Mapping Locations of Earthquakes and Volcanoes

INVESTIGATION

WHEN CONSIDERING WHERE to store nuclear waste, it is important to know where earthquakes and volcanoes do or may occur. In this activity, you will use technology to plot the locations of major earthquakes and volcanoes using large sets of data. As you analyze and interpret the data, you will look for patterns in the locations of earthquakes and volcanoes.

GUIDING QUESTION

What patterns can we see when examining the locations of earthquakes and volcanoes?

The image on the left shows Mt. Mayon, a volcano in the Philippines. The image on the right shows some of the destruction from the 2017 earthquake in Mexico City.

MATERIALS

For each pair of students

> 1 computer with Internet access

For each student

> 1 Student Sheet, "Map of the World"

PROCEDURE

1. Your teacher will assign each pair of students in your group to map a set of either earthquake data or volcano data.

2. Open the "Mapping Location Data" activity link on your computer.

3. Follow the onscreen instruction to open the file that you were assigned: earthquakes or volcanoes.

4. Take a few minutes to familiarize yourself with the options in the program. Make sure to try

   • zooming in and out, and moving the map around.

   • changing the colors in the legend at the bottom of the map.

   • highlighting locations on the map.

   • sorting the data by column.

   • switching between Topo View and Ocean View.

   Hint: You can find help through the Help button or by asking your teacher.

5. Look for patterns in the locations of the earthquakes and volcanoes, depending on the data set you have been assigned.

6. In your science notebook, make a T-chart. On the left side, title the column "Patterns and Observations." Title the column on the right "Questions." Using the T-chart, describe the patterns that you see and any questions that you have about the data you are viewing.

7. Use Student Sheet, "Map of the World," to sketch lines that represent the approximate locations of the volcanoes or earthquakes, if they appear to follow any patterns.

8. Use the program to look for further patterns related to the locations of the 20 strongest earthquakes or the 20 tallest volcanoes, depending on which data set you have been assigned.

9. Start a new row in your T-chart. Using data of strong earthquakes or tall volcanoes, continue to describe the patterns that you see and any questions that you have.

10. Share the map you have drawn on Student Sheet 6.1 with the other pair of students in your group.

11. Discuss any similarities and differences between the earthquake and volcano maps.

12. After viewing the maps of both earthquake and volcano data sets, write down at least two similarities and two differences your group notices. Write down any questions that you have as a group related to the locations of earthquakes and volcanoes.

13. Follow your teacher's directions to discuss your questions and observations with the class.

ANALYSIS

1. Describe any patterns you saw with the locations of earthquakes and volcanoes.

2. After drawing lines to designate the patterns of earthquakes and volcanoes, did you notice any locations that did not seem to be part of any pattern? If so, hypothesize why some earthquakes and/or volcanoes don't appear to fit any pattern.

3. Which parts of the world have had most of the

   a. strongest earthquakes?

   b. tallest volcanoes?

4. If you were to look at the data sets, the earthquake data came with dates included, but the volcano data only provided locations. Why might this be so?

EXTENSION

What are the hazards associated with earthquakes and volcanoes? Visit the NOAA Natural Hazards page at https://maps.ngdc.noaa.gov/viewers/hazards/.