



Volcanoes

Volcanoes and Plate Tectonics
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Volcanoes and Plate Tectonics

Where are most of Earth's volcanoes found?

- Volcanic belts form along the boundaries of Earth's plates
 - Ring of Fire: a major belt of volcanoes that rims the Pacific Ocean
 - Volcano: a weak spot in the crust where magma has come to the surface
 - Magma: the molten mixture of rock-forming substances, gases, and water from the mantle
 - Lava: liquid magma that reaches the surface; also the rock formed when liquid lava hardens
 - Island arc: a string of islands formed by the volcanoes along a deep-ocean trench



Volcanoes and Plate Tectonics

How do hot spot volcanoes form?

- A volcano forms above a hot spot when magma erupts through the crust and reaches the surface.
 - Hot spot: an area where magma from deep within the mantle melts through the crust above it



Properties of Magma

Why is it helpful to know the physical and chemical properties of a substance?

- Each substance has a particular set of physical and chemical properties.
- These properties can be used to identify a substance or to predict how it will behave.
 - Element: a substance that cannot be broken down into other substances
 - Compound: a substance in which two or more elements are chemically joined
 - Physical property: any characteristic of a substance that can be observed or measured without changing the composition of the substance
 - Chemical property: any property of a substance that produces a change in the composition of matter



Properties of Magma

What causes some liquids to flow more easily than others?

- Some liquids flow more easily than others due to viscosity.
 - Viscosity: the resistance of a liquid to flowing



Properties of Magma

What factors determine the viscosity of magma?

- The viscosity of magma depends upon its silica content and temperature.
 - Silica: a material found in magma that is formed from the elements oxygen and silicon
 - Pahoehoe: a hot, fast-moving type of lava that hardens to form smooth, ropelike coils
 - Aa: a slow-moving type of lava that hardens to form rough chunks; cooler than pahoehoe



Volcanic Eruptions

What happens when a volcano erupts?

- The force of the expanding gases push magma from the magma chamber through the pipe until it flows or explodes out of the vent.
 - Magma chamber: the pocket beneath a volcano where magma collects
 - Pipe: a long tube through which magma moves from the magma chamber to Earth's surface
 - Vent: the opening through which molten rock and gas leave a volcano
 - Lava flow: the area covered by lava as it pours out of a volcano's vent
 - Crater: a bowl-shaped area that forms around a volcano's central opening



Volcanic Eruptions

What are the two types of volcanic eruptions?

- Geologists classify volcanic eruptions as quiet or explosive.
 - Pyroclastic flow: the expulsion of ash, cinders, bombs, and gases during an explosive volcanic eruption



Volcanic Eruptions

What are a volcano's stages of activity?

- Geologists often use the terms *active*, *dormant*, or *extinct* to describe a volcano's stage of activity.
 - Dormant: describes a volcano that is not currently active, but that may become active in the future
 - Extinct: describes a volcano that is no longer active and is unlikely to erupt again



Volcanic Landforms

What landforms do lava and ash create?

- Volcanic eruptions create landforms made of lava, ash, and other materials.
 - Shield volcanoes: a wide, gently sloping mountain made of layers of lava and formed by quiet eruptions
 - Cinder cone volcanoes: a steep, cone-shaped hill or small mountain made of volcanic ash, cinders, and bombs piled up around a volcano's opening
 - Composite volcanoes: a tall, cone-shaped mountain in which layers of lava alternate with layers of ash and other volcanic materials
 - Lava plateaus: high, level areas formed when thin, runny lava flows out of long cracks in an area



Volcanic Landforms

How does magma that hardens beneath the surface create landforms?

- Volcanic necks: a deposit of hardened magma in a volcano's pipe
- Dikes: a slab of volcanic rock formed when magma forces itself across rock layers
- Sills: a slab of volcanic rock formed when magma squeezes between layers of rock
- Batholiths: a mass of rock formed when a large body of magma cools inside the crust
- Dome mountains: a smaller body of hardened magma



Volcanic Landforms

What other distinctive features occur in volcanic areas?

- Hot springs and geysers are types of geothermal activity that are often found in areas of present or past volcanic activity.
 - Geothermal activity: the heating of underground water by magma