

# Google Earth:

## A Virtual Globe for Elementary Geography

Judy Britt and Gus LaFontaine

**Originally called Earth Viewer** in 2004, Google Earth was the first virtual globe easily available to the ordinary user of the Internet.<sup>1</sup> Google Earth, at [earth.google.com](http://earth.google.com), is a free, 3-dimensional computer model of Earth, but that means more than just a large collection of pretty pictures. It allows the viewer to “fly” anywhere on Earth “to view satellite imagery, maps, terrain, 3-D buildings, and even explore galaxies. You can explore rich geographical content, save your toured places and share them with others.”

The webpage “Google Earth for Educators” suggests that teachers first practice moving freely around in the virtual environment by changing the viewing angle and position of the globe with a click of the mouse.<sup>2</sup> These views may show geographical or man-made features.

### A Virtual Globe

The purpose of this article is to demonstrate that Google Earth can be used to teach fundamental skills of geography in the elementary classroom. We are a teacher-professor team. As a university supervisor for social studies methods, Judy Britt encountered Gus’s use of Google Earth in his first grade classroom at Kirksville Elementary in Richmond, Kentucky. His applied examples were the inspiration for developing additional ideas for using this virtual globe. Our two-part article begins with a standards-based geography unit, “Learning About Landforms with Google Earth,” in which students also learn about and practice skills for reading maps and globes. In the second part, we examine useful strategies for integrating Google Earth with inquiry, hands-on learning, and reading tradebooks in elementary classrooms.

### Learning About Landforms

(Gus LaFontaine speaking.) As I developed this four-day geography unit, I wanted to give students an opportunity to explore geography skills and learn vocabulary—all the while incorporating local, state, regional, and country maps. I planned activities for my students to learn about geography tools during an introduction to basic map reading skills and landforms. To meet my goal of giving the students real-life connections and a rich experience in geography, I incorporated

Google Earth into the development of this unit. In this lesson plan outline, I use Google Earth, along with other forms of media, to deliver social studies instruction for my students.

My objective was for students to be able to use Google Earth to

- Understand that a globe is a model of the Earth.
- Locate and describe familiar places at school and the community.
- Locate continents and countries in the world.
- Locate places, landforms and bodies of water using absolute and relative location.
- Identify landforms and major bodies of water.

As I prepared these lessons, I referred to Madison County Curriculum guidelines and Kentucky Core Content 4.1 standards.<sup>3</sup> I believe that teaching children to use different kinds of maps, to apply geographic skills, to form mental maps, and to analyze geographic information can be accomplished with instructional activities that make learning meaningful.

### Day One: Our School

In the first lesson, I introduced students to basic map skills and vocabulary. Following the class discussion, I led the class on a tour of the school campus using a map of the school that I had drawn on paper with a pencil, photocopied, and distributed to each child. Each map included a set of directions for skills and vocabulary we discussed earlier in the lesson.

Students enjoyed this real-life application of a map showing a familiar terrain. As we walked about on this pleasant September day, I encourage the students to notice details of the school building and the grounds. “What color is the roof of the building? Where is the playground? Where do you get on and off the school bus?” “And now where is that spot on the map?” To engage the students in map construction, I asked, “Would you be able to draw a map that shows even more elements of the school grounds?”

Back in the classroom, I modeled, with a marker on the front board, how to draw a map of the school by hand. Then I used a computer presentation station (which places a large image on a wall or screen) to call up Google Earth and show Kirksville



Amazon



Kenya



Kentucky



New England

Elementary School. Using the “fly to” search feature, I simply typed the address of the school in the search box. Reviewing questions from our earlier discussion, I pointed out features from the Google Earth map of the school and grounds that we had seen on our walk around campus.

### Day Two: Local Landmarks

To connect to prior knowledge we reviewed information from the previous day’s lesson. Using the computer presentation station and Google Earth, I displayed a street map of Richmond. Using our vocabulary words, I modeled for them how to give directions. For example, “At Main St. turn west. When you get to 1st St. turn north. Follow it until you get to Vine St. and turn right.” Then I showed the students how to use their vocabulary words in writing directions from Kirksville to a local restaurant we had visited during a recent field trip.

### Days Three and Four: Landforms Around the World

For days three and four, I taught landforms by integrating technology and hands-on activities. I combined Google Earth

with Google Images, and online videos to “visit” landforms around the world. For example, I showed students maps (at various magnifications), photographs (from the ground and from satellite), and moving pictures of each landform and waterway that we studied. These geographic features included the African plains, the Amazon River, oceans by the coast of Honduras, mountains of Colorado, the Sahara Desert, lakes of New England, and our own rolling hills of Kentucky. For each “visit” I used the videos and the virtual globe to explore the landforms and regions. After we “arrived,” I led a discussion during which I taught students how to make observations about each region of the Earth and feature of geography. To culminate the lesson, I divided the students into groups to use Play-Doh to create models of the landforms we had just observed and discussed.

### Day Five: Assessment

Prior to the unit “Learning Landforms with Google Earth,” I administered a paper-and-pencil pre-assessment from which it was clear that students’ knowledge of landforms was limited. At the con-



clusion of the unit of study, I used Google Earth to test the students' knowledge of major landforms. For this assessment, each child was given a handout with a list of landforms. I used the search feature ("Fly To...") on Google Earth to create the assessment. Once we were at a destination I asked the students to identify the landform from a list of multiple choices. My students understood the questions easily and displayed confidence as they studied the questions and found the answers.

### Five Themes

(Judy Britt speaking) Gus's landform unit fostered meaningful learning and assessment in a real world context. Innovative teachers like Gus LaFontaine are finding creative ways to achieve state and national standards in the K-6 curriculum. Lesson plans that integrate Google Earth can provide experiences that engage children in a deeper understanding of their place in the world. Using the "five themes of geography" from 1987, we offer some additional ideas for using Google Earth.<sup>4</sup>

**Location:** The geographic theme of location is implemented with the Google Earth search box feature. In addition to typing names of places, Latitude and longitude coordinates can be typed in the search box. In a computer lab setting students practice using Google Earth when they type exact coordinates for major cities and locate the places on the map.

**Place:** Google Earth's search feature gives students the capability to "fly to" the places or landforms to explore the physical and human characteristics. The Sightseeing folder on Google Earth has a great collection of famous places in the world. Select play tour from the Tools menu to see an example of files that are ready to be shared.

**Region:** Google Earth provides a real world look at the physical regions on earth (grasslands, deserts, rain forests, mountains, polar regions). Engaging students in inquiry helps them to make connections between the physical and human characteristics of a region. Collections of places can be saved with placemarks. The saved collections called KML resource files can be saved as KMZ files to be e-mailed and shared with others.

**Movement:** Teaching the geographic theme of movement involves instructional activities that engage elementary students with seeing how people, goods, services and ideas move from place to place on earth. Using the roads layer, teachers can demonstrate to the students how people move based on the geography. Beginning with local areas, teachers engage the students in inquiry to learn how we are connected to and dependent upon other people in the world.


**Human-Environment Interaction:** With Google Earth students explore the environment by looking at both natural features, such as vegetation, soil, and climate, and human features, such as buildings, roads, and other things people have made. As younger students become aware of the relationship between people and the environment, inquiry lessons engage them with a consideration of the effects—positive and negative—that occur when people interact with their surroundings.

### Developing Spatial Knowledge

Technological developments such as geographic information systems (GIS) and Google Earth have contributed to the need for spatial thinking and teaching in social studies education. Spatial thinking is the foundation for skills in map reading and interpretation.<sup>5</sup> The first Essential Element of the 18 Geography Standards (from 1994) defines the world in spatial terms.<sup>6</sup> The geographically informed citizen knows and understands:

- How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information.
- How to use mental maps to organize information about people, places, and environments.
- How to analyze the spatial organization of people, places, and environments on Earth's surface.

Gus's unit of study, Learning About Landforms with Google Earth, provides a good example of how instruction is vital to the development of spatial thinking in elementary education. Gus began his instruction with concrete objects. His introduction to mapping began with a hand-held map on paper and a walk around the school campus. He led class discussions to encourage the children to think about where things were located on the school grounds. Students applied their spatial understanding to draw maps of the school grounds. His lesson culminated with use of the virtual globe to show the students how the school and its surrounds look on Google Earth.

Google Earth is also a powerful, flexible tool for teachable moments. With a classroom presentation station, it could be used quickly to provide context for information from books and newspapers, making real world connections to geography lessons. (SIDEBARS on page 23) 

### Notes

1. [www.google.com/corporate/history.html](http://www.google.com/corporate/history.html)
2. Google Earth for Educators [www.google.com/educators/p\\_earth.html](http://www.google.com/educators/p_earth.html).
3. Madison County Curriculum Maps: Madison County Schools; available from [www.madison.kyschools.us/dist](http://www.madison.kyschools.us/dist).
4. Developed by the National Council for Geographic Education (NCGE) and Association for American Geographers (AAG) in 1984, "the five themes of geography" provided a simple structure for different elements of geography education. While the original book is no longer in print, the National Geographic Society (NGS) provides a detailed look at the themes and suggests activities for incorporating them into teaching at [www.nationalgeographic.com/resources/ngo/education/themes.html](http://www.nationalgeographic.com/resources/ngo/education/themes.html). See also note 6 below.
5. Sarah Bednarz, Acheson Witham, and Robert S Bednarz, "Maps and Map Learning in Social Studies," *Social Education* 70, no. 7 (November/December 2006): 398-404.
6. Today, the National Geography Standards define what a geographically informed person should know and understand. The standards are online at [www.ncge.org/publications/tutorial/standards](http://www.ncge.org/publications/tutorial/standards) and published in *Geography for Life: National Geography Standards* by the Geography Education Standards Project (Washington, DC: National Geographic Society, 1994).

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## Children's Literature

With the current emphasis on literacy, children's literature has become a powerful way to integrate the curriculum in the elementary classroom. Google Earth is a tool for connecting literature from a geographic perspective. Integrating sources of literature with Google Earth is based upon the simple notion that stories have settings that can be traced to a place. Literature is routinely used to integrate the social studies with languages. Two examples of literature that could enrich a unit of study on geography are *Me on the Map* and *Geography A-Z*.

*Me on the Map* by Joan Sweeney is typically used to engage students in an exploration of maps. Access to Google Earth extends this tradebook lesson beyond the pages of a book. When different map locations are found on Google Earth, students can see "my town, my state, my country and my world." Building on ideas developed from a review of Gus's geography unit, a teacher could also engage students in using Google Earth at a learning center to locate places in the local community.

*Geography from A to Z: A Picture Glossary* by Jack Knowlton is a perfect backdrop for a Google Earth lesson that makes a real world connection to a geography vocabulary. Using the conventional globe as a guide, students learn to recognize landforms. With the virtual globe, students learn to recognize the features of satellite imagery to see islands, volcanoes, forests, deserts and bodies of water. Landform investigations could be extended in a computer lab plan with hands-on practice to locate famous landforms on earth.

The classic scavenger hunt lesson becomes a an exciting computer lab activity when students are engaged in "flying" to Google Earth locations based upon clues. *Flat Stanley*, a character from a 1964 book was updated to a project in 1995 when it was used to teach children about traveling and letter writing. With Google Earth, this project receives 21st-century update when Flat Stanley becomes a customized placemark on Google Earth.

### References

- Sweeney, Joan. *Me on the Map*. New York: Crown, 1996.  
Knowlton, Jack. *Geography from A to Z: Picture Glossary*. New York : Crowell, 1988.  
Brown, Jeff. *Flat Stanley*. New York: Harper & Row, 1964. The online effort is called The Flat Stanley Project, [www.flatstanleyproject.com/](http://www.flatstanleyproject.com/)

## Additional Resources on the Internet

Lesson plan websites provide additional opportunities for adapting lessons for Google Earth.

Geography Skills and Your Town, [www.nationalgeographic.com/xpeditions/lessons/18/gk2/geoskills.html#adaptions](http://www.nationalgeographic.com/xpeditions/lessons/18/gk2/geoskills.html#adaptions). Students use the five themes of geography to explore their town as they learn about towns across the United States. Adding Google Earth to this K-2 lesson plan from National Geographic provides a real world aspect that makes it meaningful and fun.

Mission Geography: USA, [www.nationalgeographic.com/xpeditions/lessons/matrix.html](http://www.nationalgeographic.com/xpeditions/lessons/matrix.html). Students in grades 3-5 are engaged in a research project to learn about the culture, history and geography of the US regions.<sup>12</sup> Since this lesson plan already includes websites for research, adding Google Earth as one of the resources adds layers of learning to the lesson plan. In the lesson, students develop a "travel plan" to visit states in certain regions by highlighting places and characteristics that unify the region. During class presentations students use Google Earth to highlight states in their region.

Google Earth for educators, [www.google.com/educators/p\\_earth.html](http://www.google.com/educators/p_earth.html), has quick tips for getting started as well as ideas for using it in the classroom.

A Google Earth Blog, [gearthblog.com/basics.html](http://gearthblog.com/basics.html), includes a comprehensive set of links for the novice or the more experience user.

**GELessons.com** was created by teachers to enhance instruction using Google Earth.

Jerome Burg has an interesting project that uses literature with Google Earth. His website, [www.googlelitrips.com](http://www.googlelitrips.com), has an outstanding collection of journeys that provide meaningful context for children's literature. Read more about Google Teachers at [www.google.com/educators/gtc.html](http://www.google.com/educators/gtc.html).

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