

## Predicting Volcanic Eruptions

Geology

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Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

Using the websites <http://volcanoes.usgs.gov/about/edu/predict/> and <http://volcanoes.usgs.gov/>, do the following.

Go through the website *Predicting Volcanic Eruptions* and answer the following. I recommend using medium screen resolution.

### **Part 1: Introduction**

1. Who is Thomas A. Jaggar? What did he do?
2. Why is it necessary to be able to forecast volcanic eruptions?

### **Part 2: Instruments**

1. What is a seismometer? Describe how they work.
2. What is a tilt meter? Describe how they work.

### **Part 3: Ground Deformation**

1. What causes the volcanic mountain to start faulting and tilting?
2. How did scientists gauge the movement of the thrust fault?
3. Draw a sketch below of the graph showing distance between gauging stakes versus time.
4. What does it mean to volcanologists when the distance between the gauging stakes becomes shorter very rapidly?
5. Draw a sketch of the graph showing tilt angle versus time.
6. What happens to the angle of the tilt meter just before a volcanic eruption?
7. Draw a sketch of the graph showing # of earthquakes versus time.
8. What happens to the frequency of earthquakes just before a volcanic eruption?

**Part 4: Earthquakes**

1. What happens to the amplitude reading on the seismograph the closer the seismometer is to the earthquake?
2. Why did the earthquake caused by the fault on the right register almost immediately?
3. Describe how seismologists and volcanologists find the location (epicenter) of earthquakes.
4. What is the difference between long period and short period earthquakes? Which one is a better indicator of an impending volcanic eruption?

**Part 5: Exercise**

1. In your volcanic prediction, what was the best action to take initially on February 21<sup>st</sup>? Why?
2. What was your choice of action on March 3<sup>rd</sup>? Why?
3. What was your choice of action on March 17<sup>th</sup>? Why?

**Part 6: Kilauea**

1. How was the Kilauea eruption of 1983 predicted?
2. What were the results of the eruption? Is the eruption still taking place today?

**Part 7: Mt. St. Helens**

1. How was the Mt. St. Helens eruption of 1980 predicted?
2. What were the results of the eruption?

**Part 7: Conclusion**

1. Search the USGS volcano hazards website. What are some other methods (besides the ones that you studied) that are used for predicting volcanic eruptions?