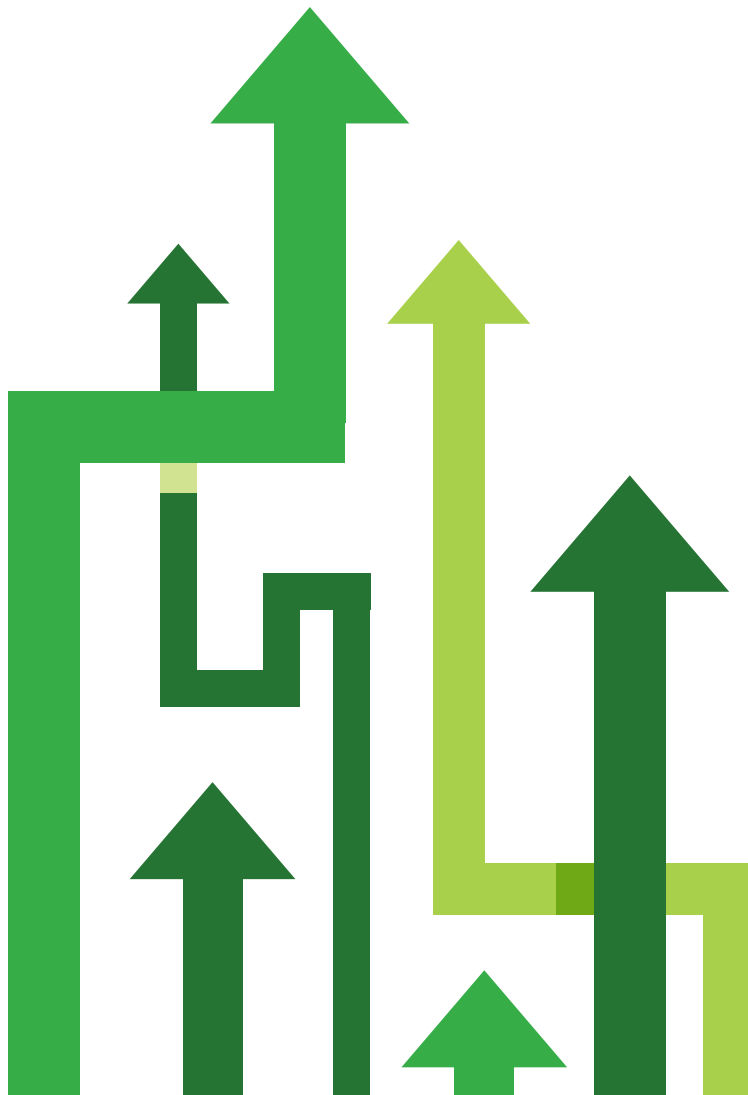
- [Creating a Basic Story Map: Cholera](#)
- [Create a Swipe Story Map: Graduation Rates and Unemployment](#)
- [Create a Map Series: Cities Through Time](#)
- [Create a spyglass story map :Washington, D.C. 1851 and Today](#)

- **Instructional**

Instructors can use story maps as a tool for instruction. This is a unique way to give instructions while exposing the learner to a tool.

- **Class Collaboration**

A group of students can work together to create a collaboration story map. This method consists of two parts. Part one is assigning a student a specific map, while part two consists of having someone in the group act as the technical production manager to put all the maps into a single story map. The Chesapeake Bay Landuse lesson in the [Curriculum Builder](#) could be implemented in this way with each state being assigned to a specific student.



GIS Curriculum Builder



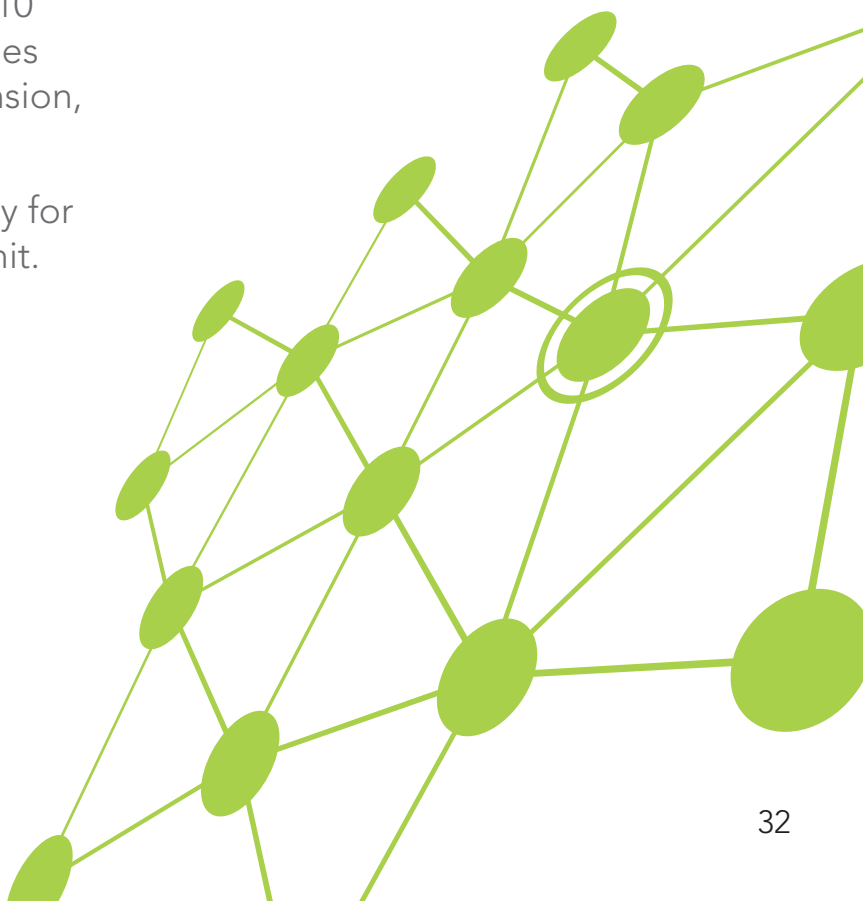
The [Curriculum Builder](#) enables you to create your own collection of GIS-enabled exercises for students. In the Curriculum Builder, you can explore, preview, and download classroom-ready lessons. The Curriculum Builder has over 90 lessons available, and more are being added all the time. Structured as a filtered database, the lessons are categorized and tagged, enabling you to identify the lessons that best fit your needs.

The filtering system in the Curriculum Builder is based on four variables. The following table identifies those variables.

| Experience Level | Capabilities | Account Required | Subject |
|-----------------------|--|---------------------|----------------|
| First (Beginner) | Visualization | No Account Required | Science |
| Second (Intermediate) | Analysis | Account Required | Social Studies |
| Third (Advanced) | Imagery Data Collection Time Enabled 3D Story Map Creating Apps | | |

The [Curriculum Builder](#) also includes 10 unit modules with introductory activities and questions for reading comprehension, reflection, and discussion.

Click [here](#) to download the answer key for the activities and questions in each unit.



There are five variables in the filtering system.

- **Experience Level** is the most fluid and generalized variable. The lessons that are designated as Beginner provide the user with experience implementing basic software functions in a wide range of contexts. The Advanced lessons emphasize the software's analytical functions in the context of increasingly complex subject matter.
- **Capabilities** provides information about the main software capability that is highlighted in the lesson.
 - Visualization allows you to explore and vary the way data is displayed using maps. Using symbols, transparency, and different types of classification, your students can present data by many compelling means.
 - Analysis allows the use of special tools to quantify patterns and relationships in the data and to display the results as maps, tables, or charts. One of the characteristics of analysis is, in most instances, the creation of new data.
 - Imagery can be used as a layer to collect quantitative data, as a layer with spectral information, or as a basemap.
- Data collection can be performed in a number of ways. Two field data collection tools are in the builder: Collector and Survey123. Both apps enable users to collaboratively collect data in the field, allowing GIS to go with us on our smartphones anywhere.
- Time Enabled capability means that layers contain the same locations at different times. The data is time aware and can be animated over time.
- 3D data can be visualized using the 3D Scene Viewer. The 3D Scene Viewer allows the user to create and interact with 3D maps.
- Story maps allow users to combine maps with narrative text, images, and multimedia content in interactive web apps.
- The ArcGIS Online App Builder allows users to build unique and specific 2D and 3D web apps.

- **Account Requirements** refers to software access—specifically, whether the learner will require access to an ArcGIS login. Remember, being a member of an organizational account provides you with access to rich software functionality. However, exercises that do not require an account are instantly available and provide a pathway to begin your exploration of GIS.
- **Subject Matter** identifies the best-fit content area for the lesson. Keep in mind, however, that these lessons are very flexible and may fit neatly into multiple curriculum categories. A lesson that fits well in a history class may be just as appropriate for earth science under some circumstances.
- **Duration** reflects the estimated time it will take for students to complete the lesson. This will vary with the experience of the learner.

In addition to the filtered access to the lessons, you can search the lesson database by specific tags that have been selected to provide more detailed information about the lesson. For example, a search for the tag “earthquakes” would identify lessons that are about earthquakes. Below is an illustration of the filter interface.

Explore the Curriculum Builder

Select exercises that fit the experience-level and subject matter of your class. All of the lessons are free to download and share.

Search:

Filter by:

| | | | | |
|------------|------------------|--------------|-----|-------|
| All levels | All capabilities | All subjects | All | Reset |
|------------|------------------|--------------|-----|-------|

Additional Resources

[Learn ArcGIS](#)

The Learn ArcGIS site is a collection of guided lessons utilizing the entire suite of Esri ArcGIS tools. Filter the product list to ArcGIS Online to locate more lessons like those in the Curriculum Builder.

[Esri GeoInquiries for schools](#)

GeoInquiries are short, standards-based inquiry activities for teaching map-based concepts found in commonly used textbooks. These lessons are intended for use in classes where only the teacher has computer access, or the goal of teaching GIS goes beyond the computing capabilities available to the students.

Latest Content

[View All Group Content](#)

| | | | |
|---|---|--|---|
|  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: May 11, 2018 View Count: 0</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 535</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 524</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 277</p> |
|  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 233</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 218</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 1,121</p> |  <p>Esri GeoInquiries™ collecti... by Geolnquiries</p> <p>Updated: Sep 5, 2017 View Count: 814</p> |

[View All Group Content](#)

[ArcGIS Online Help](#)

ArcGIS Online Help is the best resource for learning how to use the software in general and to perform specific tasks. The help resource is always up to date which is invaluable when working with a product that typically undergoes a software update every three months.

[The Living Atlas of the World](#)

Looking for data? The GIS community, including Esri, compiles and shares thousands of ready-to-use authoritative datasets in ArcGIS, covering everything from historical census data to environmental conditions derived from live sensor networks and stunning earth observations. And it's all in the Living Atlas of the World. Finding mappable, interesting geographic layers has never been easier.

[Story Maps Resource page](#)

Story maps use geography as a means of organizing and presenting information. They tell the story of a place, event, issue, trend, or pattern in a geographic context. They combine interactive maps with other rich content—text, photos, illustrations, video, and audio—within intuitive user experiences.

While many story maps are designed for general, nontechnical audiences, some story maps can also serve highly specialized audiences (for example, for briefing the president). They use the tools of GIS, and often present the results of spatial analysis, but don't require their users to have any special knowledge or skills in GIS. This has resulted in a veritable explosion of story maps. (Go to storymaps.arcgis.com to see them come alive.) As you click through to the various story maps linked in this chapter or at the Story Maps website, take the time to immerse yourself in the various narratives. These are information products that reward exploration.

ArcGIS Organization Management for a Classroom



Your ArcGIS Online Organization

ArcGIS Online is a formidable yet easy-to-use tool that anyone can use to make maps and display data. However, its power expands exponentially when you combine it with membership in an ArcGIS Online organizational account. An organizational account enables you to save and share your work in many ways, and provides access to a multitude of additional mapping and analysis capabilities. Although there are a number of activities in this implementation guide that you can complete without being signed in to an organizational account, we recommend that you get one to experience the added difference it makes. You'll be glad you did!

If you do not have an organizational account already, there are two ways to obtain one:

Join the Learn ArcGIS organization

The Learn ArcGIS organization is available for students, teachers, and others just getting started with ArcGIS. Follow this link to the [Learn ArcGIS organization](#) to activate a 60-day membership. With this membership, you can immediately begin to use maps, explore data resources, and publish geographic information to the web. Getting a Learn account is a quick and easy way to experience web GIS, but content is deleted after 60 days.

Esri Schools mapping software bundle

The ArcGIS for Schools Bundle is available at no cost for instructional use to individual U.S. K–12 classrooms, schools, libraries, and districts. Beyond the United States, the bundle is available to schools worldwide through Esri's network of international distributors.

Every public school, private school, home school, and youth service club is eligible. The software bundle includes the following:

- ArcGIS Online organizational and user accounts for teachers and students
- Ready-to-use web and mobile apps
- ArcGIS Desktop Advanced licenses
- Option of 50, 500, 2000, or 10,000 named users (Class, School, District)

Sign up at [Schools Mapping Software Bundle](#)

Set Up Your Organization

Congratulations on obtaining an ArcGIS Online organizational account for your students! Here are three things you'll need to decide when you first receive your organization and begin to go through the set-up process:

Pick a name for your organizational account

The organization name is what will appear in the banner on the home page. It should be a clear and complete name, since the home page can be public facing and has the capability to display student and teacher work.

Pick a short name for your organization

This is the way your organization will appear in the URL link to your home page (org-name.maps.arcgis.com). Pay close attention to the warning associated with the input of the short name.

Identify an administrative contact

Administrative contacts are those individuals whom Esri can notify with information about new updates to the system and whom you've authorized to speak with customer service for any technical issues. The designated administrator will oversee the organizational account. You may want to have your building IT person as another administrator in times where technical issues arise so they can also speak with customer service.

For questions about the Schools Mapping Software Bundle, contact k12schools@esri.com

For questions about ArcGIS software, visit [Esri Technical Support](#)

For questions about software orders, downloads, and account and license management, contact [Esri Customer Support](#)

What is an organizational account?

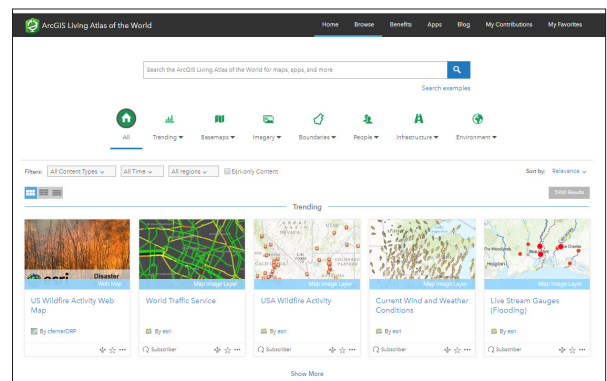
If you have not yet explored ArcGIS Online, go to the [Teacher's GIS On-ramp](#) at the start of this guide. Before getting into how to manage your organizational account, we recommend that you make some maps, find, display, and create data; get familiar with different symbols and smart mapping; and create some web apps.

It's also helpful to learn how ArcGIS users share maps and apps with others. As you begin to gather some content items in your account, it's a good time to become acquainted with how to manage things in the context of your classroom.

An ArcGIS organizational account consists of the following components:

- **Home Page:** Typically includes 8-12 premier items (maps and apps) that are most important for a visitor to discover and use, including a few apps showing curated content of different types. Create your item list so that the top items appear first.

- **Gallery:** includes a larger set of items (e.g. 100+ maps, apps, story maps, and data layers) that are categorized in meaningful ways that users can explore.
- **Groups:** As your item list grows, you can organize content into groups. Each group can represent a specific thematic category or provide a way to share information with a specific team, workgroup, or community. For example, you can see the group implementation in the [Living Atlas](#):



- **Users:** all of your students can be added to the account for you to share data, collaborate and create maps, and assess their work.

Personally Identifiable Information

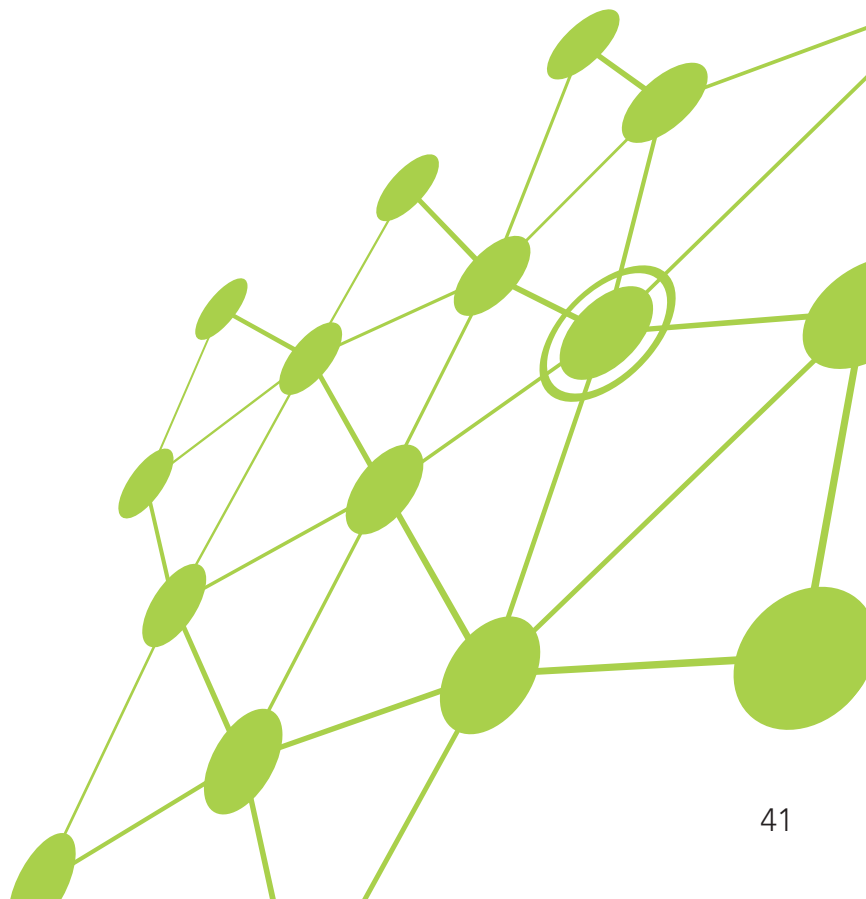
It is strongly recommended to minimize the sharing of students personally identifiable information (PII). You can avoid issues (legal or otherwise) with sharing student information with the following considerations:

Use a generic admin email when creating logins

An email is required when creating accounts for your students, so you will want to use either the teacher's email address or a generic admin email account. If one of your students forgets their password, this will allow you to reset it for them. If you decide to use your teacher email and you are creating batch accounts, we recommend you select the do not send notification email option to avoid being overwhelmed with notifications.

Create anonymous logins

Use a combination of sequential numbers, school, or class name for each account to generate unique user names. See [Bulk Creating Student Accounts](#) for more guidance on creating anonymous student accounts.



Setting up your organization can be done in these 5 steps:

1. Create a new organization in ArcGIS Online.
 - a. If you do not yet have an organizational account, refer to the section on requesting an organizational account from Esri.
2. Create a nice home page for the organization.
 - a. Nice graphic for the background
 - b. Set of featured maps
3. Create 1-2 groups in the new organization that can be used to feature content items (maps, apps, data, lessons).
 - a. Create 1-2 different featured content groups that can be used for gallery and home pages
 - b. Groups can also be used to share collections of exercises pulled from the Curriculum Builder. Simply create a group called Week 1 for example, and upload the individual lessons as Web Items that reference the URL to the lesson PDF.
4. Create new maps and apps (for example, story maps) using the Living Atlas.
 - a. Maps for basemaps, imagery, boundaries, demographics, elevation, population, and so on.

5. Publish additional maps and layers using publicly available data (e.g. Open Street Map, World Bank, etc.)

Steps to set up your organization:

1. Creating your login

You may have already created a user name when you first received the organization. If not, create a user name that is unique to you and your school. Note the following:

- If you ever delete the account, the username you created will not be able to be used again.
- If your school and your district decide to use ArcGIS Online, there may be a need to create systematic usernames that require you to add another new username. No worries, though: you can transfer materials between accounts at any time. Make note of your username and organization. Note: If you'd like to try some exercises that do not require logging in first, you can return to this section when you are ready to add new users.

2. Creating Student Logins

There are three options available for creating student accounts:

- If you wish to create accounts for your students in bulk (by class or by grade level), first download the [ArcGIS Online Login Template](#). This excel spreadsheet will allow you to bulk upload your students all at one time and will minimize

data entry errors associated with account creation. Then go to [Bulk Creating Student Accounts](#).

- If you wish to create accounts individually, see [Creating Individual Accounts](#).
- There is an option to Invite members to join using an account of their choice; however, we strongly recommend not using this for K-12 as students will then be creating their own usernames and passwords.

3. Setting up groups

The use of groups can be beneficial to you as the teacher in organizing student work and keeping track of student progress. It is important to think about how you will use ArcGIS Online with your students before you begin creating student accounts. Here are two primary uses for groups:

- a. Separating student work by class for easier grading
- b. Providing a work area for two or more students to work together

Separating student work by class

This option allows you to create a group for a class (or subject area) where all the students can be automatically added to the group when you create their accounts. This will be the easiest option to add students and will save time later. You

can add students to a group after accounts have been created either by searching for and adding students manually or by creating a unique tag that students can search for and request to be added to the group. In the case of the latter, you will need to accept the student's request.

Creating student work areas for collaborative work

Two or more students can create content for a common purpose and share with other students using a common group. You as the teacher can also keep track of group progress and grade content for the group. Organization administrators can also create groups that allow members to update items that have been shared with the group. Groups created with this item update capability are useful in collaborative situations in which multiple people need to update the same item.

Create Groups

1. **Sign in to ArcGIS Online and click on the Groups tab.**
2. **Click on Create New Group.**
3. **Name your group and provide a description.**

The description is optional and more for your reference to keep track of the purpose of the group.

4. **Create a tag.**
A tag in ArcGIS Online is a searchable keyword or phrase that is like a Twitter hashtag without the actual hashtag symbol. You will want to make the tag unique to the group so students and colleagues can search as needed for the group.

5. **Answer the following questions pertaining to the access you will allow to the group:**

Who can view this group?

Only group members:
If you want all content to stay within this group and not be seen by anyone else.

People in the organization:
This allows everyone who has a login to the school's organization to potentially view the contents of the group.

Everyone (public):
This is useful if you want anyone without a login to be able to view the contents of the folder.

Who can join this group?

Your answer here is based on the way in which you intend to enroll teachers in the group. Note: If you select Anyone, this gives access to anyone who may stumble upon the group in the public to potentially join the group.

Who can contribute to the group?

Your answer here is dependent on whether teachers will be contributing to the group, or if you as the administrator are using this group for content delivery only.

What items in the group can its members update?

You may allow members to edit other members' content (may be good for group projects); however, most choose to allow teachers to only edit their own items.

6. **Choose the way the content is sorted and displayed in the group.**

7. **Click Create Group.**

Create Accounts in Bulk

Use the [ArcGIS Online Login Template](#) to create a batch of student accounts.

- If you do not have excel, or the excel spreadsheet is not compatible with the spreadsheet program you are running, use the column headers explained below

Explanation of Fields

Email—Esri requires that all users have a valid email address. The main purpose of the email address is for instances when a password needs to be reset. Use either your email address or use a generic admin email address.

First Name/Last Name— Please refer to your school/district policies regarding the sharing of student personal information. You can share student work within ArcGIS Online with the public, which in most cases does not allow you to share students first and last names with the public. An example of alternative first and last name combinations is to use an abbreviated code for the school as the first name and a student ID number as the last name. In the case of Alpha Beta School and a student ID of

999999, the first name could be ABS, last name 999999.

Username—create a username that is unique to the school, student, district, etc. Consider the following:

- If the account is ever deleted, the username you created will not be able to be used again.
- If it is a simple or common username (for example, Joe Smith), that username may already be in use in the Esri network. In this case, the system automatically attaches a number to the end of the username based on the number of times that username has been used.
- It may be a good idea to use underscore (_) to separate items in the username to avoid duplicates in the network.
- For easier account management from year to year, consider adding in the current school year (18 = 2018) or the student's year of graduation. See Using Admin Tools for how you can search for and bulk delete accounts after the school year is over.

Password—The password you assign to all students is temporary and is only used to sign in for the first time. The students will then be prompted to change their password. An example of a password may be gis123456. Note: For elementary students, consider having all students in your class set the same password. This eliminates the possibility of students forgetting the password they set and you as the teacher having to constantly reset passwords.

Role—There are four roles that can be assigned to any member of the organization. In this column, you must type out the name of the role and have the correct spelling. The roles are as follows:

- Viewer: This level of user can only view and explore the maps and data in the organization. They cannot create content.
- User: This level is able to create maps and content and share the content, but they cannot do any analysis on the data.
- Publisher: This level is able to create, analyze, manipulate, and share maps and data.
This is the recommended level for students.

- Administrator: This is for those who will manage the user accounts and content. These are the only individuals who can add or delete users from the organization.

Level—There are two member levels, Level 1 and Level 2. When entering the level into the column on the spreadsheet, use only a single digit, 1 or 2.

- Level 1 member: Can view content, but cannot create, own, or share content. This is not recommended.
- Level 2 member: Can view, create, and share content.
This is the recommended level for students.



Add or Invite a Batch of Members in 5 Steps:

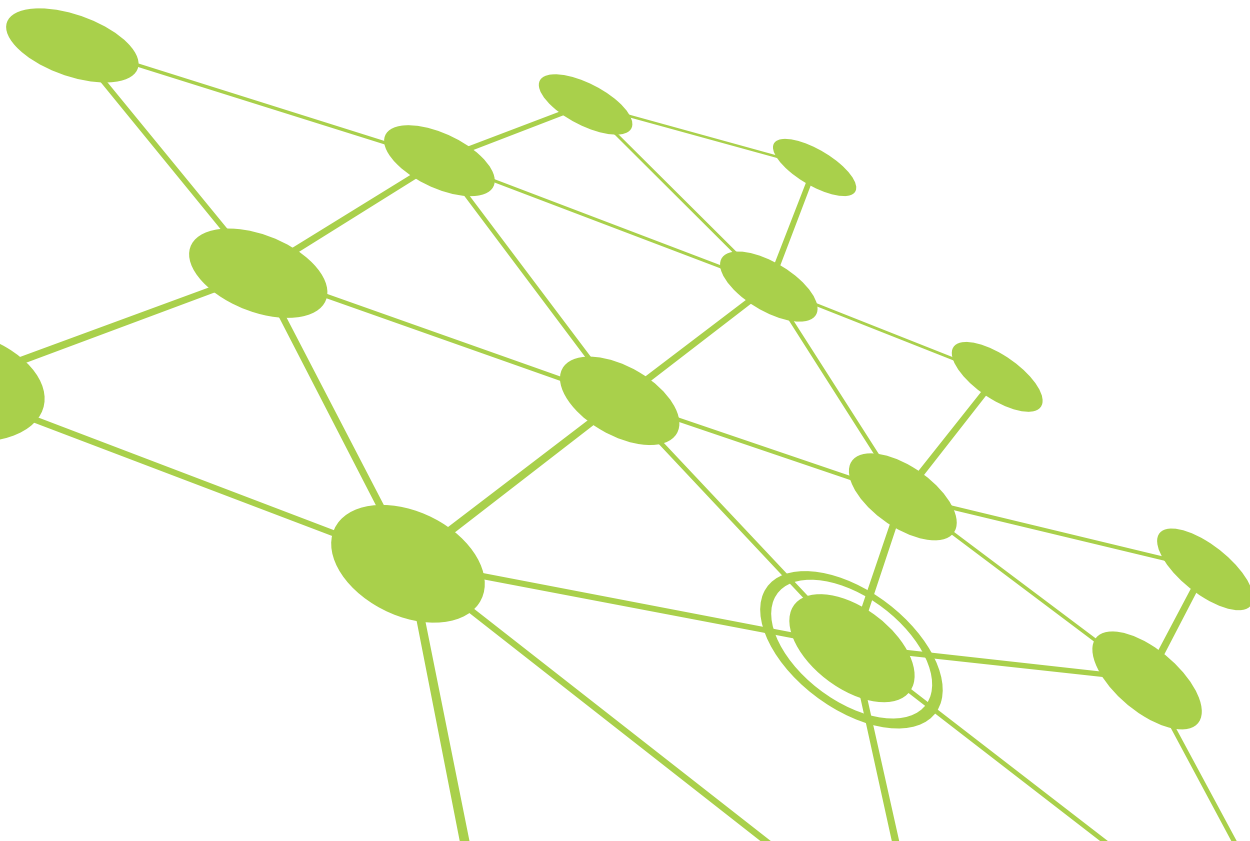
Step 1: Once you have filled out the [ArcGIS Online Login Template](#) with the users you want to enroll, save the spreadsheet as a .csv file (comma delimited).

Step 2: In the Organization page, click the Invite Members button.

Step 3: You will be asked which way you would like to invite members. For bulk upload, select Add members without sending invitations.

Step 4: Click on the From a File tab. Browse for the CSV file you just created. Once selected, click the Upload File and Review button.

Step 5: You will be asked to verify the information is correct for all members you are trying to add. If you would like to add these individuals to a group, click the Specify Groups button, and select the appropriate group. Note: Groups must be created first before you enroll students into a group. See Setting Up Groups for directions on how to create groups. When finished verifying the information and selecting a group, click the Add Members button.



Create Individual Accounts

If you are creating a small number of student accounts, or you prefer to create each account one by one, begin by clicking the Invite Members button while on the Organization tab.

Step 1: You will be asked which way you would like to invite members. For creating individual accounts where no email is sent to create the account, select Add members without sending invitations. If students have an email address, and you would like them to receive an invitation to join the organization through email, select Add Members and Notify Them Via Email.

Step 2: Regardless of the option you choose in Step 1, the default should be to choose the One At a Time tab. Complete each field in the form. Once selected, click the Upload File and Review button.

After completing the first individual user, you may add more by clicking the Add Another button.

Step 3: You will be asked to verify that the information is correct for all members you are trying to add. If you would like to add these individuals to a group, click the Specify Groups button, and select the appropriate group. Note: Groups must be created first before you enroll students into the group. See [Create Groups](#) for directions on how to create groups. When finished verifying the information and selecting a group, click the Add Members button.

For an explanation of the account fields, refer to [Explanation of Fields](#).

Managing Licenses for Your Organization

With every ArcGIS Online Organizational account, users have access to Esri's ArcGIS Pro and many other useful products. To access certain ArcGIS tools and products, you as the administrator need to assign a license to the user. A description of these additional products can be found [here](#).

1. To issue a license for these products, under the Organization tab, click on Manage Licenses.

You will see a list of products across the top with the number of licenses available and how many are still available (have not been assigned to a user). These products are associated with ArcGIS Pro, as indicated by the ArcGIS Pro tab being highlighted above the list of products. If you select the Additional Products tab, you will see a list of products that are available within ArcGIS Online.

2. Below the list of products, you will see a list of users in the organization.

To assign a license or set of licenses to All members, simply use the Select All link and select the license or licenses you would like to assign. For assigning licenses to individual users, use the Configure licenses link next to the individual member's name.

Managing Content Within Your Organization

When content is created by a user, the content item is stored within the Content tab in ArcGIS Online. To help organize the content, the user can create folders in which to place content items with a common purpose. The folders appear along the left side of the Content tab. Note that when a user is given a license for some apps, like Community Analyst, the app will create its own set of folders for which to store content created within the app. When saving content, the user can select where the content is to be stored.

As content is created, it is assigned a type based on how the content was produced. For example, when a map is created and saved, it appears in the content as a web map.

A feature layer is a thematic collection of similar geographic features; for example, buildings, parcels, cities, roads, and earthquake epicenters are feature layers. When a feature layer is created, a service definition layer is also created. The service definition layer holds the properties for feature layers—such as style, transparency, visible range, refresh interval, and labels—that control how the layer appears in the map. Using a feature layer, you can view, edit, analyze, and execute queries against features and their attributes. Therefore, both items need to remain together in your content. If you delete the service definition file and try to use the feature layer, the feature layer will not draw.

For frequently used layers, you can click on the star to the right of the item's name, and the item will appear under the My Favorites tab.

Use of Credits

For most institutions beyond schools, ArcGIS Online is a paid subscription service. Esri assigns each organization a set of credits that act as currency based on the use of some apps, analytical functions, and data storage that require services hosted in the cloud. As users run processes or as data is stored in the system, credits are used. For education, Esri makes these credits free. However, schools are asked to be mindful of the credits being consumed, and an Esri Customer Service Representative will instruct you on the use of credits as needed.

For a more in-depth description of the use of credits and credit usage by transaction, go to [Understanding Credits](#).



Featured Content

As administrator of the organization, you can choose to display teacher or student work on the home page of your organization. As a public-facing site, this could be a great way to show student work to the community. A specific group is used to access featured content for display. You must first create a group to populate with work. To access the feature content options:

1. **In the Organization tab, select Edit Settings**
2. **Click on the Home Page tab**
3. **Choose the group you would like displayed**

Gallery

Another way to show off student work is by using a gallery. As with the featured content on the home page, a gallery pulls work from a group. You can set up a group specifically for adding content that you want featured in the gallery, or you can point the gallery to a group that already exists. A gallery is a great way to feature the work for your class after they finish a project, as well as to rotate the group featured in the gallery among different classes.

Tip: Think of the featured content as a sample of all the work being done in your school, and the gallery as a way to feature all students in a class, subject, or grade level.

Admin Tools for ArcGIS Online

Esri has partnered with Geo Jobe to offer an app that you can add to your ArcGIS Online organization called Admin Tools for ArcGIS Online. You can find this app by visiting this website:

<https://www.geo-jobe.com/admin-tools/>

Or by clicking on the series of 9 dots located at the top of the ArcGIS Online website next to your username, and navigating to the Marketplace.

Admin Tools for ArcGIS Online gives you the ability to clean out your organization at the end of the school year by batch deleting content and accounts, removing or clearing groups, or simply changing the tag on groups of content at one time.

Frequently Asked Questions

Q: The student has forgotten their password. How do I change the email address and reset the account password?

A: On the Organization tab, find the student who needs their account password reset. Click once on the name and select Profile. Click the Edit Profile button and enter the desired email address. Save the profile and return to the Organization. Search for the student, and then under Action, select Reset Password in the drop-down list.

Q: What apps come with the Education Bundle?

A: Refer to the ArcGIS for Schools Bundle website for a description of all products included.

Q: How is ArcGIS Pro different from ArcGIS Online?

A: ArcGIS Pro is a more robust desktop GIS application from Esri. With ArcGIS Pro, you can visualize, edit, and analyze your geographic data in both 2D and 3D. You also have access to a much bigger toolbox for a wide range of advanced analyses and personal or team-oriented GIS projects.

Q: I only requested 50 users for my organization. Can I add more later if our program grows?

A: No problem. Contact [Esri Customer Support](#) and request more named users.

<http://learn.arcgis.com/en/educators/>

