**Teaching About Volcanoes in a Plate Tectonics Context**

**Using “Claim – Evidence – Reasoning” to Promote Inquiry and Student Learning**

Question: Where are volcanoes found in relation to plate boundaries?

This claim can be made from the maps in this activity

Claim: Volcanoes can exist in different settings.

* Some volcanoes occur on plate boundaries
* Volcanoes occur in large numbers on convergent plate boundaries
* Volcanoes occur in small numbers on divergent (e.g., mid-ocean ridge) plate boundaries
* Volcanoes occur in small numbers far away from plate boundaries

Question: How does the nature of a volcanic eruption vary depending on the volcano’s setting?

This claim can be made from the videos\* and text presented in this activity

Claim: Volcanoes in different tectonic settings have different eruptive behaviors.

* Volcanic eruptions on convergent plate boundaries are often explosive
* Volcanic eruptions on divergent (e.g., mid-ocean ridge) plate boundaries usually take place under water and do not explode; they are characterized typically by flowing lava
* Volcanic eruptions away from plate boundaries are often characterized by flowing lava

Question: In what environment are volcanic eruptions likely to be the most dangerous?

This claim can be made from the videos and text presented in this activity

Claim: Subduction (arc) volcanic eruptions are more dangerous than eruptions at hotspots.

* Volcanic eruptions on convergent plate boundaries are often explosive
* Volcanic eruptions on divergent (e.g., mid-ocean ridge) plate boundaries are usually quiet
* Volcanic eruptions far away from plate boundaries and *within ocean basins* are often characterized by flowing lava
* Volcanic eruptions far away from plate boundaries and *on continents* are often explosive
* Arc volcanoes are often located in densely populated areas

Question: How do the ages of adjacent volcanoes indicate their plate tectonic setting?

This claim can be made from the graphing exercise (and the data table) in this activity

Claim: Volcanoes record age progressions that document plate motion.

* The volcanic rocks of the Hawaiian Island chain record an age progression in the Pacific Ocean
* The relationship between volcano age and distance from the modern hotspot is constant
* Subduction around the Pacific rim requires the oceanic plate to be moving
* The Indonesian island volcanoes are all the same age
* Indonesian volcanoes are along a single plate boundary

\*<http://www.paesta.psu.edu/classroom/teaching-about-volcanoes-plate-tectonic-context>