

VOLCANOES

The intense heat and pressures in the mantle turn solid rock into liquid **magma**. Magma comes out through the surface of the crust to form volcanoes. The type of volcano formed and the style of eruption depends on the silica content, and therefore, the **viscosity** of the magma.

The "Ring of Fire" is a series of volcanoes that indicates tectonic plate boundaries and contains about 75% of the world's active volcanoes. The "Ring of Fire" marks the boundary of the Pacific Ocean basin.

Volcanoes and Plate Boundaries

The



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Explosive eruptions occur when highly viscous magma (that is, magma with a very high silica content) erupts through continental crust. Explosive eruptions are truly explosive and extremely destructive. They throw hot ash, particles and chunks of rock, and gases into the air. Ash from explosive eruptions can travel into the stratosphere and encircle the entire Earth for many years. This ash layer can lower global temperatures. Explosive eruptions are typical of tectonic plate boundaries where an oceanic plate is subducted under a continental plate.

The ash and rock that is extruded by explosive volcanoes is called **pyroclastic material**. A mudflow of mixed water and volcanic ash can travel very, very quickly down a volcano and cause widespread destruction. This volcanic mudflow is called a **lahar**.



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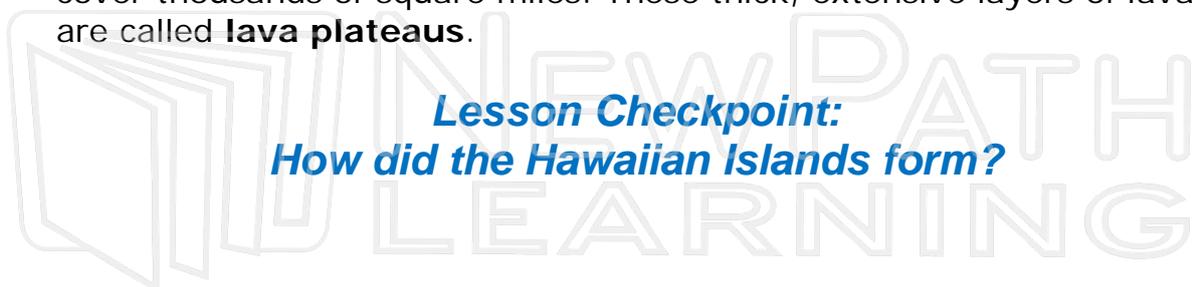
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Sometimes lava flows out of a long crack in the crust rather than through a hole. When this happens, extremely thick layers of lava can cover thousands of square miles. These thick, extensive layers of lava are called **lava plateaus**.

***Lesson Checkpoint:
How did the Hawaiian Islands form?***



Three Types of Volcanoes

Volcanoes can also be classified based on their shape. The three categories are **cinder cones**, **shield volcanoes** and **stratovolcanoes**.

Cinder cones are relatively small volcanoes formed by the accumulation of pyroclastic material. The sides of cinder cones are steep. Shield volcanoes are wide, flat volcanoes formed by the non-explosive flow of lava onto the surface. The largest shield volcano in our solar system is Olympus Mons on Mars. Stratovolcanoes are the most common type of volcanoes. They are formed by the alternating of layers of pyroclastic material and lava flows. Below are pictures of each type of volcano.



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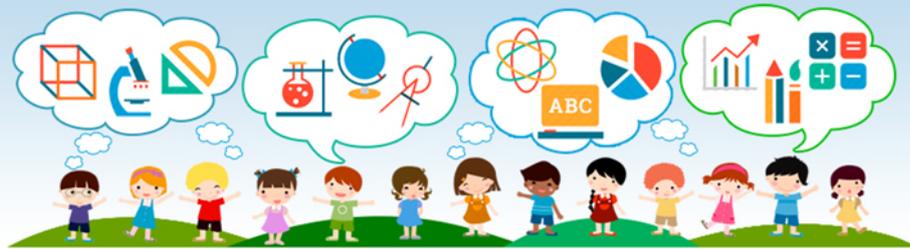


Mauna Loa, a shield volcano, in Hawaii



Mt. St. Helens, a stratovolcano, erupted in 1980 in Washington State

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Lesson Checkpoint:
Name the three categories of volcanoes.

