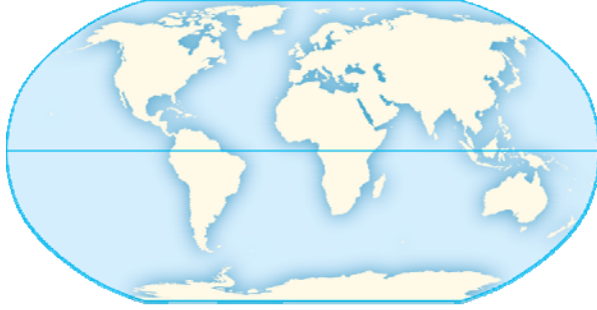


Encounter Human Geography



Name: _____

Date: _____

Chapter 1: Introduction to Google Earth™

This chapter will introduce you to Google Earth™. Google Earth™ is a computer application that provides opportunities to see the Earth's varied geography from a range of aerial and street-level perspectives. You can zoom in and out, rotate, and tilt your perspective of the Earth. You will learn how to navigate to different locations and use some of the tools that this powerful application provides. Note: Google Earth™ is an application that is updated frequently. As a result, the functions and appearance of the application may vary slightly from what is described below.

To begin, verify that your computer has the latest version of Google Earth™ installed. If you do not, then go to <http://earth.google.com> and download the most recent version of the free Google Earth™ software. Your computer will need a high-speed internet connection in order to utilize the application effectively.

The very best way to learn Google Earth™ is to dive in and explore your world. The software is intuitive to use and not complicated. However, you will also find it useful to learn some of the basics of navigation as demonstrated in the Google Earth™ User Guide. Go to <http://earth.google.com/support> and then click the link for "User Guide." Do not forget about this useful resource. If you are ever confused or need help with using the software, this will be your best bet for quick and easy assistance.

In the User Guide, under the "Getting started" heading, there is a link titled "Getting around." Open this link and study the "Getting to Know Google Earth™" diagram and associated information. Be sure to click the links associated with the tools to explore the capabilities of Google Earth™. Without studying the aforementioned pages of the User Guide, you will be unable to answer the following questions and will likely encounter significant difficulties in your attempts to complete the explorations of Encounter Human Geography.

Download [EncounterHG_ch01_Intro.kmz](#) from www.mygeoscienceplace.com and open in Google Earth™.

Exploration 1.1: Getting Started

1. If you needed to find a specific place on Earth, you would use the
 - A. Places panel.
 - B. Layers panel.
 - C. Overview map.
 - D. Finder tool.
 - E. Search panel.**
2. The on-screen navigation controls for Google Earth™ are located on what part of the Google Earth™ window?
 - A. bottom right
 - B. top right**
 - C. center
 - D. bottom left
 - E. top left
3. Which of the following is not a capability of Google Earth™?
 - A. You can display sunlight across the landscape.
 - B. You can add polygons, lines, and points (placemarks) to the view.
 - C. You can view live imagery.**
 - D. You can display historical imagery.
 - E. You can email views from Google Earth™.
4. Where would you find the information regarding a view's coordinates, elevation, and imagery date?
 - A. In the Places panel
 - B. In the Search panel
 - C. In the Layers panel
 - D. At the bottom of the 3D Viewer**
 - E. In the Overview map

In the User Guide, click the “Navigating in Google Earth™” link, located under the “Getting around” heading. Play the short video to learn how to navigate the globe in Google Earth™. Scroll down the page and review other tips for navigating in Google Earth™. Be sure your computer's sound is turned on.

5. If you wanted to look around from one vantage point, as if you were turning your head, you would use the
 - A. on-screen look joystick.**
 - B. arrows on your keyboard.
 - C. on-screen move joystick.
 - D. wheel on your mouse.
 - E. on-screen zoom slide.

A helpful feature of Google Earth™ is the Overview Map. This shows where you are on the globe when you are zoomed in closely to the Earth. Click the link to “Using the Overview Map” in the “Getting around” section of the User Guide.

6. Identify the statement regarding the Overview Map that is supported by the information contained in the User Guide.
 - A. The zoom ratio of the Overview Map cannot be adjusted.
 - B. The Overview Map window responds to adjustments made in the 3D Viewer.
 - C. The Overview Map is always shown in Google Earth™
 - D. The Overview Map is intended to show areas at a larger scale than the 3D Viewer.
 - E. The size of the Overview Map is larger than the 3D Viewer.

Click the “Five Cool, Easy Things You Can Do in Google Earth™ ” link, located under the “Getting around” heading. Number one on the list explains how to enter the location of your school in the Search panel and then view the image of your school. Do this now.

Exploration 1.1: SHORT ESSAY

1. Seeing your school from an aerial perspective, describe some insight that you have gained. Did you find out there were buildings you did not know existed? Maybe there is a parking lot that is closer to your dorm than the one you currently use? Feel free to be creative in your response.

As I look at my campus, I am pleased to see that virtually all of the parking is isolated to the periphery of the campus. This makes the campus experience much more oriented to the pedestrian. The elongated nature of the campus helps facilitate this layout. Because the campus is generally less than one-half mile wide, commuters can usually park within one-quarter to one-half mile of their destination. I also noticed that there are more large trees on campus than in the surrounding residential and commercial districts. I am glad to know that my university is contributing positively to the community in terms of urban forestry.

One can navigate in Google Earth™ using either on-screen controls, the mouse, the keyboard, or any combination of these approaches. To see what keyboard commands perform what tasks, click the “Navigating with the keyboard” link in the “Getting around” section of the User Guide. Note that the keystrokes differ for a Mac and a PC.

2. Navigate using both the on-screen controls such as the zoom slide and move joystick; then navigate using the keyboard and/or mouse. Try integrating the two approaches. Which method(s) do you prefer and why?

I have a strong preference for navigating using the mouse. I like to adjust location and zoom with the mouse. Sometimes I feel that it is easier to adjust the tilt using the on-screen displays. Another reason I prefer to use the mouse is that it allows me to hide the on-screen navigation controls in order to have a less-cluttered 3D viewer. This can be accomplished by clicking View, Show Navigation and selecting the controls that you want to be visible.

Exploration 1.2: Layers

Google Earth's™ functionality is magnified by the ability to add layers of data and information to the 3D Viewer. Beyond the visual representation of the Earth's surface we can add any number of features such as the road networks, place names, boundaries, photographs, business locations, current weather conditions, and three-dimensional buildings to name just a few. A problem that faces many users of Google Earth™, however, is that their viewers become cluttered with too much information. In general, it is best practice to simply display only the layers you need at any given time. *Borders and Labels* is the layer that you will find most useful without cluttering the view.

Open Google Earth™ and begin by going to the Layer pane and turning off all of the layers. This can be done with a single click by un-checking the box next to *Primary Database*.

Open the *1. Introduction to Google Earth™* folder that is loaded in the *Temporary Places* folder in the Places pane. You can right-click on the *Introduction to Google Earth™* folder and you will see an option to "Save to My Places." Select this and the folder will be moved to your *My Places* folder. This way you will not have to reload it next time you start Google Earth™.

By clicking the plus sign next to the *1. Introduction to Google Earth™* folder, you will expand the folder and see what's inside. You will see a series of five folders. Expand the *1.2 Layers* folder and then double-click the *Albuquerque, NM* placemark. Now check the boxes beside the ten or so layers and/or folders in the *Primary Database* in the Layers pane beneath the Places pane. Wait a few moments and you will get a taste of how cluttered Google Earth™ can become. It will take several moments for everything to load. Now turn off all of the layers/folders except the folder called *Borders and Labels*. Depending on the type of question you seek to answer, you may want to activate one or several folders or layers at a time.

For example, let's start with the *Photos* layer. Turn this layer of information on by clicking the box next to *Photos* in the *Primary Database*. You will see a number of small blue and red squares appear on the screen. Begin clicking the blue squares and you will see that these are photographs of features that are correlated with their location on the ground. Click on approximately ten of these boxes contained in the current view. Now click one of the red squares to see 360-degree views that are available. When these images are activated, you can click the photograph to fly into the image. Click "Exit Photo" in the upper-right corner to return to the 3D Viewer. Return to the original perspective by double-clicking the *Albuquerque, NM* placemark.

Turn off all of the layers except the *Roads* layer. You will see that the major highways of the community are illuminated and labeled. This *Roads* layer can be very helpful when you are attempting to analyze patterns on the landscape, as transportation is closely related with many types of development. Now use the zoom-slider or the scroll wheel on your mouse to slowly zoom in. As you zoom in, you will notice that more and more details of the road network will emerge until the smallest residential streets appear and are labeled. Zoom out and these features and labels disappear.

Exploration 1.2 MULTIPLE CHOICE

1. The name of the street that is immediately north of the *Albuquerque, NM* placemark is
 - A. Indian School Rd.
 - B. Interstate 40.
 - C. State Highway 47.
 - D. Richmond Dr.
 - E. Euclid Ave. NE.

Turn off the *Roads* layer. Double-click the *Downtown* placemark in the Places pane to zoom to a view of downtown Albuquerque. Perhaps you can get a sense that this is the central business district by the relatively larger buildings. Maybe you noticed the shadows in the image suggesting some of these buildings had considerable vertical development. It would be helpful if we had more information that could be added to the map to help us understand the physical realities of downtown. Turn on the *3D Buildings* folder and wait a moment for the data to load. You can click on individual 3D models that have been built to gain additional information. Now you have a much better feel for what the downtown area really looks like.

This added information is what geographic information systems (GIS) are all about. We can take layers such as a road network and do analysis in relation to the built environment. Throughout this text you will be capitalizing on the ability of Google Earth™ to display and overlay different types of data and information on the surface of the digital globe in order to increase your understanding of the world and human geography.

2. What is the name of the tallest building in downtown Albuquerque?
 - A. New Mexico Bank and Trust
 - B. Albuquerque Convention Center
 - C. Commerce Bank of Albuquerque
 - D. Albuquerque Plaza Office Tower/Bank of Albuquerque
 - E. Albuquerque Petroleum Building

Turn off the *3D Buildings* folder. Street-view imagery is increasingly available in urban locations around the world. This tool can really do a great job of providing you with a sense of place of a particular location as you can simulate driving down a road by clicking on successive camera icons. From the perspective of the *Downtown* placemark, locate Central Avenue near the yellow push-pin for downtown. Continue to zoom in toward the street near the placemark until the screen switches to Street-view. Work your way down Central Avenue to the 300 block address range. You can advance down the street by clicking on the yellow line or using your mouse's scroll wheel. The address is shown in the upper right corner of the screen. There is a bar and grill with a unique sign in the aforementioned address range.

3. The bar and grill that is located in the 300 block of Central Avenue has a unique sign that identifies it as the
- A. Library Bar and Grill.
 - B. Eagle and Child Bar and Grill.
 - C. Ritz Bar and Grill.
 - D. Long Bar and Grill.
 - E. Celtic Bar and Grill.

Click “Exit Street View” in the upper-right corner when you have completed your street-viewing. Turn on and double-click the *US Drought 04/09/11* folder to see an illustration of the application of areal data to Google Earth™. This shows drought conditions on April 09, 2011. Here it would be helpful to know what states are affected, so let’s turn on the *Borders and Labels* folder. Sometimes it’s advantageous to make a data layer somewhat transparent. At the bottom of the Places pane you will see a slider that will allow you to adjust the transparency of an overlay. Practice manipulating the transparency before returning the slider to the maximum coverage (slid to the right).

4. The USDA drought imagery illustrates that drought conditions were consistently most severe in early April of 2011 in
- A. Minnesota.
 - B. the Pacific Northwest.
 - C. an area from Maine to New York.
 - D. south Texas.
 - E. the Dakotas.

Turn off the *US Drought 04/09/11* folder. In the *Primary Database*, expand the *Weather* folder. Turn on the *Clouds* layer and explore the coverage of this data layer and then turn on the *Radar* layer. You will see that these layers do not have the same coverage. While cloud imagery is available globally, the radar data is only available for select locations like North America and Western Europe. This data is one of the rare occasions in Google Earth™ where you are viewing near-live data. When you have completed your exploration of clouds and precipitation, turn off and collapse the *Weather* folder.

There are dozens of additional datasets, multimedia files, and links to outside resources in Google Earth™. For a taste, expand the *Gallery* folder in the *Primary Database*. Turn on the *NASA* folder and then navigate to southern Ethiopia. Click on the NASA icon and explore the NASA content that is available for this location.

5. What statement best describes the NASA data available associated with the NASA icon positioned over southern Ethiopia?
- A. Volcanic activity that is ongoing in the region.
 - B. Effects of Saharan dust storms on Ethiopia’s cities.
 - C. Imagery of vegetation deviation from normal.
 - D. Pollution from industrial fires.
 - E. Copper mining impacts on the landscape.

Exploration 1.2 SHORT ESSAY

1. Based solely on what you can ascertain from your sampling of Panoramio photographs, write a short paragraph that describes the community of Albuquerque, New Mexico.

I have a strong preference for navigating using the mouse. I like to adjust location and zoom with the mouse. Sometimes I feel that it is easier to adjust the tilt using the on-screen displays. Another reason I prefer to use the mouse is that it allows me to hide the on-screen navigation controls in order to have a less-cluttered 3D viewer. This can be accomplished by clicking View, Show Navigation and selecting the controls that you want to be visible.

2. Describe the clouds and precipitation patterns over North America using the Radar data from Google Earth™. Is there a strong correlation between cloud cover and precipitation? Can you identify a storm system(s) (area(s) of low pressure)? In other words, does it look like it could be raining in or near your area right now? How can you tell? Document the date and time you viewed these features in your response.

As of 3 PM CDT April 24, 2011, the dominant pattern is that the western US is almost entirely clear of precipitation and cloud cover. The exceptions are found in some of the higher mountains in the Cascades and Rockies. One can see the major low pressure system that impacted much of the south central US in recent days, making its way into the upper Midwest. The clouds are tightly wound-up into the low and there are a number of showers and thunderstorms associated with this cloud cover.

Exploration 1.3: Human-Environment Geography Elements

Let's continue to build our familiarity with Google Earth™ and its tools by exploring a few locations that introduce some of the topics of human geography. As you complete the explorations, you will find that these topical areas overlap and intertwine with great regularity. Although our focus is on the human elements of geography, the physical landscape is usually a significant component of our studies. In fact, Google Earth™ is a terrific tool to visualize Earth's complex physical landscapes. The three-dimensional capacity of the program allows the user to get a grasp on the variations in relief that a paper-map is not able to provide. In the *Primary Database*, verify that all layers are turned off.

Open the "Google Earth Options" dialog box by selecting "Tools," and then "Options" from the menu bar. On the "3D View" tab, verify that elevation is displayed using "Meters, Kilometers" and click "OK." Open the *1.3 Human Geography Elements* folder and double-click the *Grand Canyon* placemark. You will zoom to a view of this unique natural feature. As you move the cursor across the screen you will see the values for elevation that are displayed at the bottom of the screen change.

Exploration 1.3: MULTIPLE CHOICE

1. What is the approximate elevation value of the Colorado River in the vicinity of the *Grand Canyon* placemark?

- A. 725 meters above sea level
- B. 1145 meters above sea level
- C. 1550 meters above sea level
- D. 2375 meters above sea level
- E. 6335 meters above sea level

Turn on the *Deepwater Horizon* placemark and then double-click it to fly to the location. This is the site of the 2010 oil spill that occurred after a deep-sea drilling rig experienced a total failure. Let's use the measure tool (the button containing a ruler icon at the top of the screen) to determine the distance between the site of the accident and the nearest shoreline. Click the Ruler tool and then position the cursor over the *Deepwater Horizon* placemark. Click once and then move the cursor over the nearest land (the end of the Mississippi River delta) and click again. Be sure you have changed the units to kilometers using the drop-down menu associated with Length in the Ruler tool.

2. What is the approximate straight-line distance between the *Deepwater Horizon* site and the nearest land?

- A. 20 kilometers
- B. 50 kilometers
- C. 80 kilometers
- D. 120 kilometers
- E. 175 kilometers

An important part of monitoring the spill in the days, weeks, and months after the event was the application of satellite imagery. Turn on the *2010-05-17 MODIS* folder and zoom to an appropriate level to view the extent of the spill.

3. At the time the *2010-05-17 MODIS* image was captured, the oil spill extended farthest from the *Deepwater Horizon* site in the

- A. western direction.
- B. northern direction.
- C. eastern and northern directions.
- D. northern and western directions.
- E. southern and eastern directions.

Now turn on and double-click the *New Orleans, LA and Suburbs Flood Zones* layer. This map has been used as a guide for residents of New Orleans who decided to rebuild following Hurricane Katrina. Notice the slider at the bottom of the Places pane. You can use this to make the active layer (the one that is highlighted in the Places pane) more or less transparent. Experiment with the slider now.

4. The area of New Orleans that is generally lowest in elevation is
- the Algiers neighborhood, south of the Mississippi River.
 - the area south and east of the Lakefront Airport.
 - downtown.
 - the area due east of Louis Armstrong International Airport.
 - the Elmwood neighborhood, north of the Mississippi River.

Exploration 1.3 SHORT ESSAY

1. Based on what you have seen regarding the Deepwater Horizon oil spill and the rebuilding of New Orleans, identify and describe two ways Google Earth™ can be applied as a beneficial tool in times of crisis.

Google Earth™ represents a tool that can help in times of crisis in numerous ways. Two that stand out include increased public awareness and improved spatial analysis and decision-making. Increased public awareness is gained by the easily accessed platform of Google Earth™. Millions of people utilize the application on a daily basis. When layers of contemporary relevance, such as the impacts of Hurricane Katrina or the Deepwater Horizon spill are added to the application, users are likely to explore and gain knowledge on the topic. Secondly, when varied layers such as population locations, flood maps, and viable transportation routes are added to Google Earth™, a range of disaster management specialist can access the information to make informed decisions.

One extremely useful capability of Google Earth™ is the ability to view historical imagery for many locations on Earth. This allows one to document change over time. Double-click the *Japan Tsunami* placemark. You will see one small area that was devastated by the tsunami that occurred following an earthquake on March 11, 2011. You will notice that a time slider has appeared in the upper-left corner of the 3D Viewer. This can be turned on and off by clicking the historical imagery tool. It has a picture of a clock with an arrow pointing in the counter-clockwise position. With the historical imagery turned on, click the rewind button on the far left of the slider to step back one image set at a time. You can cycle back until you see pre-tsunami imagery. When you have completed the following question, be sure to turn off the historical imagery.

2. What is the most recent date that pre-tsunami imagery is available for this location? Describe some of the changes you can see in the setting from the time of the tsunami up to the most recent imagery.

Imagery from 8/13/2009 is the last set available prior to the tsunami. It's interesting to see the progression from the massive flooding that occurred, along with some fires, and the associated destruction on the day of and immediately following the event to the most recent imagery. One can see that much of the debris has already been cleared and the former roads have been mostly cleared. It appears some buildings are also being repaired.

Exploration 1.4: Human Geography Elements

Let's take a look at a sample of population data displayed in Google Earth™. Double-click and turn on the *Life Expectancy Birth* folder. The height and color of the country polygons correlate to the life expectancy values. The countries that are more extruded (taller/higher) have values

that are higher. Colors are ramped to illustrate locations at the top and the bottom of the scale. You can click on the flag of a country to see its value, as well as the highest and lowest value in the dataset. Turn off the *Life Expectancy Birth* folder when you complete the following question.

1. Which of the following countries has the lowest life expectancy at birth?
 - A. Afghanistan
 - B. Japan
 - C. Laos
 - D. United States
 - E. Zambia

Our sampling of human phenomenon continues by double-clicking and turning on the *USA Religious Adherents* layer. Counties are enumerated according to the percentage of persons per county that adhere to a religious body. Assess the map for patterns. Turn off the *USA Religious Adherents* layer when you complete the following question.

2. Which of the following statements is not supported by the *USA Religious Adherents* layer?
 - A. Utah has one of the highest state rates of religious adherence.
 - B. Oregon displays one of the highest levels of religious adherence.
 - C. The east and west coasts generally have lower levels of adherence than the interior of the US.
 - D. Religious adherence in the Great Plains is generally higher than in the Rocky Mountains.
 - E. The map suggests that Illinois is more religious than Indiana.

Now view the popular culture location associated with the *Cultural Icon* placemark. Double-click this placemark. Study the site and the surrounding area and use clues provided by other layers you can turn on in the *Primary Database*. When you complete the following question, turn off any layers that you have turned on in the *Primary Database*.

3. The site associated with the cultural icon placemark is
 - A. Las Vegas.
 - B. the Mall of America.
 - C. Disneyland.
 - D. the state capital of Arizona.
 - E. the Neverland Valley Ranch.

Within the aforementioned cultural icon site, there is at least one building that could be identified by many people around the world. The built environment can provide us with buildings that reflect both folk and popular culture and the values of a local society in general. The next folder, *Unusual Buildings*, contains a fun collection of interesting structures from around the world. Click on the placemarks in the map or in the Places pane to see pictures of these structures.

4. In what state is found a unique building that suggests fishing is a significant part of the local culture? Remember you can turn on the Borders and Labels layer to see the states labeled.
 - A. California
 - B. Georgia
 - C. Maryland
 - D. New York
 - E. Wisconsin

Exploration 1.4: SHORT ESSAY

1. How does your perception of the site associated with the *Cultural Icon* placemark change after viewing it from this perspective? For example, is it bigger or smaller than you expected? Were you surprised by the surrounding landscape?

I must admit I was surprised to see that Disneyland was quite a bit smaller than I anticipated. The Magic Kingdom complex, including Disneyworld alone is significantly more expansive. It doesn't appear that Disneyland has much room to grow as it is hemmed in by freeways, residential neighborhoods, and large commercial developments.

Turn on and double-click the *AirTraffic 3D* folder. This is a neat application that tracks airline flights in central Europe in real time. Observe the screen for a few minutes and note any patterns you see with trajectory and altitude of planes.

2. What kind of information can you obtain from the *AirTraffic3D*? What real-world benefits could this or similar tools that have been created for Google Earth™ provide?

AirTraffic 3D allows you to see the current location, speed, trajectory, and elevation of aircraft in a portion of Central Europe centered on Switzerland. If you allow the application to run for several minutes, you can also determine what planes are ascending or descending. If you were to monitor the screen for a period of hours and days, you would be able to determine some general temporal and spatial patterns of air traffic in this part of the world. A more detailed version of this application could, in theory, be utilized as a sort of back-up air traffic control visualization. One could also evaluate the use of air corridors in Europe to determine if the most efficient and safe routes were being utilized.

