

Lesson Plan 6-12 Grade – Introduction to ArcGIS Explorer

An ArcGIS Explorer Online Introduction to Remote Sensing

Image – an image is a *representation of reality*. It can be a sketch, a painting, a photograph, or some other graphic representation such as satellite data. Satellites capture and store electromagnetic waves that are reflected or emitted from features on the Earth, somewhat like a camera.

Remote Sensing – remote sensing can be defined as the scientific and technical discipline that involves acquiring information of various Earth features from a distance. Sometime the distance is great, such as satellite-based remote sensing where the satellites are in orbit high above the Earth; other times the distance is much less, such as aircraft-based remote sensing where the airplane is much closer to Earth.

Geographic Information System (GIS) – GIS can be defined as the technical discipline that uses computer-based (digital) geospatial data to map and model geographic information. Geographic Information Systems are composed of computer hardware, software, geospatial data (which we'll define shortly, so don't worry), and a person to operate the system.

Geospatial Data – data that has geographic location information associated with it.

Learning Objectives:

At the completion of this lesson students will be able to:

- Navigate around the world using ArcGIS Explorer Online
- Define Remote Sensing and GIS
- Create a pin on a location and provide details about that location

This exercise was created using ArcGIS Explorer Online. ArcGIS Explorer Online runs in a web browser, but you will be prompted to download and install “Silverlight Plug In,” in order to run ArcGIS Explorer Online.

Teacher Preparation: The preparation time will depend on the teacher's experience using ArcGIS Explorer Online. If the teacher has not used the program they should plan on one hour to become familiar with it, plus 30 to 45 minutes to install “Silverlight”(if not already installed on all the lab computers). If the teacher is already familiar with ArcGIS Explorer Online they will only need 30 to 45 minutes to make sure that each computer the students will be using has “Silverlight” installed and working properly.

Class Time Requirement: 45-60 min (depending on the ability of the students)

Materials needed: Windows or Mac computer with internet connection, a web browser, and “Silverlight” installed.



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Teacher Prep Instruction: Go to <http://explorer.arcgis.com> to familiarize yourself with ArcGIS Explorer. Download and install “Silverlight” onto all classroom computers. You will be prompted to do this when you enter the website, whether you are using Mac or Windows.

Classroom Instructions:

- 1) Start by opening the internet browser of your choice.
- 2) Once you are on the internet you will want to browse to <http://explorer.arcgis.com/>. This will take you to ArcGIS Explorer Online. When you arrive to the website you will see the world as a flat map.
- 3) First, familiarize yourselves with the toolbar shown below in figure 1.1. Your toolbar will look as follows.

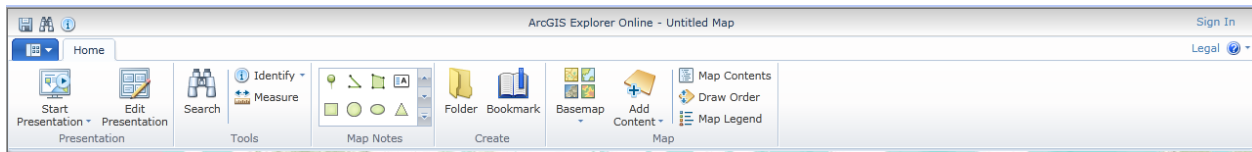
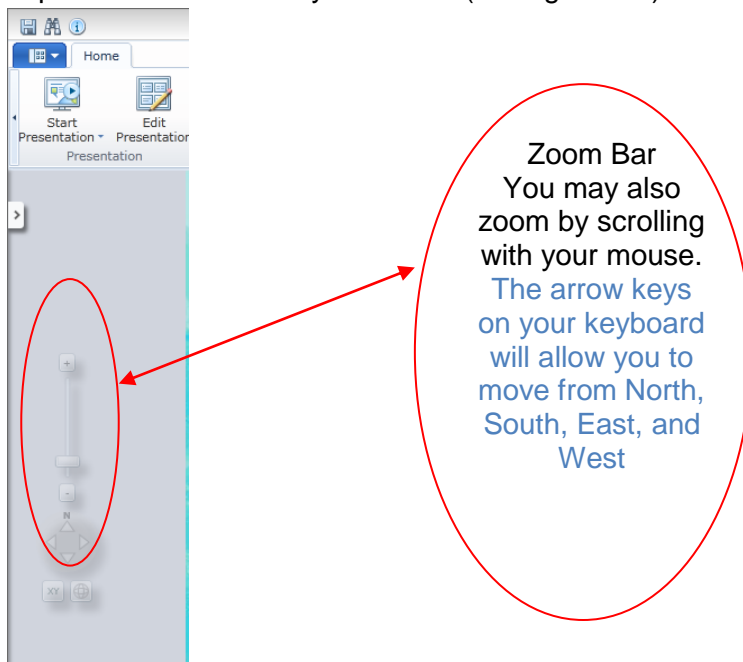


Figure 1.1 Toolbar Image

You will notice that many of the same tools that are on Google Earth are also located on this toolbar.

You will also notice that on the left hand side of the screen you will see your compass rose as well as your zoom. (see figure 1.2)



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Figure 1.2 Navigation



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- 4) On the left hand side of your screen you will see a small arrow. Click on that arrow and it will bring a search bar into view (see figure 1.3).

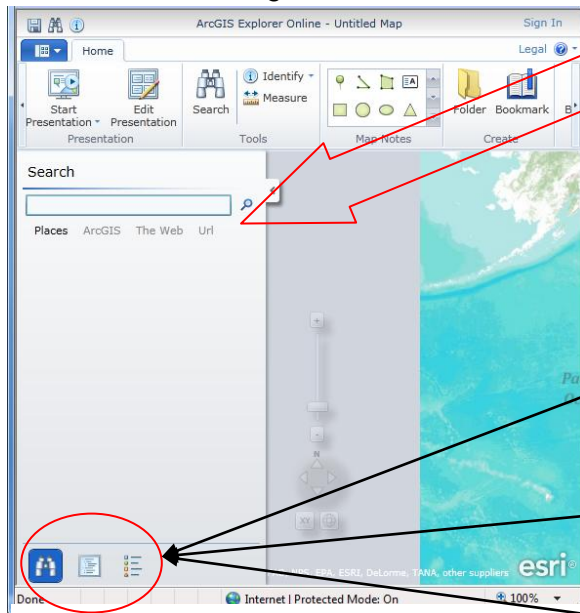


Figure 1.3 Search Bar

You will see multiple tabs below the search bar. Depending on what you are searching for, you may use different search criteria.

Also, at the bottom of the screen you will see binoculars, a paper, and a layers symbol.



The binoculars will allow you to search.



The paper will allow you to see the map contents.



The layer symbol will allow you to work with the layers shown on the map.

Now that we have looked at the basic steps in conducting a search it is time to practice!

- 5) In the search bar please type “Carnegie Science Center, Pittsburgh PA”. You will then fly to that location (see figure 1.4).

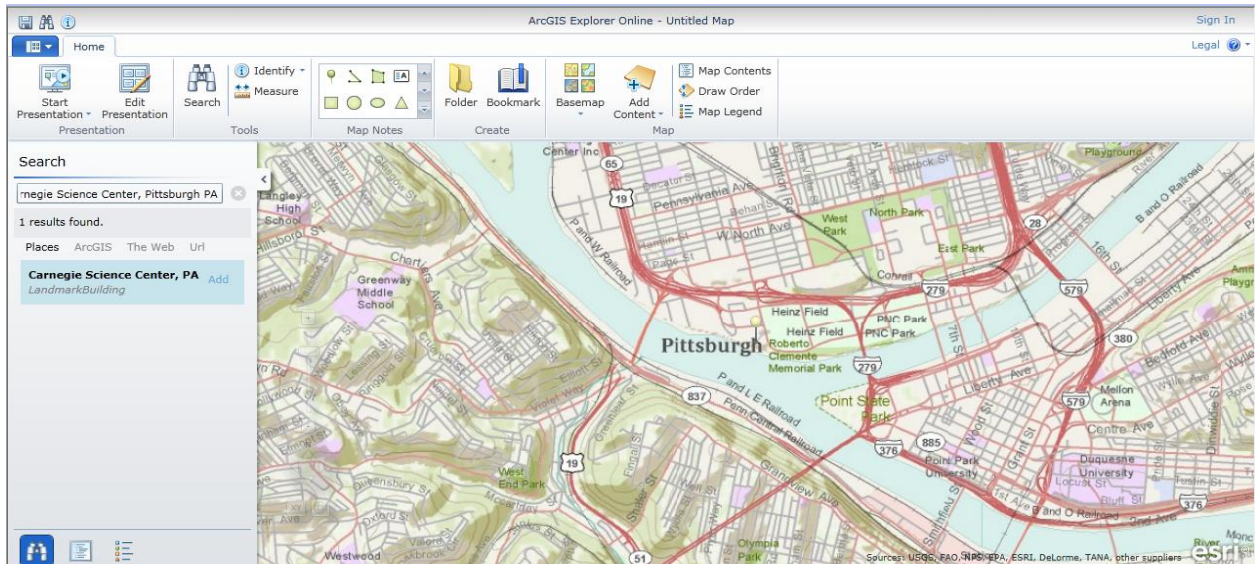


Figure 1.4 “Carnegie Science Center, Pittsburgh PA Search

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- 6) Once you have the location on your map you will notice that there is a yellow pin on the exact location. You have to finalize this location so it will stay on your map. Every time that you search a location a yellow pin will be at the location. It is not until you click “**Add**” that the pin will turn red. In order to finalize the location you will need to click the “Add” button next to “Carnegie Science Center, PA” in the search results (see figure 1.5 below).

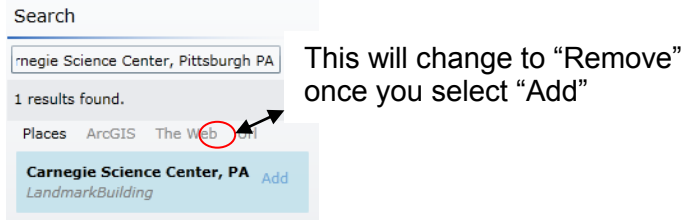


Figure 1.5 Add the location as a placemark

- 7) Next, click on the paper at the bottom of the search bar. You will notice that under “Map Content” Carnegie Science Center is listed. If you uncheck the box next to the name you will see that the red pin goes away (see figure 1.6).

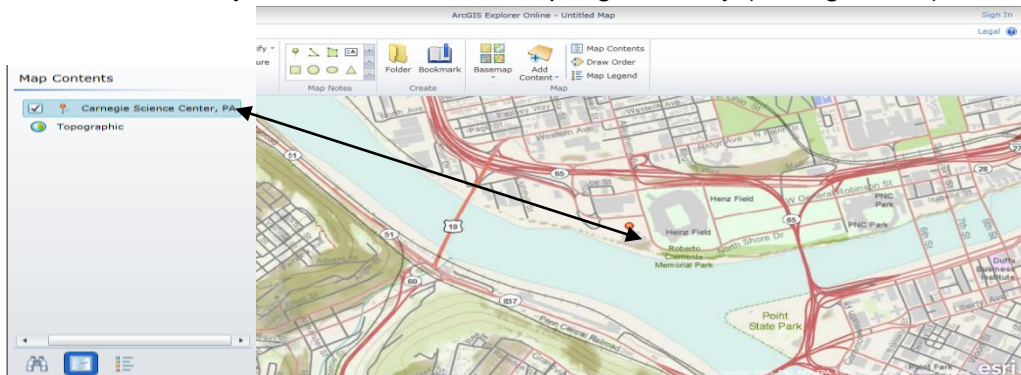


Figure 1.6 Map Contents vs. Image

The next step is to find out how to edit the information about our location.

- 8) Click on the red pin. A window will appear (see figure 1.7).



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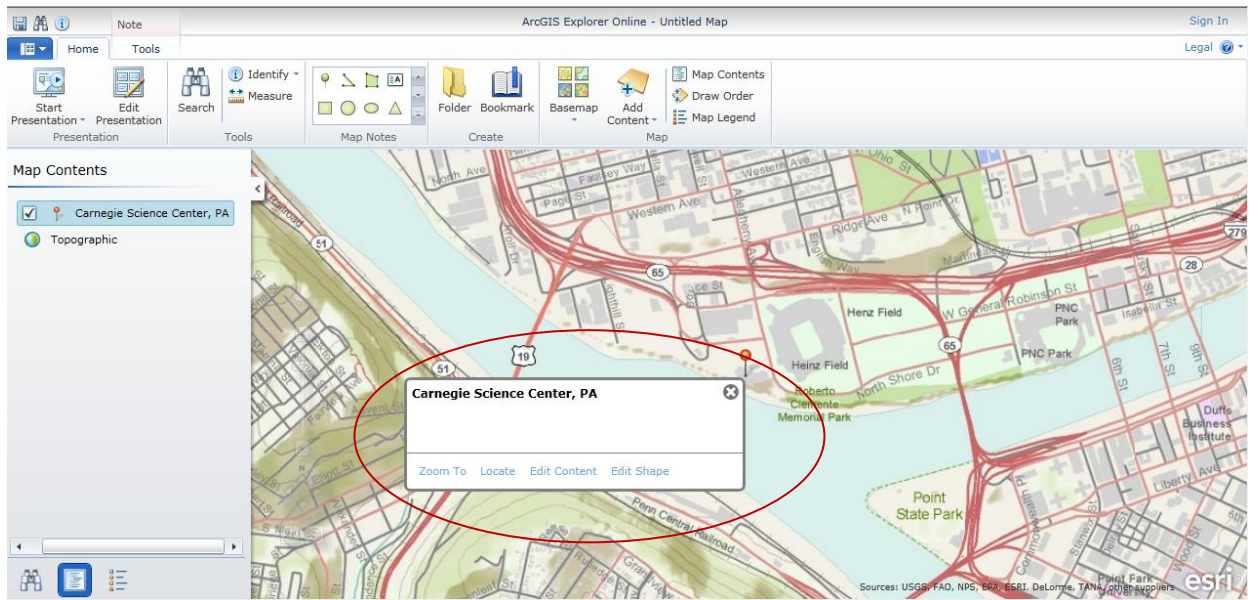
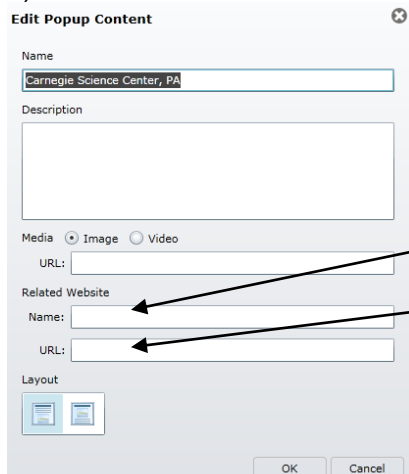


Figure 1.7 Adding a description to a location

9) Next click on the “Edit Content” tab, another window will appear (see figure 1.8).



In this box you can include a description of the location, picture, and a website.

Carnegie Science Center
www.carnegiesciencecenter.org

Figure 1.8 Edit Content Box

In the “Edit Content” Window, you can include a website for this location.



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10) In the toolbar you will notice an option that says “Basemap”. The basemap option is going to change the type of map that is displayed (see figure 1.9). For example, click on the “Basemap” and change it to “US Topo Maps”(see figure 1.10 and figure 1.11).

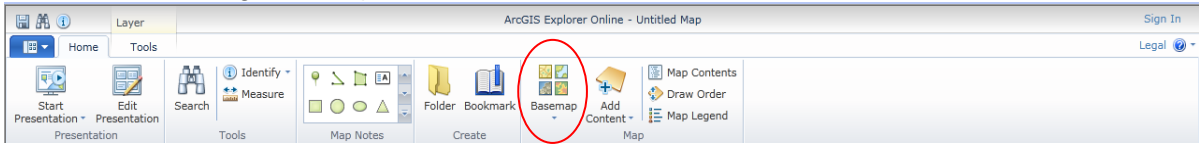


Figure 1.9 Ribbon showing basemap location

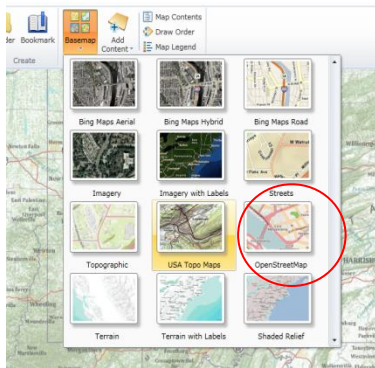


Figure 1.10 USA Topo Maps

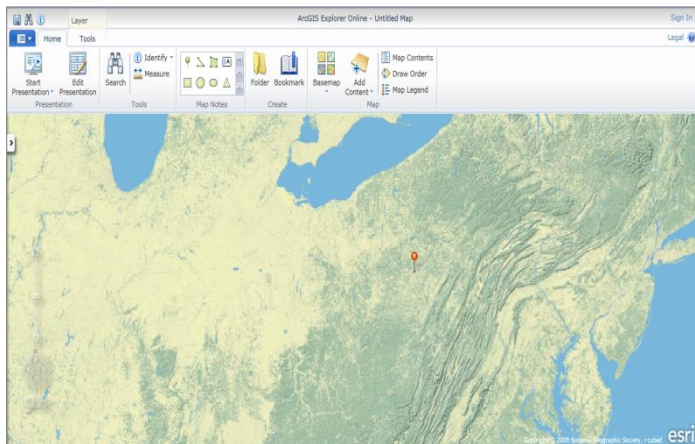


Figure 1.11 USA Topo Map with location



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Notice that the look of your map has now changed. You may need to zoom out.

Next, practice time!

- A) Start with the basemap of “Bings Map Hybrid” (Carnegie Science Center should still be placemarked)
- B) Then go to the search bar and input your home address. Ex: 250 University Ave California, PA 15419 (Make sure that you have “places”selected)
- C) Next, add your house to the map.
 - If you would like you may add a description to your house location
- D) Go to the ribbon and select the “measurement” tool.
 - Change the length to miles.
- E) Measure the distance from the Carnegie Science Center to your house.
 - To measure, click on one location with your mouse then drag until you reach the next location, then double click. This will give you the measurement for the distance.

Once you have drawn your distance line your distance will be shown in the measurement window.

