Name _____

Volcanoes Change the Earth

Be a Vulcanologist

In the library or on the Internet, find the location of a volcano. Find its name, its longitude and latitude, and the most recent eruption. You will mark this volcano on a world map for your class.

Name of volcano	
Longitude	
Latitude	
Date of last eruption	

Look at the pins from your entire class. Do you see any patterns?_____

_____

_____

_____

Where are the most active volcanoes?_____

Fire From the Earth

Volcanoes are spectacular and destructive features on our planet. They have been described and explained by different cultures for thousands of years. However, it has only been since the middle of the 20th century that their origin in our changing Earth can be adequately explained.

Part of the secret of volcanoes comes from Plate Tectonic Theory. Seven major plates, and numerous smaller cracks within these plates, shift across the mantle of the Earth. At the edges of the plates, magma can seep through cracks in the crust to emerge at the surface. But not all plate boundaries are marked by volcanoes.

If two plates converge, one an oceanic plate and one a continental plate, then the one that is most dense will slide under the other one. Usually the oceanic plate will slide under the continental plate. To illustrate this, move your hands together and have one slide under the other. This process is called *subduction.* Where the two plates converge, an oceanic trench is often formed. The deepest one on Earth is the Mariana Trench in the Pacific. It is near Australia.

When the oceanic plate is sliding under the continental plate, where does it end up? It ends up on the mantle, which is made of molten rock or magma. Since it is so hot, the oceanic plate starts to melt to become part of the magma. Thus, rock is being recycled. Keep in mind that this entire process does not happen quickly but over hundreds and thousands of years. A plate might only move one centimeter a year!

Where two plates meet, there are often tiny cracks, or fissures, where some of the less dense magma might rise. As it rises to fill in these cracks, pressure might build up enough to have the magma break through to the surface of the earth as lava. Depending on the forces involved, a large volcano may erupt violently or lava may just flow from the volcano. If there is lot of water mixed with the magma, a more violent explosion may occur. If there is a lot of silica in the magma, the lava may flow more slowly. However, if it is moving more slowly, the escape hole (vent) of the volcano may become plugged. If the vent is plugged and the pressure continues to build, again a violent explosion may occur.

Not all volcanoes are formed at plate edges. The Hawaiian Islands are right in the middle of a plate. But they are on a very thin area of the crust. Under them, the magma is so hot that it burns right through the crust to form volcanoes. The lava forms islands. New Hawaiian Islands are formed each century.

Are They The Same?

Earthquakes often occur in the same areas as volcanoes. But are they the same?

Graph the frequency of earthquakes and volcanoes over several months. Put the months across the bottom of your graph. Then put four dates between each month. Put frequency (1 through 15) along the side. Make two different line graphs, one for volcanoes and one for earthquakes.

Month/ Year	Week Ending	Active Volcanoes	Earthquakes
Sept 00	1	1	11
	8	3	8
	15	0	9
	22	2	6
	29	0	12
Oct 00	6	2	7
	13	1	10
	20	2	7
	27	1	9
Nov 00	3	2	9
	10	2	7
	17	1	15
	24	0	5
Dec 00	1	0	8
	8	1	7
	15	1	6
	22	1	11
	29	1	8
Jan 01	5	0	5
	12	1	8
	19	1	10
	26	2	10

Does this data show any relationship?_____