**Activity 1.1: Getting to Know Google Earth**

This activity will help you develop the basic skill set you will need to navigate the Google Earth application, which you will use throughout the rest of this course as you ask and answer scientific questions.

**Learning Objectives**

* Become familiar with Google Earth: Learn to find geographic coordinates for a specific location, create place markers, measure distances, and make elevation profiles.
* Learn how plate tectonics and continental topography/ocean bathymetry relate

**Deliverables (marked with an arrow)**

* **Push a .pdf document to the GitHub repository as your submission.** Create a Word doc with the required answers and images, and then save it as a PDF. Your PDF will include responses to Questions 1-5 and images from Part 3b and Part 5. The file name should be in the format Lastname\_First&MiddleInitials\_1-1.pdf. For example, Marie Curie would title this assignment as: Curie\_MS\_1-1.pdf. Please ask your instructor if you need assistance creating a document and/or PDF.

**Part 1: Download Google Earth**

If Google Earth is not already available on the computer you are using, go to [http://www.google.](http://www.google.com/earth/index.html) [com/earth/index.html](http://www.google.com/earth/index.html). The instructions for this lab and the help websites below all refer to the desktop version of Google Earth, not the version within the Chrome browser.

1. Click on “Older Versions” at the top of the page for the desktop version of Google Earth (Pro).
2. Click on “Download” in the middle left of the page.
3. Open the .exe file (pkg installer for Mac) to install and launch Google Earth.

**Part 2: Familiarize yourself with Google Earth**

1. Go to <http://serc.carleton.edu/NAGTWorkshops/teaching_methods/google_earth/UserGuide.html> and skim the webpage to familiarize yourself with the Google Earth interface and its functions. Pay particular attention to the figures, so you begin to understand the different icons and panes. You do not need to read the section “Creating Image Overlays” or the content thereafter.
2. Once you have completed the reading, go to <http://serc.carleton.edu/files/sp/library/google_earth/examples/google-earth-tip-sheet.v2.pdf> and save or print the tip sheet.
3. Using the tip sheet as your guide, try out the different functions in Google Earth. For example, try searching for a specific place, navigating to it, and zooming into and out of the area. Try measuring the distance between features and adding a Placemark to one of them.

**Part 3: Complete the following questions and activities**

You should create a Word document into which you can type answers to these questions as well as paste images. You will need to save this document in .pdf format and upload it to GitHub when you are finished. Follow the file naming instructions given above.

**Part 3a: Use Google Earth to collect basic facts about your personal geography**

1. Create a Placemark at your home

* 1. “Fly to” your home or residence by typing the address in the box in the Search Pane.
  2. Follow the directions in the Guide ‘Creating a New Placemark’. Make sure to save the resulting file using directions in ‘Working with Places’.

**🡪 Question 1: What are the latitude, longitude, and elevation of your home?**

**Tip 1:** This is a science course, so you need to use metric units. Switch the units to metric by going to Tools>Options>3D view tab>Units of Measure>select ‘Meters, kilometers’. Mac users: Google Earth>Preferences.

**Tip 2:** Latitude and Longitude are given in a variety of different formats depending on the context. The default for Google Earth is Degrees Minutes Seconds. This is fine for this activity but be aware that different datasets we use in this course might use different formats, requiring either conversion or changing the settings in Google Earth.

**Part 3b: Use Google Earth to create an elevation profile**

This course will require you to become comfortable travelling between dimensions. No, not the ‘dimensions’ of science fiction, but the three dimensions of **space** and one dimension of **time.** For now, we are going to transform the bird’s eye view of Google Earth into a horizontal **elevation profile** to explore how **topography** (e.g. the ups and downs of the Earth’s surface) reflects features and processes on the Earth’s surface.

1. Create an elevation profile across Davidson County, Tennessee.
2. To make an elevation profile across Davidson County, ‘Add Path’ (check User Guide if you are not sure how) and draw a line from NORTH to SOUTH that runs roughly through Nashville from Ridgetop to Brentwood. Give it a name before you click OK. (Tip 3: Make sure that “Borders and Labels” is checked on Layers)
3. Under ‘Places’, right-click on the name of the cross-section you just made and select ‘Show Elevation Profile’.
4. Save an image of the map and profile and paste it into your document. To do this, click on **File** → **Save** → **Save Image**

🡪**Save your Elevation Profile across Davidson County and include it in your submission.**

🡪**Question 2: What is the lowest elevation shown on your cross-section through Davidson County? What prominent local feature does this elevation minimum correspond to?**

Now, we will look at plate boundaries in Google Earth to explore plate tectonics using a dataset created by the United States Geological Survey designed to work with Google Earth.

**Part 4: Download Tectonic Plate Boundaries KMZ Layer**

Go to the USGS earthquake database: <http://earthquake.usgs.gov/learn/kml.php> and click on ‘Tectonic Plate Boundaries.’ Download the KMZ file; by clicking on the downloaded file it should open up automatically in your Google Earth application.

**Part 5: Use Google Earth to Explore Plate Boundaries**

1. Using your new ‘Earth’s Plate Tectonics’ layer, find an ocean-continental convergent, an ocean-ocean convergent, and a divergent boundary.

🡪**Question 3: For each of your plate boundaries, what are the names of the tectonic plates on either side?** (Be sure to specify the boundary type (e.g. “divergent”) in your answers)

2. Find the tectonic boundary closest to Nashville, TN

(**hint**: Use the ruler tool at the top menu bar to help you figure out which boundary is closest)

🡪**Question 4: How far from Nashville is it and where is it located relative to Nashville?**

🡪**Question 5: What are the names of the plates associated with this boundary and what type of plate boundary is it?**

**🡪Create an elevation profile of this boundary and label the parts of it. Your profile should be along a line that is perpendicular to the boundary. Your labels should include the plate boundary location, the plate boundary type, the plate names on both sides, and any other features associated with that type of plate boundary. Include this labelled profile in your assignment.**

**Tip:** When creating an elevation profile of the seafloor, click Add > Path, click the start and end points, then in the dialog box select the “Altitude” tab, select “Clamped to sea floor” in the drop-down menu, and then click OK.