

Earthquakes Around the World

Jennifer Finta

Grade level: 6th grade

Time: 2- 1 hour class periods

Statement of Problem: Where do most earthquakes occur on Earth? How do Earthquakes occur?

Intended Outcomes:

-Gather and use real time data to determine where most earthquakes occur.

-Formulate ideas about how earthquakes occur.

Materials:

Map of the Earth, Science Journals, World Map Large, Post it notes/push pins, Computers/Internet access

Safety Precautions: Internet Safety

Background Knowledge: Latitude/longitude, mapping skills, an idea about what an earthquake is,

Magnitude of earthquakes

Lesson:

1. Providing a large map of the world and asking students in small groups to think about where earthquakes occur. How/ why do they occur here? Are there boundaries on our Earth, why do you think we have them? Where are they on the map? After group discussion begin with a chart "What we think about earthquakes" and class discussion recording ideas on butcher paper around the three questions:
 - a. What do we think about earthquakes? (before/during lesson)
 - b. How can we find out? (before/during lesson)
 - c. What do we conclude? (come back to after lesson, final wrap up)
2. Assign small groups a month for the current year or previous year and have them visit USGS website to collect data in their science journals (need to set up data charts including Magnitude, Date/Time, Latitude, Longitude, and region columns) for 20 Earthquakes that have taken place during their month.
3. Students in their small groups will then plot their points on their map. While in groups teacher circulates and asks probing questions:
 - a. What have you discovered so far?
 - b. How do you know where to plot your points? What determines this location?
 - c. Are you seeing patterns? If so where, when, why do you think this?

- d. What do you notice about the magnitude? Patterns?
 - e. How many earthquakes did you think occurred? How many do you think are really occurring daily? Weekly? Monthly? Yearly?
4. Once small groups have plotted their data they will plot their data on a large class size map. Using different color post it notes or pushpins to evaluate group's accuracy and contribution. Once mapping is completed open up a group discussion and add ideas to "What we think about earthquakes" chart. Probing questions and thoughts should consist of:
 - a. The above listed questions in conjunction with...
 - b. Patterns that emerge
 - c. Why do some areas have more earthquakes than other places?
 - d. Be looking for misconceptions and ideas about Pangaea, plate tectonic, and earth's crust
5. Provide students with a map that shows plate tectonics. Ask students what they can conclude about the earthquakes and the plate tectonic maps. Have students write a type 1 writing about what they notice, questions that they have and what they have discovered in today's lesson.
6. Students should know that they will be learning in the next several days how plate tectonics are responsible for earthquakes, volcanic eruptions, trenches, and mountain building.

Assessment:

As this would be one lesson in the unit teachers should assess throughout the individual lessons. In this lesson the assessment comes through group discussion, whole class discussion, the mapping and the final type 1 writing assignment. A culminating assessment after students gain more knowledge about plate tectonics students would be to create a narrated google earth tour. In the tour they would have to locate real locations and provide information related to the earth features that plate tectonics are responsible for creating.

Example test questions after a complete unit may be.

1. Earth's surface is always changing, what are three examples of processes that result in the Earth's surface changing?
 - 1.
 - 2.
 - 3.
2. Ms. Finta's class has been observing, recording, and mapping earthquakes all over the world. They notice that many of the earthquakes happen in specific areas. Which is the BEST explanation for this?
 - A. Earthquakes happen where the population is high.
 - B. Earthquakes only happen along coastlines of the ocean.
 - C. Earthquakes occur along the borders of plate tectonics.
 - D. Earthquakes occur where people dig deep holes in the earth's crust.

3. Earthquakes occur when.....

- A. Tectonic plates rub together
- B. Plates pull apart
- C. Magma pushes up through the crust
- D. Seismic activity is increased

Reference:

Battle Creek Area Mathematics and Science Center. (2011). Retrieved from <https://www.bcamsc.org/>