

Where Do Earthquakes and Volcanoes Occur?

Quick Write: Describe an experience that you may have had with an earthquake or volcanic eruption.

Think-Pair-Share: What controls the location of earthquakes and volcanoes on Earth? Are the locations of volcanoes and earthquakes related to one another?

In this activity, you will examine a data set with the locations of major earthquakes and active volcanoes around the Earth.

Directions:

1. You will work in a group of four.
2. On the following pages, there are four lists: two lists of active volcanoes and two lists of major earthquakes. Each student should choose one list of volcanoes or earthquakes to plot on the map. In your group, all of the volcanoes and earthquakes will be plotted
3. Use a pencil and ruler to locate each of the volcanoes or earthquakes on your list on the world map using the latitude and longitude.
4. On your map, indicate which list you are plotting.
5. When you are satisfied that you have correctly located the position on the map, use a colored pencil to mark the location with a dot.
6. Write the number of the earthquake or volcano on the map next to the dot.
7. When all of the locations have been completed in your group, examine the other students' maps and discuss the following questions within your group and record your answers.

Student Data Sheet

Questions

1. Are earthquakes and volcanoes evenly distributed or are they unevenly distributed on the Earth's surface?
2. Are the locations of earthquakes and volcanoes related to one another? Are there exceptions?
3. Where are most of the earthquakes and volcanoes located on Earth?
4. Examine the plate tectonic map on the last page and compare the locations of earthquakes and volcanoes with the tectonic plates. Describe the relationship between the locations of earthquakes and volcanoes with the tectonic plates that form the Earth's crust.
5. Propose a reason why the locations of earthquakes and volcanoes are related to tectonic plates.

Student Data Sheet

Currently there are over 1500 active volcanoes in the world. An active volcano is one that has erupted at least once in the past 10,000 years and is likely to erupt again. The tables below provide the position by latitude and longitude for 20 active volcanoes.

Volcano List 1

	Name	Latitude	Longitude
1	Azul	36°S	71° W
2	Bezymianny	56° N	161° E
3	Cerro Negro	13° N	87° W
4	Cotopaxi	1° S	78° W
5	Katmai	58° N	155° W
6	Kilauea	19° N	155° W
7	Krakatoa	6° S	105° E
8	Ksudach	52° N	158° E
9	Mt. Lassen	40° N	122° W
10	Mt. Fuji	35° N	139° E

Volcano List 2

	Name	Latitude	Longitude
11	Mt. Pelee	15° N	61° W
12	Mt. Rainier	47° N	122° W
13	Mt. St. Helens	46° N	122° W
14	Paricutin	20°N	102° W
15	Pinatubo	15° N	120° E
16	Surtsey	63° N	20° W
17	Tambora	10° S	120° E
18	Lauca	18° S	69° W
19	Adagdak	52° N	176° W
20	Nevada del Ruiz	5° N	75° W

Student Data Sheet

The frequency of major earthquakes depends upon the magnitude. The larger the magnitude, the less frequently they occur. On average, ~150 earthquakes with a magnitude greater than 6.0 occur annually in the world. The tables below provide the position by latitude and longitude for 20 major earthquakes.

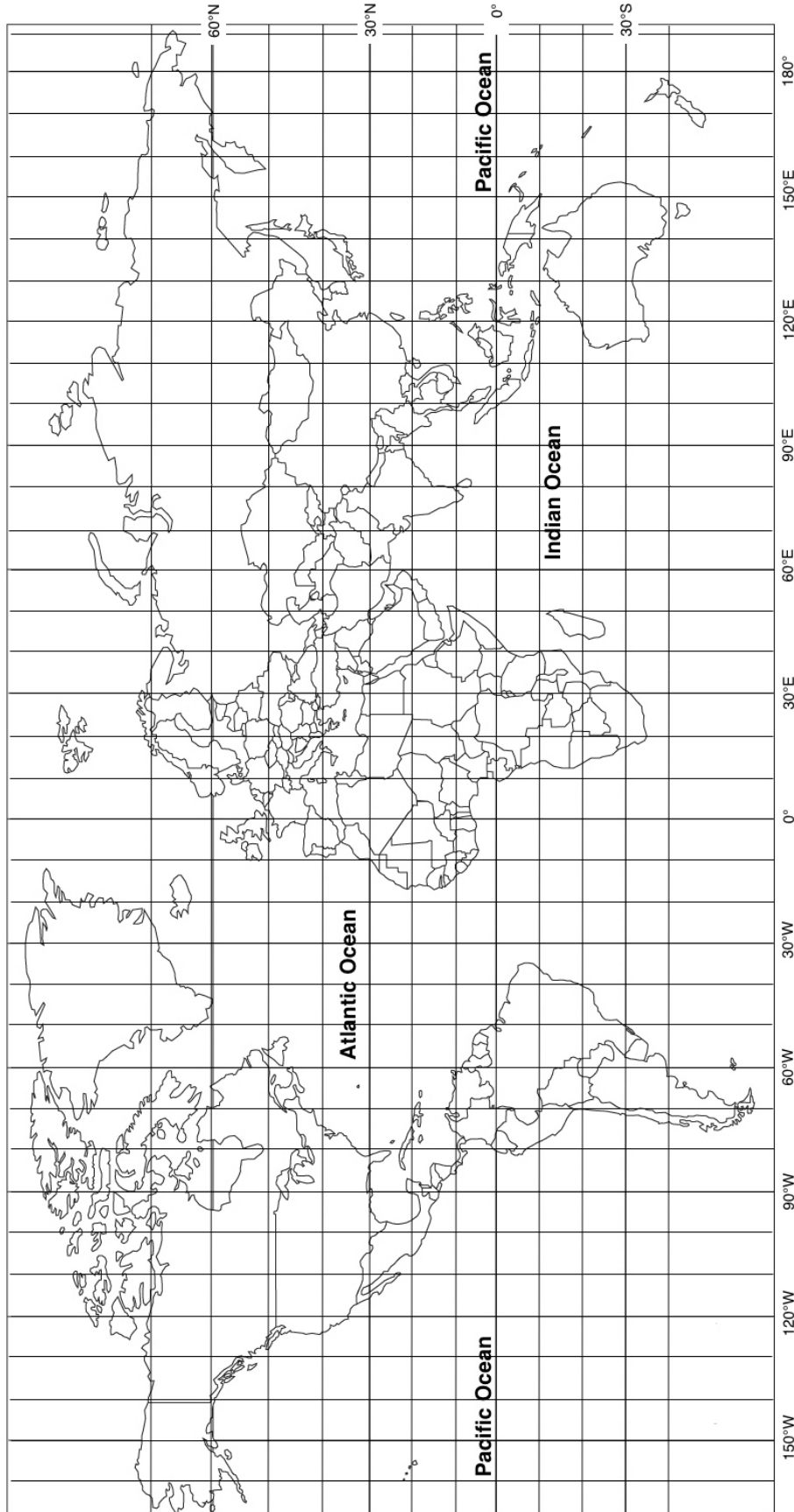
Earthquake List 1

	Location	Magnitude	Latitude	Longitude
1	Valdivia	9.5	40° S	73° W
2	Prince William Sound	9.2	61° N	147° W
3	Sumatra	9.2	3° N	96° E
4	Tohoku	9.0	38° N	142° E
5	Kamchatka	9.0	53° N	161° E
6	Arica	9.0	18° S	71° W
7	Cascadia	9.0	45° N	125° W
8	Arakan	8.8	22° N	92° E
9	Ecuador-Colombia	8.8	1° N	81° W
10	Maule	8.8	36° S	73° W

Earthquake List 2

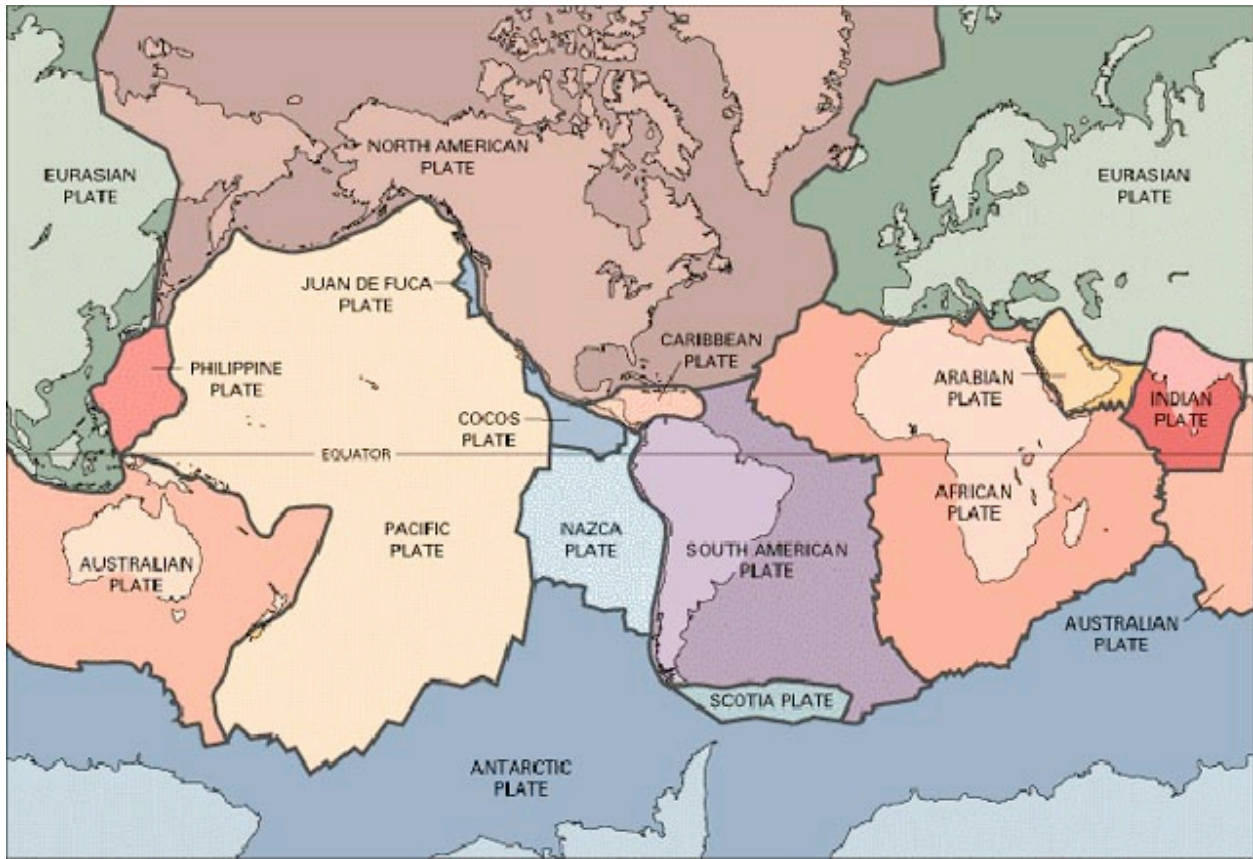
	Location	Magnitude	Latitude	Longitude
11	Assan	8.7	28° N	96° E
12	Rat Islands	8.7	51° N	179° E
13	Kuril	8.5	45° N	150° E
14	Erzincan	7.8	40° N	40° E
15	Celebes	8.3	5° N	123° E
16	Lo Mustang	8.2	29° N	83° E
17	Fort Tejon	7.9	36° N	120° W
18	Mexico City	8.0	18° N	103° W
19	Vancouver Island	6.6	49° N	129° W
20	Sandpoint	8.3	55° N	158° W

Student Data Sheet



Student Data Sheet

The Earth's crust is composed of rigid plates that may move relative to one another on the Earth's surface. The map shows the major tectonic plates that form the Earth's crust. Note that a tectonic plate may contain both portions of a continent and seafloor. The black lines between the plates represent the margins between the plates.



USGS