

Publication Date:

May 2020

Teach with GIS for Classrooms

A teacher guide for integrating mapping and location analytics in any classroom.



Task checklist

TASK

1. [Start with GIS skill builders](#)
2. [Get tips for GIS-enabled classrooms](#)
3. [Explore the lesson library](#)
4. [Configure ArcGIS Online for your classroom](#)

COMPLETE

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1. Start with GIS skill builders

This implementation guide has user-friendly activities and resources to help you develop a geospatial toolkit for your classroom. It is a guide for building your own GIS skills and beginning the process of integrating geospatial technologies across your teaching practice.

If you are new to mapping and GIS, start by simply making a map. The first 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. To get started on building your foundation of skills, try these GIS Skill-Builders:

- **Skill-builder 1:** [Explore a web map](#) [15 minutes]
- **Skill-builder 2:** [Make a web map](#) [15 minutes]
- **Skill-builder 3:** [Share a web map](#) [15 minutes]

Before you get started

If you do not have ArcGIS, request your free [Schools Mapping Software Bundle](#)

If you are already a skilled ArcGIS Online user, run through the skill builders for a quick review or start searching a gallery of hands-on exercises in the [Teach with GIS lesson library](#).

If you are ready to start managing and configuring your organization, jump to [ArcGIS Online for classrooms](#).

2. Get tips for GIS-enabled classrooms

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 GIS-enabled classrooms:

- Develop problem-solving skills
- Cultivate critical thinking skills
- Foster data literacy skills
- Employ cutting-edge technology to address real-world problems
- Support collaborative learning
- Encourage the transference of learning across a range of academic disciplines
- Produce active and engaging learning experiences for students
- Are lively and fun

This section of the guide 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 sample of possibilities rather than an all-inclusive directive.

Assessment

How you leverage maps and GIS in your classroom will depend on the goals and outcomes you have for your students. Here are a variety of ways that you can assess their comprehension of GIS concepts:

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 [Teach with GIS lesson library](#) and get you started on maps of proof.

- Map of proof lesson: [How far can you see](#)
- Map of proof lesson: [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 [Teach with GIS lesson library](#):

- Quantitative results lesson: [Measuring the Rondonia rain forest](#)
- Quantitative results lesson: [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.

Web AppBuilder lesson: [Measuring WiFi using Web AppBuilder](#)

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 presentations can be either teacher or student generated. Try the lesson [Current events in 3D: Using a virtual globe to broadcast the news](#) to see how GeoNews can be applied to a spatial problem.

Using live data

Esri provides layers of live feeds accessible in ArcGIS Living Atlas of the World. 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 into an ArcGIS account. Living Atlas includes live feeds about current weather conditions, earthquakes, stream gauges, traffic and much more.

Try this exercise to put live data to work: [Real-time data: National Atlas](#)

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.

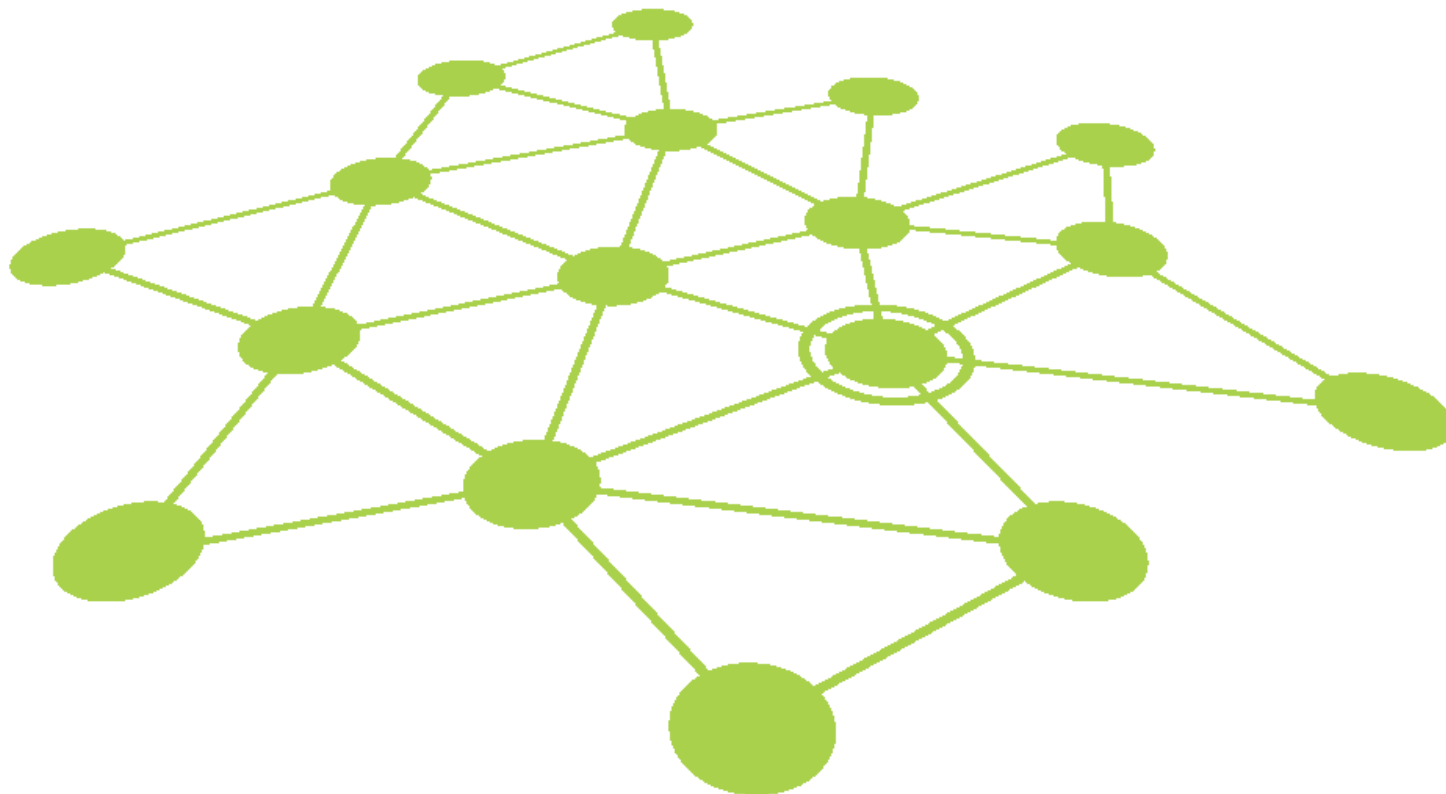
Story maps are an extraordinary educational tool with limitless classroom possibilities. With them, students can describe places, explore change over time, recount history, investigate environmental issues, or write about virtually any other topic they choose. Story maps foster the development of strong communication skills through their ability to combine the spatial visualization of maps with text, photographs, audio, and video data. They are ideal media for student presentation – particularly the final presentation of a project. You can also use story maps as a tool for instruction. This is a unique way to give instructions while exposing the learner to a tool.

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.

[Explore story maps through a discovery path](#)

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 one story map. The [Chesapeake Bay land use](#) lesson could be implemented in this way with each state being assigned to a specific student.



3. Explore the lesson library

The [Teach with GIS lesson library](#) enables you to create your own collection of GIS-enabled exercises for students. The lesson library allows you to explore, preview, and download classroom-ready lessons. The library has hundreds of lessons, 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.

Find the lessons the need

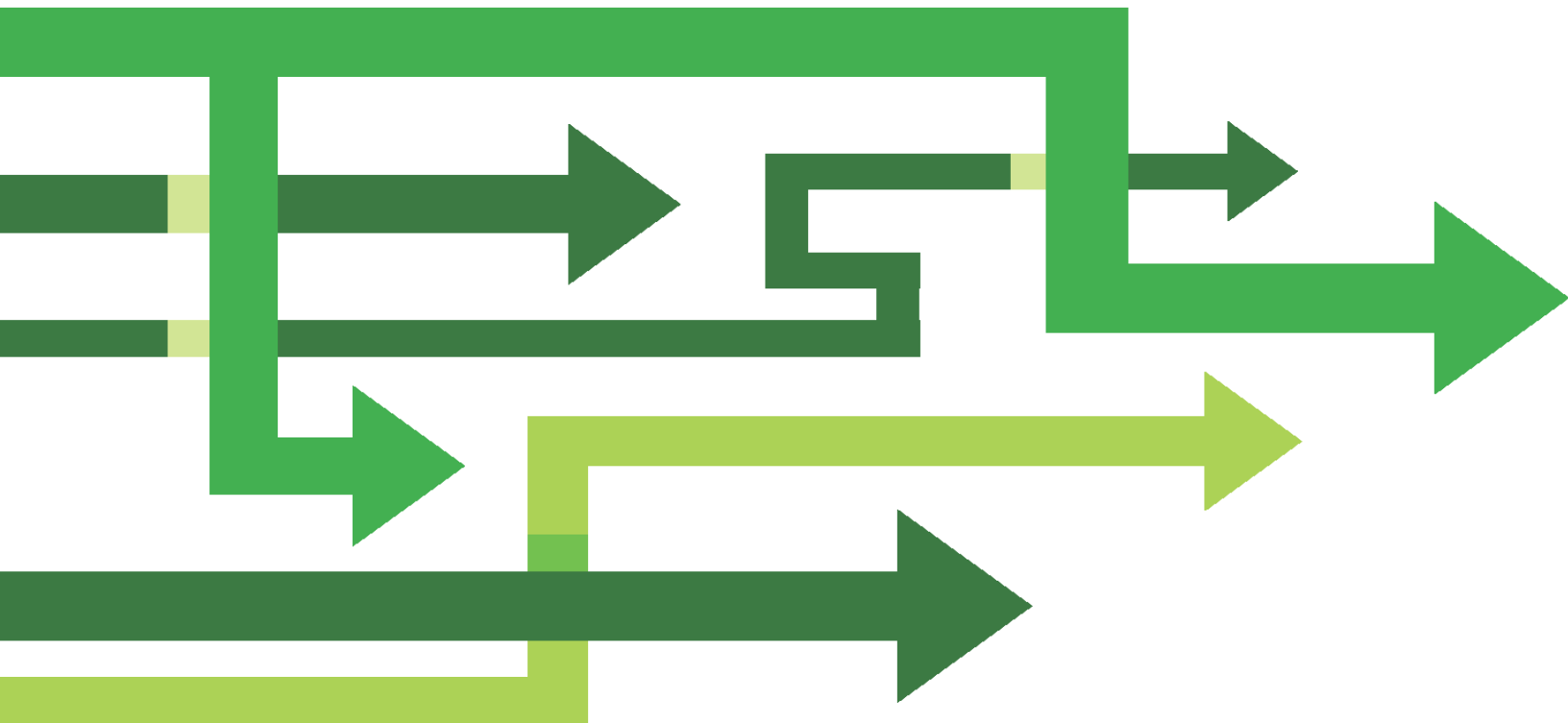
Use search and filters to find the lessons that make sense for your classroom.

- **Search**—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.
- **Experience Level**—The most fluid and generalized variable includes experience level. The lessons that are designated for 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**—Lessons cover wide variety of topics, also called capabilities. They include mapping, field operations, 3D, and spatial analytics.
- **Subject matter**—While subject matter captures the best-fit content area for the lesson, keep in mind, that these lessons are flexible and may fit into multiple curriculum categories. A lesson that fits well in a history class may be just as appropriate for earth science under some circumstances.
- **Account requirements**—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.

- **Region**—Lesson data and scenarios take place around the world. Filter for your region of interest.

Additional resources

The lesson library also includes 10-unit modules with introductory activities and questions for reading comprehension, reflection, and discussion. [Download the answer key](#) for the activities and questions in each unit.



4. Configure ArcGIS Online for your classroom

ArcGIS Online is cloud-based mapping and analytics software that you can access via a website. You can configure a customized experience that makes sense for your school. For example, you set the security and sharing policies, assign privileges and credits to members based on the work they need to do, and configure your home page and gallery to reflect your school or district. You can also integrate your enterprise single sign-on system.

Get started

If you don't have an ArcGIS Online yet, you can request an [ArcGIS for Schools Bundle](#). You and your students can also join the Learn ArcGIS organization for a free, temporary membership to try ArcGIS Online. The membership includes all the software and data you need to complete the entire library of lessons.

ArcGIS for Schools 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.

Learn ArcGIS

If you're not ready to request your own ArcGIS Online organization yet, but would like to try doing GIS, you can also [become a member of Learn ArcGIS](#) for 60 days.

The Learn ArcGIS organization is a sandbox for students, teachers, and others just getting started with ArcGIS. All the lessons, data, and web maps on Learn ArcGIS are free and publicly available. If you become a member, immediately begin to use maps, explore data, and share maps to the web. A Learn account is a quick and easy way to experience web GIS through real-world, problem-solving scenarios.

Set up ArcGIS Online

ArcGIS Online is a formidable yet user-friendly tool for anyone 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 activities in this implementation guide that you can complete without being signed into an organizational account, we recommend that you get one to experience the power of GIS. You'll be glad you did!

Get the essential tasks and best practices for setting up ArcGIS Online

For details on how to set up ArcGIS Online, see the [ArcGIS Online implementation guide](#). It highlights the key steps, tips, and best practices for configuring the website for your needs.

Tips

Below are some additional tips to help you get the most out of ArcGIS Online for your classroom.

Minimize 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.

Add batch of students—Quickly add students to ArcGIS Online using a spreadsheet. Follow these [five steps to batch upload student accounts](#).

Feature your classroom 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.

Show off work through the 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.

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.

