

Introduction:

An earthquake is a movement of Earth's lithosphere that occurs when rocks in the lithosphere suddenly shift, releasing stored energy. As tectonic plates move, they cause stress in the crust, which in turn produces faults and folds. A fault is a break in a mass of rock along which movement occurs. Most faults occur along plate boundaries. A fold is a bend in layers of rock, but the rocks do not break. These occur under high temperature and pressure. Within Earth's crust, forces are at work along faults. Sometimes the rocks along the two sides of a fault will remain locked due to friction and build up large amounts of energy. When the amount of stress pushed the boundary past its limit, the plates release that energy in the form of an earthquake.

A volcano is a mountain that forms when magma reaches the surface. Under certain conditions, small amounts of mantle rock can melt, forming liquid magma. The magma rises upward through the crust, erupting at the surface as a volcano. Most volcanoes occur along plate boundaries or at hot spots in the crust. Volcanoes often form along a converging plate boundary where an oceanic plate is subducted into the mantle. Many volcanoes also form along the trenches that rim the Pacific Ocean. The region is called the "Ring of Fire." They can also form along diverging plate boundaries where magma rises to fill the gap between two separating plates.

In the following activity you are going to map the locations of boundaries present around the world as well as the locations of earthquakes and volcanoes.

Step 1: Mapping Plate Boundaries

Using **Figure 29** on page 682, draw the locations of each crustal plate. Then color code the different boundaries that exist between each set of plates. Be sure to include a key. For example, along the west coast of the United States, you have the Pacific Plate and the North American Plate. Which boundaries are created by those 2 plates? Then add the direction in which the plates are moving. By the time you are done with step one, your map should look almost exactly like Figure 29.

Questions: Answer the following questions in complete sentences after completing Step 1.

- 1) What boundary is present between two oceanic plates? Give an example.

- 2) What boundary is present between an oceanic and continental plate? Give an example.

- 3) What boundary is present between two continental plates? Give an example.

Step 2: Mapping Earthquakes and Volcanoes

Using the following coordinates, plot the location of each earthquake in one color and each volcano in another color.

EARTHQUAKES		VOLCANOES	
^o Latitude	^o Longitude	^o Latitude	^o Longitude
40N	120W	60N	150W
5S	110E	35S	70W
4S	77W	45N	120W
23N	88E	15N	61W
14S	121E	20N	105W
7N	34E	0	75W
44N	74W	40N	122W
30S	70W	40N	30E
45N	10E	30N	60E
13N	85W	55N	160E
23N	125E	3S	37E
35N	30E	40N	145E
35N	140E	10S	120E
46N	12E	41N	14E
28N	75E	5S	105E
61N	150W	15N	35E
47S	68W	30S	70W

Questions: Answer the following questions in complete sentences.

- 1) Discuss the distribution of earthquakes and volcanoes over the surface of the Earth. Are they scattered at random or are they concentrated in zones? Describe your observations.
- 2) Find one volcano on your map. What type of boundary is it on? Does this make sense? Why or why not?
- 3) Can you make a conclusion about the type of boundary and the locations of volcanoes?
- 4) Find one earthquake on your map. What type of boundary is it on? Does this make sense? Why or why not?
- 5) Can you make a conclusion about the type of boundary and the locations of earthquakes?

Name _____ Period _____

MAP OF WORLD EARTHQUAKES & VOLCANOES



