

## Earth's Dynamic Geosphere: Plate Tectonics Activity 1 - Taking a Ride on a Lithospheric Plate

### This investigation will help you to:

- Investigate - Part A: Data from the Global Positioning System
- Investigate - Part B: Data from a Computer Model
- Understanding and Applying What You Have Learned
- Inquiring Further
- Learn more about The Interior Structure of the Earth
- Learn more about Measuring Plate Motions with GPS
- Learn more about Sea-floor Spreading

#### Investigate - Part A: Data from the Global Positioning System

Obtain a GPS time series for a station nearest you. Record the directions and rates of motion in cm/yr for the station nearest your community.

- Explore a map that plots GPS station positions. Click on station plots for more detailed maps that show station positions as a function of time.

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#### Investigate - Part B: Data from a Computer Model

You will need to know the latitude and longitude of your school in decimal format. Find your school (or another familiar place) on your local topographic map. Use the map to identify the latitude and longitude of your school.

- Courtesy of the Microsoft Corporation, 57,000 U.S. Geological Survey topographic maps were digitized and are now available on the Web.
- Find topographic maps by place name, latitude and longitude, or UTM coordinates under the Get A Map section. Allows you to download topographic maps (including USGS maps) for free, at various scales (from 1:100,000 to 1:24,000).
- Visit the Relative Plate Motion Calculator.

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#### Understanding and Applying What You Have Learned

Examine the scale of the USGS topographic map of your community.

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### Inquiring Further

1. Excellent web sites that describe how GPS works can be found on the EarthComm web site.  
Very comprehensive site explores scientific methods before and after the advent of GPS, as well as a review of how GPS works and what are its applications. A good introductory site.

This site reviews the basics of plate motions and introduces the science of geodesy and using GPS to track current plate movements. Includes an image of a GPS satellite.

2. Visit the EarthComm web site for the address of animated images of the motions of lithospheric plates. Allows you to view plate motions from the past 200 million years, as well as predicted motions 25 million years into the future.

Information on plate tectonics, including animations of plate motions for the past 750 million years.

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### Learn more about the The Interior Structure of the Earth:

"The Interior of the Earth" by E.C. Roberston, USGS

Information about the make up of the crust, the mantle, and the core, and how each was "discovered" and studied.

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### Learn more about Measuring Plate Motions with GPS:

"GPS: A New Constellation" - Smithsonian Institution National Air and Space Museum exhibition

Very comprehensive site explores scientific methods before and after the advent of GPS, as well as a review of how GPS works and what are its applications. A good introductory site.

"Understanding Plate Motions" - from *This Dynamic Planet*, USGS

This site reviews the basics of plate motions and introduces the science of geodesy and using GPS to track current plate movements. Includes an image of a GPS satellite.

"Tectonic Plate Motion" - Space Geodesy, NASA

UNAVCO - Visit the Relative Plate Motion Calculator

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### Learn more about Sea-floor Spreading

Plate Tectonics in a Nutshell - USGS Cascades Volcano Observatory

Reviews the basics of plate tectonics including taking a look at sea-floor spreading. Includes several maps which highlight the "ring."

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