



Bringing the World into your Classroom Fall Science Update – fall 2011



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(a digital version of this handout is available at ????)

1. What is Google Earth?

Google earth is fundamentally a Geographic Information System (GIS). A GIS is a digital map combined with a database similar to an excel spreadsheet. The maps and data in Google Earth encompass the world and can be updated in real time by people all over the globe. Much of the topographic data which can be used to view places in 3D and create landscape profiles was acquired in year 2000 by a space shuttle mission call the [Shuttle Radar Tomography Mission \(SRTM\)](#).

2. Getting around the Globe with Google Earth

Navigating around the globe is best experienced using a two-button mouse with a scroll button. Zooming and moving are similar to the movement you would accomplish with a real globe and your hand. Details on navigation are provided by Google at <http://earth.google.com/support/bin/static.py?page=guide.cs&guide=22358&topic=22361>. You can access the entire on-line user's guide [here](#).

3. Pushpins and Scavenger Hunts

If you find locations that you want to use for activities you can save them using [pushpins](#) and either share them with the world or perhaps upload them to your own web site. Pushpins can be a great way of creating a scavenger hunt for students to explore some aspect of the earth. Pushpins can contain links to web pages, links to videos, or links to photos which you have uploaded to a photo sharing site such as [Panoramio](#). The resolution of digital cameras is increasing to the point where many of these photos can be used to [describe plants, animals, or rocks](#).

4. Some cools layers that are included

[Recent Earthquakes](#) – Curious about what is shaking around the globe? You can see recent earthquakes, their depth, and magnitude in real time.

[Volcanoes](#) – You can explore the globe and see where the volcanoes are located and in many cases pull up links that tell more about the specific volcanoes.

[Youtube](#) – Many videos are now linked to Google Earth so if you are trying to share with students about a particular geographic region or culture there may be video you can find based in their geographic location.

[Gigapan Photos](#) – These high resolution photos take you “on the ground at many locations”. Some are high enough resolution that you can identify people walking around on the ground.

[Wikilocs](#) – “Discover outdoor trails from all over the World, explore the paths on 3D terrain, download tracks for your GPS, enjoy the landscapes you'll see on the route by watching at the photos and Youtube videos taken along the trail by wikiloc.com users and pictures from Panoramio.”

5. Travels through space and time

Not only can you virtually travel around the globe to places unimaginable just 10 years ago. With the latest versions of Google Earth you can actually travel through time! Starting in version 5.0 Google Earth allows you to [view historical aerial photos](#) of an area. This allows us to see what a location looked like in the past so we can use Google Earth to evaluate changes to the landscape over time. For example measuring glacier retreat or river migration.

6. Other Planets!

You can explore the [night sky, the moon, and Mars within Google Earth](#). The moon is interesting in that you can visit the places visited by the NASA Apollo landing missions. I have used the images of Mars several times to explore the evidence for [water on Mars](#).

7. Street View and Taking Virtual Walks

In many locations you can view street level photos of the places in the map (called [Street Level View](#) in Google Earth). This is accomplished with an army of Global Positioning System equipped trucks with 360 digital photo capture rigs mounted on the top. There are some locations where these photos capture interesting geological formations or perhaps other features you may want to explore with students.

8. Putting Google Earth into your Presentations

In PowerPoint 2010 you can insert a window into the world that you can navigate within your PowerPoint presentation. This is done with an add-in called live web for PowerPoint. You can learn more about how to do this [here](#). This is handy if you want to show the students some diagram or feature while illustrating it at a geographic location.

9. Measurements and data collecting in Google

Measurements and landscape analysis can be done in Google earth to collect data to explore many aspects of the globe. For example the sinuosity of rivers, the retreat rate of glaciers, the shape of volcanoes, and many others. [Elevation profiles](#) can also be created explore the shape of mountains and other features.

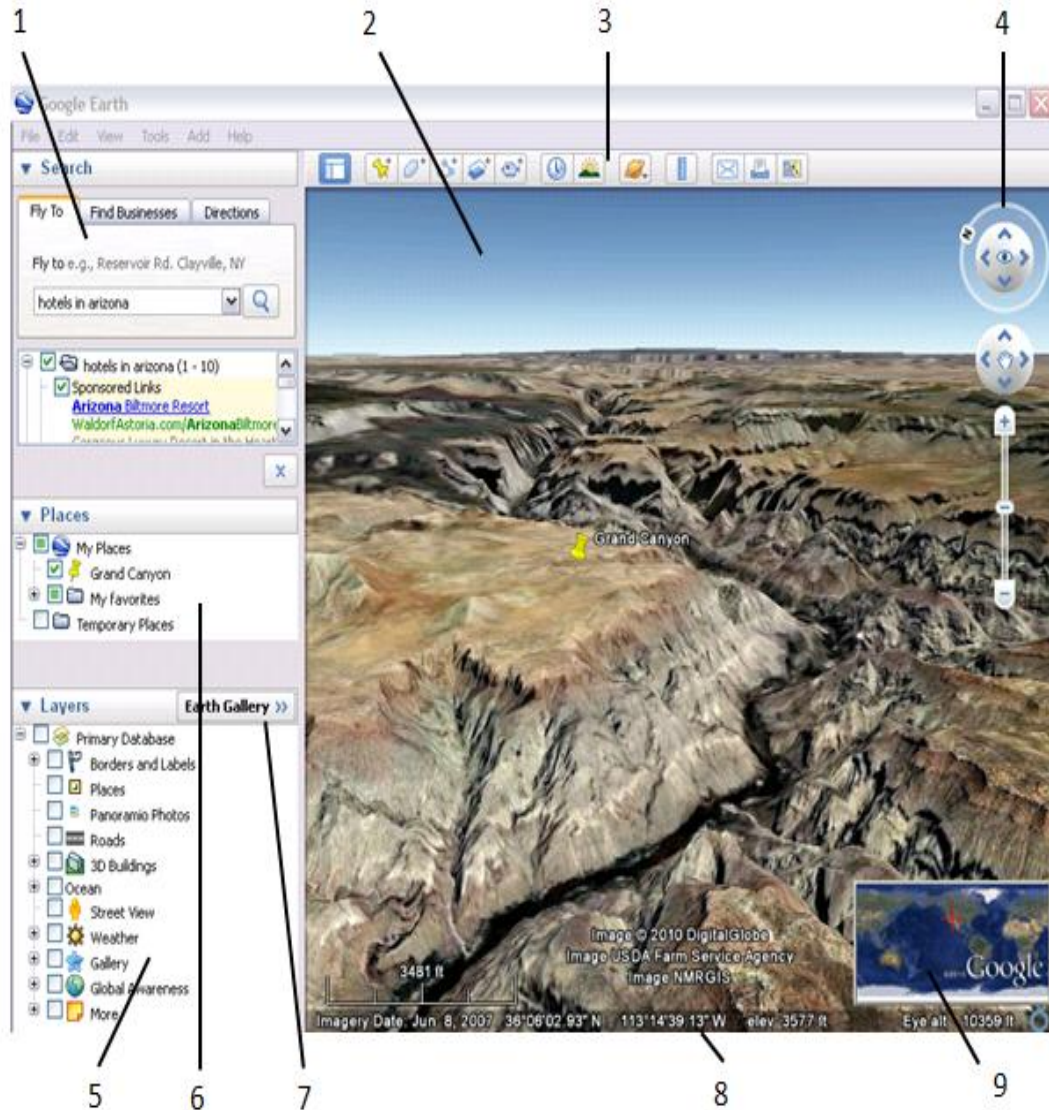
Web sites with information or activities to use with Google Earth:

- [Google Earth for Educators](#) – “This site is brought to you by Google and made especially for Google Earth educators and students”
- [Google Earth Lesson Plans](#) – “An Educational Resource for Teachers”
- [Google Earth Classroom Activities compiled by Google](#) – “From search games to presentations on how to use Docs & Spreadsheets with your students, here you can find real-world examples of innovative ways that teachers and librarians are using Google tools to help students learn.”
- [Google Earth educators discussion group](#) – “...We encourage you to use this space to start discussions with fellow teachers. Talk about anything you'd like. Share ideas about innovation in education; ask questions about where to find teaching resources; tell your colleagues about curricula you've created that have worked really well.”
- [Teaching with Google Earth](#) – A great resource put together by Glenn A. Richard, Mineral Physics Institute, Stony Brook University, and hosted by [SERC](#) at Carleton College with a number of links and activities to explore.
- [Google Earth for Educators: 50 Exciting Ideas for the Classroom](#) – an excellent compilation of activities organized by grade level and topics.
- [Using Google Earth blog](#) – “Learn tricks and tips to explore your world more effectively in Google Earth.”
- [Time Magazine’s Top ten Google Earth Finds](#) – “Columbus and Magellan had it rough. Exploration these days is quite literally an armchair activity, as high-resolution satellite images and tools like Google Earth make it possible for anyone with an Internet connection to pore over the globe with a fine-toothed comb. There are entire online communities devoted to finding and cataloging the most unusual locales worldwide, creating 21st century atlases of minutiae. It isn't just for hobbyists, either — Google Earth has helped scientists find previously unknown ruins and police locate clandestine marijuana fields. Here are 10 of the most unusual discoveries.”
- [PC magazine’s 20 Google Tips and Tricks](#) – “Here are Google's top shortcuts for getting the most out of Google Search as well as Google Maps and Google Earth”
- [Google Earth Showcase](#) – “From discovering shipwrecks in the ocean to zooming into 3D cities around the world, you can explore an expansive library of tours, videos, and imagery that have been created by Google Earth and supporting partners.”

The Google Earth Layout

(Content is from the Help site at <http://earth.google.com/support/bin/static.py?page=guide.cs&guide=22358&topic=22361>)

The following diagram describes some of the features available in the main window of Google Earth:



1. **Search panel** - Use this to [find places and directions](#) and [manage search results](#). [Google Earth EC](#) may display additional tabs here.
2. **3D Viewer** - View the globe and its terrain in this window.
3. **Toolbar buttons** - [See 'Using the Navigation Controls'](#).
4. **Navigation controls** - Use these to zoom, look and move around ([see below](#)).
5. **Layers panel** - [Use this to display points of interest](#).
6. **Places panel** - Use this to [locate, save, organize and revisit placemarks](#).
7. **Earth Gallery** - Click this to import exciting content from the [Earth Gallery](#)
8. **Status bar** - View coordinate, elevation, imagery date and streaming status here.
9. **Overview map** - Use this for an [additional perspective](#) of the Earth.