## Anatomy of a Volcanic Eruption:

Case Study: Mt. St. Helens

Materials Included in this Box:

Teacher Background Information 3-D models of Mt. St. Helens (before and after eruption) Examples of stratovolcano rock products: Tuff (pyroclastic flow), pumice, rhyolite/dacite, ash Sandbox crater formation exercise Laminated photos/diagrams

## Teacher Background

There are several shapes and types of volcanoes around the world. Some volcanoes occur on . But there are also volcanoes

that occur in the middle of tectonic plates like the Yellowstone volcano and Kilauea volcano in Hawaii.

When asked to draw a volcano most people will draw a steeply sided, conical mountain that has a depression (crater) at the top. This image of a 'typical' volcano is called a stratovolcano (a.k.a. composite volcano). While this is the often visualized image of a volcano, there are actually many different shapes volcanoes can be. A volcano's shape is mostly determined by the type of magma/lava that is created underneath it. Stratovolcanoes get their shape because of the thick, sticky (viscous) magma that forms at subduction zones. This magma/lava is layered between ash, pumice, and rock fragments. These layers of ash and magma will build into high elevation, steeply sided, conical shaped mountains and form a 'typical' volcano shape.

Stratovolcanoes are also known for their explosive and destructive eruptions. Eruptions can cause clouds of gas, ash, dust, and rock fragments to eject into the atmosphere. These clouds of ash can become so dense and heavy that they quickly fall down the side of the volcanoes as a pyroclastic flow. When pyroclastic flows mix with surface water (from snow, rivers, and/or lakes) it becomes a lahar. Lahars move down the mountain like cement, taking everything with it. Magma will also ooze out of the volcano but is so thick and viscous that it does not travel very far. This magma will form a magma dome inside the crater. As material is

Lesson Instructions

- 1. Ask the class if they can think of the name of any volcanoes that they have heard of. They may say Mt. St. Helens, Hawaii, Mt. Rainier, or Yellowstone. If not, you can go over some of the more famous volcanoes with them.
- 2. After discussing some of theses famous volcanoes, ask them what these volcanoes look like? Have them describe or draw the shape and size of them. You can show them the diagram of different volcano shapes while discussing.
- 3. Review the two main types of volcanoes and their shapes: Shield Volcanoes and Composite Volcanoes.
- 4. Show the class the 3-D model of Mt. St. Helens BEFORE . Ask them to identify the type of volcano.
- 5. Discuss stratovolcanoes and their p

- Clicking and dragging the person to a location will put you in ground-level view, the image will appear as though you are standing on the ground in that location.
- The slide zoom beneath that will zoom in and out of the image, you can also do this using the roller on the mouse.

Zooming into the volcano, observe some of the different parts to the volcano. You can see and explore the caldera, lava dome (inside the crater). Look for lahars (volcanic mud

You can search some of the other volcanoes that you discussed in the class and see if