

# 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.

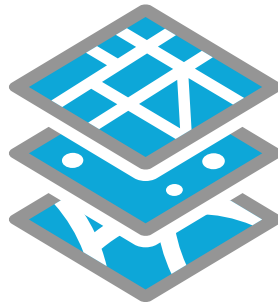
So far, you've been working with ArcGIS Online without the need to sign in. Additional lessons to increase your skill without signing in to an ArcGIS account can be found by using the [Curriculum Builder](#). Search for Software Access: Account not required.

# Anyone can make, share, and use web maps

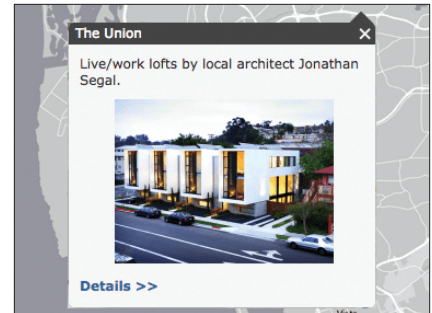
This map creation a pattern is something you can follow every time you start a new project:



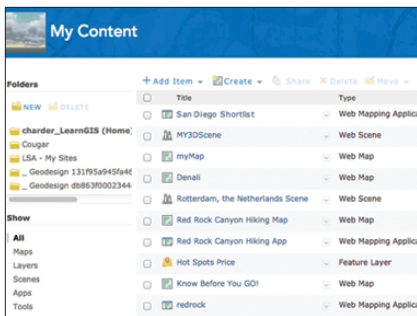
Select a basemap and zoom into your area of interest.



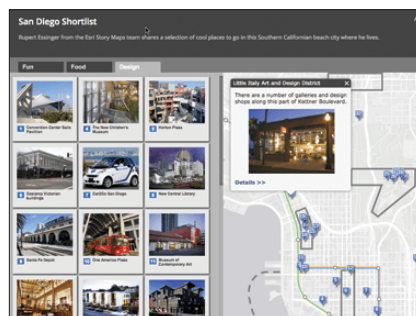
Add your data layers and specify how each will be symbolized and portrayed.



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](http://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](http://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.

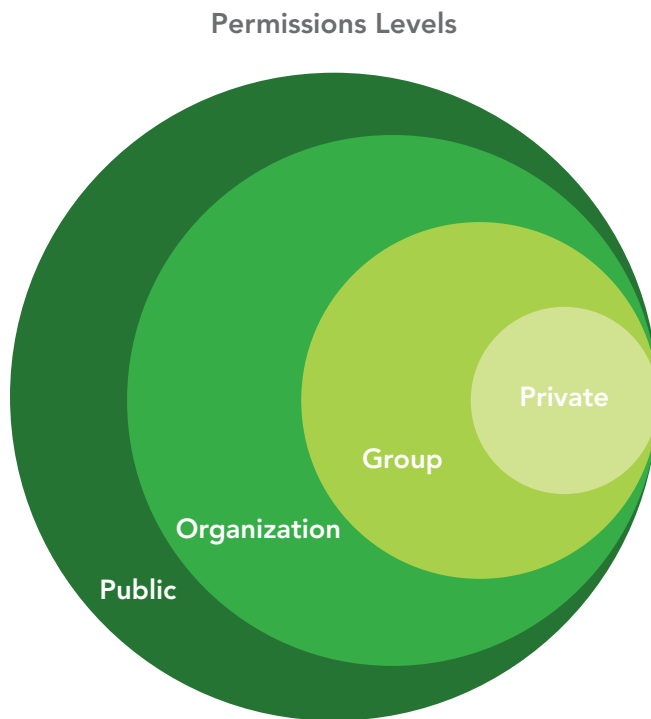
**Everyone (Public):** Accessible to anyone.

**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.

