GEOSTAC Teaching Guide

Lesson Developer: Jane Benjamin, Lynn Songer
Title: Tectonic and Landforms
Subject Area: Geography
Grade Level: High School AP Geography – College Level Geography

Lesson Description: In part one, students describe spatial occurrence of earthquakes and tectonic landforms. Students practice Boolean logic queries to select data and describe spatial patterns. In part two, students develop and test hypotheses to explore the relationship between earthquake magnitude, location depth and the impact on human life and property.

Education Standards:

Common Core Standard English Language Arts Standards: English language Arts Standards ».History / Social Studies » Grade 12

CCSS.ELA-Literacy.RH.11-12.7: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem**.**

Common Core Standard English Language Arts Standards: English Language Arts Standards » Science & Technical Subjects » Grade 11-12

CCSS.ELA-Literacy.RST.11-12.3: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

ITSE National Technology:

3. Research and Information Fluency
    a. Plan strategies to guide inquiry
    b..Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
    c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
    d. Process data and report results
4. Critical Thinking, Problem Solving, and Decision Making
    c. Collect and analyze data to identify solutions and/or make informed decisions
5. Digital Citizenship
    b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
6. Technology Operations and Concepts
    a. Understand and use technology systems

b. Select and use applications effectively and productively

National Geography Standards

1) How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information
2) How to analyze the spatial organization of people, places, and environments on Earth's surface
3) How to apply geography to interpret the present and plan for the future

Geospatial Skills: The students will be able to:

1) Describe the spatial patterns, associations, and regions of earthquake occurrence.
2) Identify spatial distribution.
3) Design Boolean Logic queries.
4) Evaluate correlations as positive, negative or non existent.
5) Discuss spatial connections.

Materials: Computer access with high-speed internet, student activity sheets.

Pre-Teaching:

1) Students should have completed the GIS Tutorial activity and be familiar with geospatial skills such as viewing data layers, performing a Boolean logic queries and analyzing spatial patterns.
2) Students should be introduced to basic principles of tectonic movements and earthquakes.

Lesson Procedure: After introducing tectonic processes students are given the tectonic activity to complete outside of class. Following the completion of the assignment, in class students will discuss the overall patterns and correlations and the association of movement and resulting landforms. Part two is assigned after introducing earthquakes. Again this is an out of class assignment. In class, students are placed in small groups to compare and discuss their findings.

Time to Teach:

Part one and Part two each take approximately 45 minutes to complete. The in class discussions should take about 20 minutes each.

References and Citations:

1) USGS EarthQuake Hazards http://earthquake.usgs.gov/
2) Tectonic Landforms
http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/tectonics_landforms/title_page.html