

Using the Geographic Inquiry Process to Understand Your Environment

V.2 - May 2017



Assignment Overview

In this assignment, you will follow the geographic inquiry process to study the environment in your local community. You will use your smartphone and GIS tools available in ArcGIS Online to explore, analyze and act on your results.

The following tutorials should be referenced to help you complete the assignment:

- Collector for ArcGIS: 45 – 60 minutes <http://bit.ly/2rAXzKt>
- Video: Creating and Saving Features in ArcGIS Online: 5 minutes <http://bit.ly/2rjB8ss>
- Introduction to ArcGIS Online: 20 – 30 minutes <http://bit.ly/2n1AeMm>
- Using Tables and Filters in ArcGIS Online: 10 – 15 minutes <http://bit.ly/2nw1DqD>
- Measuring Features in ArcGIS Online: 20 – 30 minutes <http://bit.ly/2o815KJ>
- Symbology (Extension Exercise only): 20 – 30 minutes <http://bit.ly/2r7AYns>
- Geoprocessing (Extension Exercise only): 60 minutes <http://bit.ly/2rjySkW>

Assignment Tasks

Collecting and Mapping your Data

Asking a spatial question and collecting data to answer your question are two of the steps in the Geographic Inquiry Process. Collecting your own data to be used in a mapping software application, such as ArcGIS Online, is an important skill since you may not always be able to find suitable data to analyze. In this part of the assignment, you will define a spatial question, create a Web map, and collect your own data in the field using the Collector for ArcGIS app.

Q1 Define one or a set of spatial question(s) about an area of interest in your local community. For example, why are the stream levels low for this time of the season? What is the depth, width and flow of the stream at certain control points and what could be the cause of low water levels? Or, where would be the best place to plant a vegetable garden in my backyard considering the type of soil, the soil pH levels, the amount of sunlight and the amount of rain?

Q2 Write a paragraph explaining why you chose this spatial question for the assignment.

1. Create a **feature layer** with all the fields needed to answer your spatial question. Ensure to enable layer to be taken offline and to enable attachments.

Tutorial: Collector for ArcGIS (Part A: Create and Configure a Feature Layer)

2. Create a **Web map** with your feature layer. Configure the symbology and pop-ups as desired. **Save** and **share** the web map publicly and to a Group so that users of the Collector for ArcGIS app can find it.

Tutorial: Collector for ArcGIS (Part B: Publish and Share)

3. Determine an appropriate number of sample points within your study area where you will collect data. It is important to have a suitable sample size in order to answer your spatial question. Next, go out to your study area and collect data at those sample points. Take a **picture** using your smartphone at each sample point and attach the photo to your collected point.

Tutorial: Collector for ArcGIS (Part C: Using Collector for ArcGIS App)

Q3 Write a paragraph explaining why you chose these sample points in your study area. Include justification for the number of sample points you chose.

Exploring your Data in ArcGIS Online (What is where?)

In this part of the assignment, you will use your ArcGIS Online Organization account to explore the data you collected.



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1. **Sign in** to your *ArcGIS Online Organization* account.
2. **Open** your Web map used to collect your data and change the **basemap** if necessary.
3. Examine your data by **panning** around your map, and **zooming** in and out.
4. Click on the individual **features** and familiarize yourself with their **attribute** information.
5. Using **Map Notes**, add natural and/or constructed features to your Web map that help answer your spatial question. For example trees, rivers, railways, bridges, structures, etc. Create separate **Map Notes** for each group of *feature*.
6. Add **attribute data** (e.g. Name, Description, Images) to your features.
7. Search for relevant **data** in *ArcGIS Online* and add it to your Web map. For example, demographics, soil type, elevation, etc.

Hint: In the Search for Layer dialogue, change the option to search within *ArcGIS Online* (as opposed to *My Organization*).

Q4 Record the data layer names you added to your Web map. Write a half page summary explaining why you chose those data layers and how they will help answer your spatial question.

Analyzing your Data in ArcGIS Online

Analyzing your data using queries/expressions and measuring between features is another step in the Geographic Inquiry process. In this part of the assignment, you will create expressions using table filters and create buffers to analyze your data.

1. Using the **Filter** function, create multiple expressions to help answer your spatial question. For example, if the pH level of soil for vegetables must be within a certain range to grow, create an expression like '**Soil pH is between 6.0 and 6.8**'.

Tutorial: Using Tables and Filters in ArcGIS Online

Q5 Record the expressions you created and explain why you chose these expressions.

2. Using the **measure** tool, determine the distance of your natural/constructed features to your control points. Ensure that your control points are an appropriate distance from the features. For example, your vegetable garden must be a certain distance from trees in your backyard to gain maximum sunlight.

Tutorial: Measuring Features in ArcGIS Online

Q6 Record the distance(s) you chose. Write a half page summary analyzing your results.

3. **Save** your Web map.

Acting on your Findings (Why is this important?)

In this part of the assignment, you will finalize your analysis by creating a web app, recording your conclusions, and proposing a decision in writing based on your findings.

1. Finalize the layout of your web map (e.g. data layer names, symbology, pop-up configuration, etc).
2. **Share** your map with *Everyone (public)* or *Members of a group* you belong to.
3. Click the **Make a Web Application** button.
 - a. Select **Publish** under the *Basic Viewer* application template and then **Publish**.
 - b. Enter an appropriate *Title*, *Tags* and a *Summary*.
 - c. Click the **Save & Publish**.
 - d. **Configure** your web app as desired.



Using the Geographic Inquiry Process to Understand Your Environment

Q7 Review your map and write a paragraph to answer your initial spatial question.

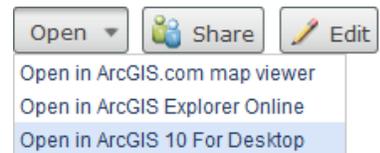
Q8 Write a paragraph to suggest how you could act on your findings and make a difference through social media, a letter or email to relevant decision makers, or informing your parents.

Bonus Exercise

In the extension exercise, you will open your Web map in ArcGIS for Desktop 10.x and perform additional analysis on your data.

1. Open your Web map in ArcGIS for Desktop 10.x.

- Click the **My Content**  button.
- Click the link for your **Web map** to *view the item details*.
- Click the **Open** button under your *Web map's* thumbnail select **Open in ArcGIS 10 For Desktop**.
- Click **OK** on the *Opening item.pkinfo* window to open *Web map* in *ArcGIS For Desktop 10.x*.
- When prompted, **sign in** to your *ArcGIS Online* Organization account.



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2. Before you can perform analysis on your data, export the features to shapefiles.

- Right-click** the feature, point to *Data* and select **Export Data**.
- Click the **Browse** icon and navigate to a location on your computer.
- Click the **New Folder** icon and name your folder *Data*.
- Click the **folder** icon next to *Data* once, type an appropriate name in the *Name* box and ensure the save type is shapefile. Click **Save**.

3. **Symbolize** your features.

Tutorial: Symbology

4. Create **buffers** around your features.

Tutorial: Geoprocessing (Part C)

5. **Save** your ArcMap document.

Q9 Write a paragraph explaining the additional benefits to analyzing your Web map in ArcGIS for Desktop

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