ArcGIS Online SkillBuilder Activities for Education

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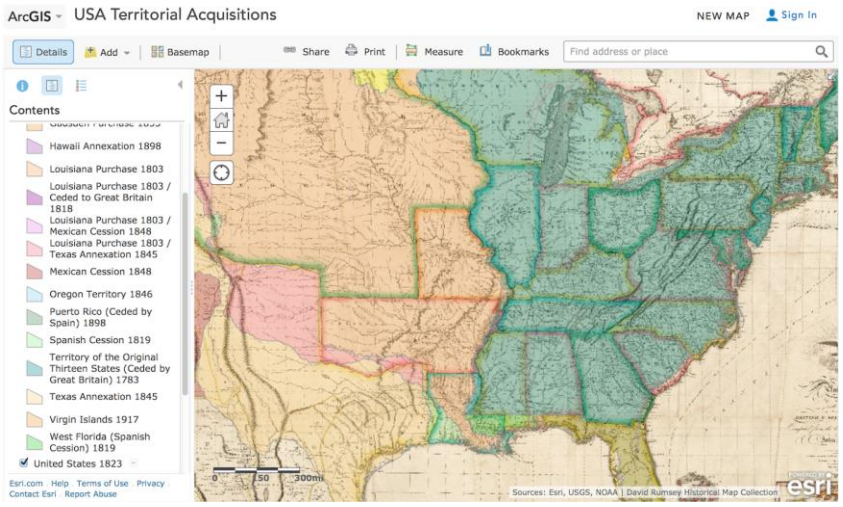
Make maps, analyze data, learn content, build capacity for community, college, and career



Level One: Explorer, using ArcGIS Online without sign-in

- Set One: Definitions
- Set Two: Principal skills

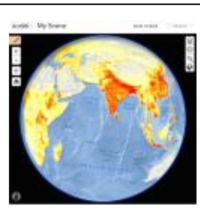
Level Two: Cartographer, using an ArcGIS Online public account

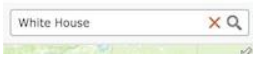
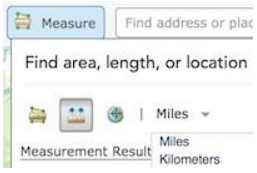
- Set Three: Expand the universe
- Set Four: Add map content
- Set Five: Begin analysis
- Set Six: Access map data from other software
- Set Seven: Finding help

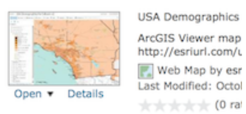
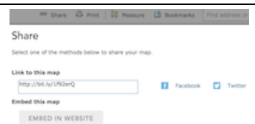
Level Three: Geoanalyst, using an ArcGIS Online Organization account

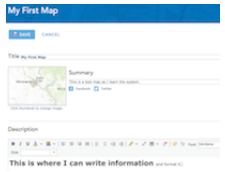
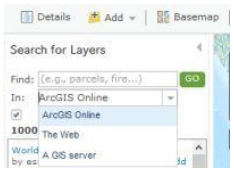
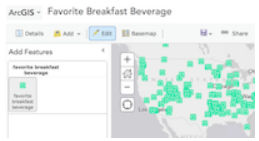
- Set Eight: Expand the basics
- Set Nine: Expand the analysis
- Set Ten: Go pro

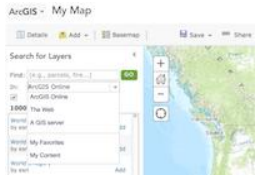
Skills, activities, resources, and challenges to help teachers and students build capacity in GIS to explore the world, understand the community, and solve problems using ArcGIS Online

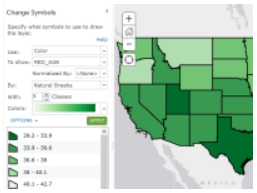
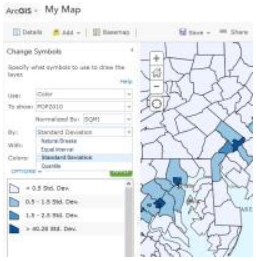
1	LEVEL & SET = = = = = = = = = = = =	ITEM DESCRIPTION =	EXAMPLE OR TASK =	DONE = = = = =
2	**LEVEL ONE: EXPLORER**	**Begin exploring the world without even logging in anywhere.**		
3	**L-1, Set One: Definitions**	It helps to understand a few key terms in order to talk effectively about what one is doing.	**See the example and do this task.**	**Got it? Check it!**
4		**Maps** = Displays about an area of the world which the viewer can use and alter (such as by adding new contents); tend to have a generic interface; a user can often save a copy of someone else's map into the user's own account; after creation, maps can be turned into apps (expressions of data).	Here is the starting earthquake map that was used to make the app and the presentation in the row below.	
5		**Apps** = Displays based on a map, which the viewer can use but typically not enhance and save; tend to have a custom interface and focused content. (If an app is a "finished project," a map is still in a "construction zone environment.") Apps include "Story Maps" and "Presentations."	Here is an earthquake app that was made from the map in the row above. Here is an earthquakes presentation that was made from the same map.	
6		**Layers** = Sets of data about places ("features" {points, lines, areas} and "images") for use in one or more maps or apps; they can be stacked in a map in a sequence, like parts of a sandwich; users typically can control which layers are visible in a map, and can sometimes control those visible in an app.	The earthquake map and app above both have a basemap image and two layers of earthquake points. See various contents that can be layers in maps and apps. See also the Geographic information section in Help for ArcGIS Online.	
7		**Tools** = Widgets in a map/app that let a user change the display and/or accomplish a task (e.g. zoom, measure, add data); the map/app may have few or some or many tools, and they may be generic (consistent look and location across many maps) or custom (specific to a given app).	The earthquake map above has many tools, if you know where to look; the earthquake app above offers few tools. Look carefully to find both similarities and differences. What are they?	
8		**Scenes =** Special displays about the world, in 3D, allowing rotation on three axes. These require a recent web browser with enough power, so computers can work but tablets or smartphones do not (yet). This will be the only reference to scenes in this doc, but concepts and skills gained from 2D maps and apps transfer well to 3D scenes.	See this blog about 3D scenes and, if on a Win/Mac/Chrome OS computer (not on a tablet or phone), try clicking the images. If the browser can display the live maps, explore.	

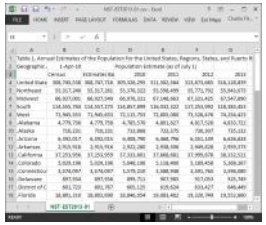
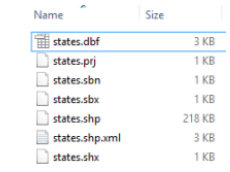
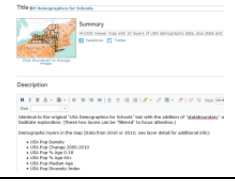
9	**L-1, Set Two: Principal Skills**	**Viewing** and **exploring** are fundamental tasks that mapmakers and users alike do in a map constantly. You can build these skills even without logging into ArcGIS Online.	**See the example and do this task.**	**Got it? Check it!**
10		**Pan** = Move around the map, typically by just grabbing on the map and sliding to change the area shown. Double-clicking in a spot also zooms in and moves that spot to center.	Try it on this map of USA territories, or see the Navigation section in Help for ArcGIS Online.	
11		**Zoom** = Change the display to show more area (often with less detail) or less area (often with more detail). Use buttons, the mouse's scroll wheel, or double-click on the map. To zoom into a box, press the shift key and then click-hold-drag with the mouse to highlight a zone, and let go to zoom to the zone.	Try it on this Story Map app about Washington DC, or see the Navigation section in Help for ArcGIS Online.	
12		**Choose basemap** = Decide which of several standard (or many custom) base displays works best for exploring in your map; custom apps may or may not allow changing the basemap.	Try it on any map/app above, or this map of current USA weather conditions. Look for the word "Basemap" above the map/app, click it, and choose one.	
13		**Change what is visible** = Set layers to display or not; maps have standard checkboxes for layers, in "Contents;" apps may or may not allow the user to change visible layers, or may permit it through custom means, such as clicking on a tab, clicking on a row, choosing from a pull-down menu, and so on.	Try it on any map above. Then try this Story Map app on commuting. Then try this Story Map app on tornadoes, to see another style.	
14		**Click features to get info** = Characteristics of a given feature may be available by clicking or tapping on it; the map maker may decide to disable this for a layer, or may permit it, and customize how items are displayed; sometimes you will see "1/4 < >" at the top, and can scroll features, using "< >".	Try this map of USA demographics. Click on a feature to see info. What do you get when you zoom in, or change what layer is visible?	
15		**Find** = Use the search box (at top right corner of map) to type and choose a location based on place name, major landmark, street address, or set of "X,Y" coordinates (longitude first, then latitude; use "-" for W or S).	Try some locations. Then see the Search/ Locate addresses and places section in Help for ArcGIS Online.	
16		**Measure** = Determine the area of a polygon, length of a line, or location of a point, using various units. Some custom apps use the measure tool to launch a new capacity, such as an elevation profile for a line.	See the Measure section in Help for ArcGIS Online. Then, see how the Elevation Profile app uses the "measure a line" tool.	

17	**WANT MORE?**	With just these skills, you can work with many maps and apps, and there are many examples that can help students and educators. Here are two great places to see more maps and apps: • Series of interactive map apps, about imagery, basemaps, communities, people, earth, and life. • **Story Maps** = Map applications focused on a particular topic. Choose "Gallery" to browse by app style, general theme, or specific topic. • Maps & Apps Collections, "ready to use." Go to the K12 GIS Organization and choose Button #02.		
18	**LEVEL & SET** **============**	**ITEM DESCRIPTION** **==**	**EXAMPLE OR TASK** **===========================**	**DONE** **=====**
19	**LEVEL TWO: CARTOGRAPHER**	**Develop powerful skills and learn to create and share content using an ArcGIS Online Public Account**		
20	**L-2, Set Three: Expand the Universe**	Just looking around at a map is a good start, but modifying an existing map, or building a layer from scratch, then saving your creations, and sharing these layers/maps/apps with others, lets you add knowledge to the world.	**See the example and do this task.**	**Got it? Check it!**
21		**Open a map or app** = Find a link to a map or app, and perhaps a description and thumbnail, and click it to open and explore.	Try any item from this collection of "Maps We Love" (linked from Button #02 of http://esriurl.com/k12gis).	
22		**Share a link to a map/app via email or social media** = Use a button to launch options for a link, permitting you to share the resource with others.	Look for "share" or "link" options in both maps and apps. Then see the Share section of Help for ArcGIS Online.	
23		**Get an ArcGIS Online public account and log in** = Set up a free public account where you can save maps, apps, layers, and other contents. (Educators should see also "AGO Use Strategies.")	See this short video about using a free public account, and this short video about signing up for an account. Sign up for one, then sign in here.	
24		**Save a copy of an existing map in your account** = Sign into your account first, then open up an existing map (not an app), and save a duplicate version in your own account. Using "Save As" to save someone else's map in your account just saves a copy of their map, including whatever changes you have made.	Sign in to your account first, then open a map (not an app) from this collection of world maps and apps (linked from http://esriurl.com/k12gis, #02). Save a copy in your account.	
25		**Create a map from scratch** = Sign into your account first, then set your basemap, zoom in, and add "Map Notes" to your map to show important features. Even these basic maps can be analytical.	See the Create maps and Add map notes sections of Help for ArcGIS Online. Then watch the Route to School video and do the Route to School map.	

26		**Save a map you created or modified** = Having first signed into your account and created a map from scratch (or opened and modified a map), choose "Save" to save the current layers and map extent.	After signing in and then making your map (or modifying someone else's map), click "Save," add some information, and save the map in your account.	
27		**Use metadata about maps** = "Metadata" is information about the map. Refer to these details for notes from the mapmaker, such as the map's purpose, or where the data come from. From the "About this Map" button, you can access "More Details."	Open any map (not app) above, then click the "Details" button, then "About this map", then "More Details." Examine the information available (such as here).	
28		**Create metadata for your map** = View your map details, click "Edit", add and format key information that may give the viewer essential facts about your map, and click "Save." Good metadata lets users know if they trust the map and its contents.	For the map you saved above, create metadata about the map's purpose, data, date of creation, and so on.	
29	**SELF CHECK**	Time to see what you can do. Can you create a map, change the basemap, add map notes, save it, and add metadata? Watch the Month of Activities video and then do the Month of Activities map.		
30	**L-2, Set Four: Add Map Content**	Maps may come with information but adding data can make it better for your needs. There are several ways to add data.	**See the example and do this task.**	**Got it? Check it!**
31		**Add layers to a map** = Maps can be enhanced by adding layers of additional data. Many, many data sets are available, and various formats are possible, each with its special characteristics and procedures.	See the short Add Features video. See also the Add Layers section of Help in ArcGIS Online.	
32		**Add/enhance Map Notes in a map** = Map Notes can provide basic info on the map, but they can also be quite extensive and informative, even carrying the viewer on a journey or providing links to additional information. (Also see "AGO Use Strategies" and "Making a Group Map".)	Open this map about Alexander the Great, and explore the different notes that the mapmaker has assembled. Notice how providing rich information can tell a story, even with basic techniques.	
33		**Add additional data to a layer designed for user input** = Some mapmakers want viewers to add data into an existing layer in their map, so they create a map with an "editable feature service," in which users can add features, according to what the mapmaker permits.	Open this map about breakfast beverages. Zoom to your location, click "Edit," click the mug in Contents, and click on the map to add a point. Use pull-downs or type to add data. Click "Close." Click "Details." Check the map's metadata.	

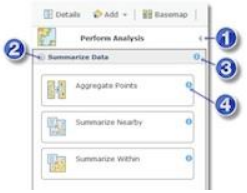
34		**Add new layers (services)** = Many useful "ready-to-map" layers are available in ArcGIS Online, layers which can be added into any number of maps. In searching for layers, pay special attention to the area being searched. (Note checkbox "Within map area.") Be sure the region of interest is showing in your map when you search, but be careful about zooming in too close (focusing too narrowly) or out too far (including too much).	Create a new map and zoom to the world. Choose "Add/Search for Layers". With the "In:" pull-down showing "ArcGIS Online", type "world population density" (use quotes). Find one by Bonnie521 and click "Add". Click "Done Adding Layers" to return to Map Contents. Click "Legend."	
35		**Add new layers (tables)** = Properly formatted text tables (.txt or .csv) with good latitude/longitude data can be mapped easily, just by dragging and dropping the file onto the map. (For help building tables, see also Row#45 below.)	Click this link to get a text table of significant earthquakes from the last month. Save the table as "quakes.csv" on your desktop. Create a new map, then drag and drop the file onto the map. Click the features to examine contents.	
36		**Add new layers (shapefiles)** = Zipped shapefiles (point, line, or polygon features, plus their attributes, created in ArcGIS Desktop) can be added into a map, using "Add/ Add layer from a file." Many such geographic data sets, built by professional GIS users, are available online. Try an internet search using the terms "{my state name} GIS data."	Download a simple zipped shapefile of the 50 US states. Then, try creating a new map and adding this file to your map, using "Add/ Add layer from a file."	
37	**SELF CHECK**	Time to see what you can do. Can you create a map of a region with three specific and different data types, save it, and add metadata? Log in to your account and create a new single map using **(a)** the world population density service used above, plus **(b)** the earthquake table used above, plus **(c)** the zipped shapefile used above. Save it and add metadata.		
38	**L-2, Set Five: Begin Analysis**	Maps can show a lot of data, but that power is multiplied by using the map to analyze the data, which helps to show patterns and relationships. Basic analysis involves changing the appearance of the data according to some characteristic.	**See the example and do this task.**	**Got it? Check it!**
39		**Change layer visibility and transparency** = Modify the ability to see a layer and see through a layer, to provide appropriate detail, help a viewer keep track of location, or see relationships with other layers. Maps typically allow this for all layers (transparency only for basemap); apps vary in permitting this. Layer visibility and transparency are parts of "styling," below.	See the Set visible range and Change transparency sections of Help for ArcGIS Online. Open this map of ecoregions in the US 48 states, and explore the impact of transparency at different scales	

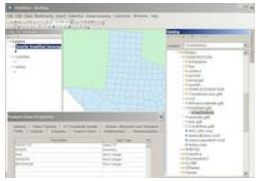
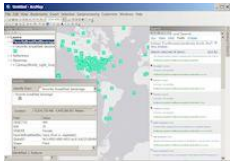
40		**Style data** = Beyond just layer visibility and transparency, above, using different symbol sets for features within a data set based on their characteristics is a powerful way to highlight or de-emphasize patterns. Symbolizing goes hand-in-hand with classification, and mapmakers constantly explore different ways to symbolize data. This is one of the most powerful capacities a mapmaker has, and should consider many factors. It requires experimentation, practice, and thoughtful study of many maps.	See the Change styles section of Help for ArcGIS Online. See this brief Intro to Map Design for the basics of cartography, including the relationship between classification and symbolization.	
41		**Classify data** = Choose how to subset a group of features, in order to explore and display the patterns and relationships. Classification and symbolization go hand in hand, and need to be explored together. How one classifies and symbolizes data may accentuate or diminish the visibility of differences. The same data can be classified in many different ways, and users may decide (consciously or not) to use methods that are "more appropriate" or "less appropriate." It is essential for mapmakers to explore and learn about classification and symbolization.	See the Classification methods section of Help for ArcGIS Online. Note the additional link to Classifying (in Help for ArcGIS for Desktop), for more info. See this brief Intro to Map Design for the basics of cartography, including the relationship between classification and symbolization.	
42		**Query or filter data** = Select members of a group that meet certain criteria, or modify the data to include only those members. When exploring, it can help to emphasize just a certain subset temporarily, or even eliminate the others to reduce distraction and emphasize patterns and relationships. (No filters possible on map notes or layers from added files.)	Watch this video about using tables and filters. See the Apply filters section of Help for ArcGIS Online. Try this USA Demographics map and set the County Boundaries to show just a single state.	
43		**Show, sort, and modify a table** = Display and explore the table for a feature layer in a map. Features in each layer have consistent data elements, and looking at both the table and the map can show patterns and relationships. Tables can be sorted, records highlighted, and fields hidden or shown.	Watch this video about using tables and filters. See the Show tables section of Help for ArcGIS Online. Try this map of Recent Earthquakes and explore the tables. Are the layers different?	
44	**SELF CHECK**	Time to see what you can do. Can you re-create the earthquake map if you "undo" the classification and symbolization by changing the layers to "single symbol"? Open the Recent Earthquakes map. Set the symbol for each layer back to "Single symbol." Then re-construct the original classification and symbolization. (Make a mistake? Just refresh the map and try again.)		
45	**L-2, Set Six: Access Map Data from Other Software**	ArcGIS Online has a lot of data, but users can also bring in and use data of different types that were created in other tools, multiplying capacity. Each type has advantages and limitations, and users must understand how to work with them.	**See the example and do this task.**	**Got it? Check it!**

46		**Identify and use good data tables** = Examine a data table and determine if it can be mapped as is, in ArcGIS Online, or if it needs to be modified. Point data require accurate longitude/ latitude or address info. Tables about polygons (e.g. about US states) require attachment to external data that can draw on a map. Useful tables appear in all kinds of formats and open up vast amounts of data for mapping, if the tables include or can be associated with proper geographic data.	See the CSV,TXT,GPX files section of Help for ArcGIS Online. See also these blogs and associated resources for help: • blog+lesson on designing tables • blog+lesson on troubleshooting tables • blog+video on table to map to app • blog+lesson on adding fields to polygons	
47		**Identify and use zipped shapefiles** = Many shapefiles are available from professional GIS users; if they are reasonably sized and properly formatted and zipped, these shapefiles can be added to a map.	See the Shapefile section of Help for ArcGIS Online. See this blog+lesson on adding fields to polygons for a sample shapefile and idea on how to enhance it.	
48		**Understand and create GPX files** = Global positioning system (GPS) devices and apps on GPS-equipped smartphones can export generic files that can be drawn directly in ArcGIS Online. Mastering the export process from any given device or app may require reading its documentation or conferring with a mentor.	See the CSV,TXT,GPX files section of Help for ArcGIS Online. See also various blogs about using GPS and ArcGIS Online in instruction.	
49		**Understand and use KML/KMZ** = Keyhole Markup Language files (or zipped versions) can be created in several different external software packages, and are commonly found online. They can be added as reference files in ArcGIS Online.	See the KML files section of Help for ArcGIS Online. See also this blog post for valuable guidance on using KML and KMZ.	
50		**Understand and use metadata** = "Metadata" is "information about the information." Users must read metadata, interpret it, and make decisions about the appropriate use of given data sets for a specific task. The same data may be sufficient for one user but inadequate for another user. Good data creators will document their information in such a way that most users can make an informed decision. Users should read it and decide.	See the Item details section of Help for ArcGIS Online. See generally well-documented information about a set of groups, maps, items, and users. Look for details that provide enough information to help you decide if you could use it effectively.	
51		**Create appropriate metadata** = Practice good data/map/app creation by providing good details about posted layers and maps so others can decide what might be or not be appropriate for them. This also helps the data/map/app creator who, at some point after creation, needs to recall important information.	Sign in to your account and go to "My Content," and compare details visible in the area above to the details about your items. Document items you want to keep, whether or not they are shared.	

52	**SELF CHECK**	Time to see what you can do, adding several different data sets into an existing map. Sign into your account and make a map with these four layers. **(a)** Add a US 50 states shapefile.zip. Download the file and add it as a file to the map. **(b)** Add a one-day quake table (CSV). Download the table and add to the map, or add from the web as a CSV file. **(c)** Add a 75-mile GPX file. Download the file and add it to the map. **(d)** Add a KML file of the Region 18 (California) stream data. Save it to your computer, then add it as an item into "My Contents, then add it to the map. Symbolize any "plain" layers, save the map, and add metadata.		
53	**L-2, Set Seven: Finding Help**	ArcGIS is a platform. Sometimes it is challenging to know how to move forward when there are many options. There are many helpful materials you can use, and should use regularly. You can also find a GeoMentor -- someone who uses geographic tools and can offer assistance.	**See the example and do this task.**	**Got it? Check it!**
54		**Search Help** = Use multiple sources of assistance on Esri's website and beyond, in search of ideas, options, procedures, or best practices. Documentation and guidance come in many forms, each with advantages. GIS users often need to consider multiple sources.	Visit and explore Help for ArcGIS Online. See the tabs atop the page and links throughout: see intro; see videos; see FAQs; see tutorials; see blogposts.	
55		**Explore lessons** = Use lesson collections that offer guidance for particular subject matter, approaches, tools, grade levels, or experience levels.	See the "GeoInquiries lesson series" for ready-made maps with guidance, plus "Mapping Our World for ArcGIS Online"	
56		**Work with a GeoMentor** = Work on a repeated basis with a "geo-savvy" person who can help you use ArcGIS Online to accomplish your goals. GeoMentors can help you solve problems with technology, with data, with GIS strategy, and much more. If they don't know the answer immediately, they often know a strategy for finding an answer. But they need you to communicate effectively what you need.	Put your dot on the "Educator seeking a mentor" map. Find a mentor who can help you engage GIS effectively in your setting, meet your needs. See http://www.geomentors.net.	
57		**Be a GeoMentor** = Help an educator or student use ArcGIS Online. Even when you don't know everything (no one ever does), you can be a good mentor by providing appropriate guidance, according to what a learner needs. Sometimes it is a simple answer, sometimes it calls for extended conversation. Communication is key.	Find an educator or student whom you can help engage GIS effectively. See http://www.geomentors.net.	
58	**SELF CHECK**	Time to see what you can do. Complete the series of 5 challenges of the Center for Hawaiian Island Analysis. If you can do these and have in mind your own projects, you are ready to begin working in an ArcGIS Online Organization account.		

59	LEVEL & SET = = = = = = = = = =	ITEM DESCRIPTION =	EXAMPLE OR TASK =	DONE = = = = =
60	**LEVEL THREE: GEOANALYST**	**Grow existing skills toward professional level and add capacities by moving up into an ArcGIS Online Organization Account**		
61	**L-3, Set Eight: Expand the Basics**	**Get started with an ArcGIS Online Organization**	**See the example and do this task.**	**Got it? Check it!**
62		Establish an ArcGIS Online Organization subscription account. This should be done by an authorized representative of a school, typically a teacher working with a tech person or administrator. Advanced planning for use of the Organization is advised, including discussions of roles, security, and credits.	See http://www.esri.com/connected, and fill out the "Request School Account" form. After processing by Esri, instructions will be sent to the provided email address. While waiting, see AGO Orgs for Schools.	
63		Make sure the Organization is set up properly for use in school. Pay special attention to roles and privileges, the login process, and to sharing or not sharing outside the school. GeoMentors can help a lot in setting up the Organization properly.	Review the Org videos available. See also these sections in Help for ArcGIS Online: Activate subscription; Configure website; Invite users; Manage resources.	
64		Organizations operate similarly to a public account for building maps, but offer an additional rich set of premium data. Explore these extra layers, but know that viewers must be logged into an Organization to see any map saved using one of these layers.	Log in to the Organization, make a new map, choose Add/Browse Living Atlas, then click Show Esri Layers Only. See also the Browse Living Atlas Layers section of Help for ArcGIS Online.	
65		A key power of Organizations is publishing services. Published content can be shared with others for adding into many maps. Feature services can, if desired, be edited by users, allowing for selective or crowd-sourced data gathering. Feature services can be filtered to enhance analysis. Tile services offer fast drawing. Users can mix and match content in new and creative ways. This is an area where GeoMentors can help a lot, by optimizing, streamlining, and clarifying the process of publishing.	See About hosted features and tiles in Help for ArcGIS Online. Practice first with small data sets, like the earthquakes.csv and states.zip (from Level 2 Set Four).	
66		Use the Survey123 app, for smartphone and tablet, to gather field data, online and offline. Survey123 can only be used by someone logged into an Organization, and only to access maps with an editable feature service, where the map has been shared specifically with the individual or with a group of which the individual is a member. Survey123 allows entry even offline.	See Survey123 for ArcGIS and various movies in the Survey123 YouTube zone. Try a small test collection project, then a small test offline project, before diving into full usage. See also this blog.	

67	L-3, Set Nine: Expand the Analysis	ArcGIS Online Organizations bring the power of true geographic analysis to the web browser!	See the example and do this task.	Got it? Check it!
68		Many features would be much more useful with an additional field containing a calculation based on existing fields. Feature layers permit the layer owner to access the table, add fields, and fill the cells with calculated values.	See the overview in the Work with Fields section in Help for ArcGIS Online. See the blog on adding fields and calculations, then try with the state shapefile	
69		A number of powerful tools for geographic analysis are available for use in Organizations. The concepts and powers of each tool are carefully documented. Analysis requires publishing of features services to store results. Therefore analysis is available only to roles with publishing privileges.	See the overview in the Perform Analysis section in Help for ArcGIS Online. Pay special attention to the titles, graphics, and descriptions for the various tools. See Organization Roles in Help for ArcGIS Online. Work with Organization Admin to ensure that desired roles can publish.	
70		Each tool is part of a class of similar tools. If the tool names and associated icons are not sufficiently clear, help is available within the tools themselves to clarify the purpose and operation. The Help system also has more detailed guidance on each function.	See Use Analysis Tools in Help for ArcGIS Online. For additional guidance on a specific tool, see the class of tools within the Perform Analysis section in Help. For additional background on the nature of analysis, see the Analytics documentation and case studies in the ArcGIS for Desktop section of Help.	
71		Each tool panel involves a careful flow, identifying layer/s, function/s, parameter/s, and storage plans. At the bottom of each tool panel (shown here as item 5), there is a link to "Show credits." Analysis is a computational process, which consumes some of the Organization's credits. Processes done on small data sets tend to consume relatively few credits. Click the link to see the projected credit consumption. Careful planning of data, processes, and geographic extents will help minimize credit consumption.	See Work with a tool pane in Help for ArcGIS Online. For additional guidance on a specific tool, see the class of tools within the Perform Analysis section in Help.	

72		Sometimes, the data in the map are inadequate to answer a question. ArcGIS Online Organizations can enrich data layers with related content, using a growing storehouse of online data to add new attributes to features. This process also consumes credits, so plan carefully to minimize credit consumption.	See Data Enrichment in Help for ArcGIS Online. See also the Service Credits Overview for guidance about the credits consumed in enriching features.	
73	**L-3, Set Ten: Go Pro**	**ArcGIS Online is more than just browser-based maps and apps. This section will take significant time for investigation and mastery, and GeoMentors are extremely valuable to novice users here.**	**See the example and do this task.**	**Got it? Check it!**
74		Users of Microsoft Office for Windows 2010 or later have an extremely powerful add-in available: Maps for Office, which provides mapping in Excel and access to dynamic maps in PowerPoint. (ArcGIS Online Organization login required.)	See the quick Maps for Office intro video, then the Maps for Office detailed videos. See also the Maps for Office section of Help.	
75		ArcGIS for Desktop is a full-featured technology for analysis, cartography, and data generation. One tremendous power it offers is publishing content directly from ArcMap into ArcGIS Online, as feature or tile services. This is the best way to publish, if you want to pre-construct the classification and symbolization, use a specific map projection, or generate an editable feature service with highly constrained choices for attributes.	See ArcGIS for Desktop product page. See also the About hosted features and tile section of Help for ArcGIS Online. See also the blog+lesson about crowdsourcing fieldwork by publishing editable feature services.	
76		ArcGIS for Desktop can access most content on ArcGIS Online, and the extensive analytic powers in Desktop allow users to engage powerful analytics not available through just a lightweight browser. Working with Desktop takes time to master, but offers immense power.	Build background about ArcGIS for Desktop by viewing videos from the various Esri events, especially those showing and describing integration of tools in the ArcGIS platform.	

Level Three (Sets 8, 9, 10) take much more time and practice than the preceding sections, because there is much more capacity with an Organization account, especially when combining with the other tools of the ArcGIS platform. But just making it through Levels One and Two into Level Three is a demonstration of significant capacity for learning and doing GIS. At this point, you need to take advantage of the many resources for learning about GIS that go far beyond what this tutorial can include. See the full ArcGIS section of the Esri web.

For more information and guidance about using ArcGIS Online in education, see **Esri's K12 GIS portal on ArcGIS Online**.

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