

Japan Earthquake and Tsunami 2011

Standards/Benchmarks:

- Use skills of scientific inquiry processes (e.g., hypothesis, record keeping, description and explanation).
- Give examples of how thinking scientifically is helpful in daily life.
- Recognize that scientific literacy is part of being a knowledgeable citizen.
- Explain the results of plate tectonic activity (e.g., magma generation, igneous intrusion, metamorphism, volcanic action, earthquakes, faulting and folding).
- Describe ways human settlements and activities are influenced by environmental factors and processes in different places and regions including: bodies of water; landforms; climates; vegetation; weathering; and seismic activity.

Rationale: I teach a small group self-contained Emotionally Disturbed class. This class has 9-12 grade students. I would teach this lesson in my Earth Science class after covering units on plate tectonics, earthquakes and tsunamis. This lesson could easily be used with a larger group or with lower grade levels.

Teacher Materials Needed:

- A computer for each student, or every two students.
- <http://www.nytimes.com/interactive/2011/03/11/world/asia/maps-of-earthquake-and-tsunami-damage-in-japan.html>
- <http://www.japanquakemap.com/>
- graph paper

Student Materials Needed:

- paper
- pencil
- colored pencils or thin-line markers
- ruler
- computer

Length of Time Needed for Lesson: 1 class period of 45 minutes

Instructional Procedures:

- Make sure that students have a basic understanding of plate tectonics and the relationship between plate movements and earthquakes. To guide the discussion, review the following questions: What are tectonic plates? What are faults? What relationships do tectonic plates and faults have with earthquakes? What is the Richter scale? What do the numbers on the Richter scale mean? Where are some places that earthquakes occur frequently? What causes a tsunami to form?
- Ask students if they remember what happened on March 11, 2011. Have a brief discussion.
- Use the NY Times website to show students how shifting plates caused the earthquake and tsunami in Japan. Read descriptions along with showing the site. Students (if they

have their own computer) can go through the interactive model on their own and read descriptions.

- Have students then go to the Japan quake map website. Have students pick the day March 11, 2011. 78 earthquakes should show up as occurring that day.
- Have students select any 10-15 earthquakes that occurred that day. They need to write down the magnitude and depth of each quake selected.
- Students then will create a graph displaying the information.

Differentiated Instruction: Visual – Students will watch an interactive display of how the Japan earthquake and tsunami of 2011 occurred. They will also see a map of Japan and indications where each earthquake occurred. Kinesthetic – Students will use a mouse and keyboard on the computer and will create a graph by hand. Auditory – If descriptions are read aloud, they will also hear how the earthquake and tsunami occurred.

Assessment: Students will be assessed on the graph they make.

Resources:

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