



Volcanoes: The Benefits and Devastation

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Volcanoes: The Benefits and Devastation

A volcano is an opening in Earth's crust through which gas-rich underground molten rock called magma can escape to the surface where it is transformed into lava. More specifically, it refers to mountains produced by volcanic activity, known as volcanism or vulcanism. In a volcanic eruption, magma or just the hot gases from the magma, escape from an underground reservoir to the surface through a relatively narrow vent, or conduit. (Gates and Ritchie, 2007)

A volcano can be active, dormant or extinct. An active volcano is erupting and showing signs of unrest. A dormant volcano is not currently active, but could erupt again. An extinct volcano is considered unlikely to erupt again. (Usgs.gov, 2009)

Major Types of Volcanoes

A steep symmetrical cone is a common mental image of a volcano. Mount Fuji in Japan and Mayon Volcano in the Philippines are some examples of this ideal shape. In reality, volcanoes can have different shapes. Below are the most common types.

Composite volcanoes – Composite volcanoes are made up of alternating layers of cinder, ash and lava. Because of these alternating strata, these volcanoes are also called stratovolcanoes. Stratovolcanoes have steeply sloping, symmetrical cones. Some of the most beautiful mountains in the world are composite volcanoes, including Mount Fuji in Japan, and Mount St. Helens in Washington.



Shield Volcanoes – When mild, non-explosive eruptions of lava occur, gently sloping, wide, flat top volcanoes or shield volcanoes are formed. Kilauea in Hawaii and Olympus Mons on Mars are shield volcanoes.

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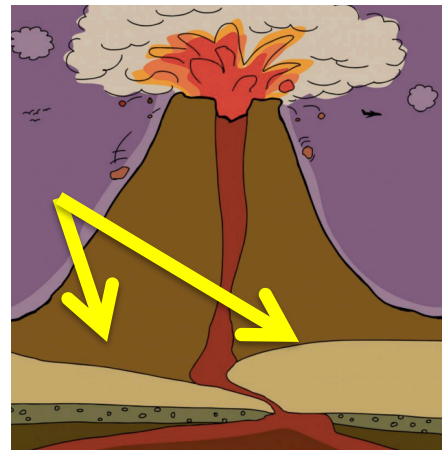


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Volcano History and Formation

The volcano that gave its name to volcanoes, as a general term, is a stratovolcano located west of Italy in the Lipari Islands known as Vulcano. Aristotle and Thucydides mention eruptions of the Volcano in the fourth and fifth centuries B.C

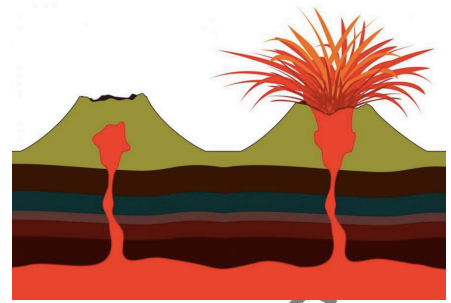
A volcano forms at the edges of the tectonic plates, which are large, movable segments of the Earth's crust. These puzzle-like pieces move unnoticeably (a few inches) every year. Magma travels atop the molten mantle, the layer beneath the crust. Molten magma builds up at the Earth's surface, which then forms the shape of the volcano. This can happen over a period of weeks or millions of years. (Nationalgeographic.org, 2016)



How a volcano works

When speaking of volcanoes, one thing may come to mind—destruction. Some erupt violently, destroying living and nonliving things quickly and without mercy, while others emit gas or lava slowly. The severity of the eruption depends on the magma's composition.

Magma (with dissolved gases in it) flows upwards when the internal gas pressure below builds high enough. The gases are kept in this dissolved state as long as the confining pressure of the surrounding rock is greater than the vapor pressure of the gas. When the vapor pressure becomes greater than the confining pressure, the dissolved gas expands and forms small gas bubbles, called vesicles. This happens when the confining pressure decreases or when the magma cools. As the pressure increases, tiny gas bubbles and magma spew out. The same thing happens when opening a bottle of soda after shaking it up (howstuffworks.com, 2001).

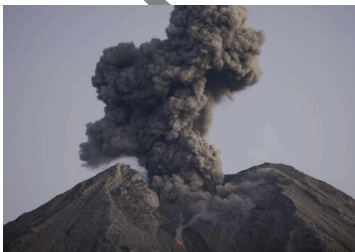


Environmental impacts of volcanoes

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Ash clouds can affect climate as shown by the eruptions of Krakatoa (Krakatau) near Java in 1883, Mount Agung in Bali in 1963, and Pinatubo in Philippines in 1991. The high ash clouds thrown up by these volcanic eruptions lowered the average world temperature by about 0.5 °C (0.9 °F) over one to three years following their eruptions.

Not all volcanic phenomena are destructive. The oceans, atmosphere, and continents were formed by volcanic eruptions throughout time. Lava may bury the land, but it can also bring life. Volcanic ash slowly breaks down to form rich soils where plants can thrive and where animals can eventually come to live.

Hot springs and geysers also are manifestations of volcanic activity. They result from the interaction of groundwater with magma at shallow depths (Britannica.com, 2015).



Reading Comprehension Questions:

1. What is a volcano?
2. What
3. Describe composite volcanoes.
4. How do
5. How is a volcanic eruption like shaking up a soda bottle?
6. Why are
7. How could ash clouds lower the average temperature of the world?
8. How

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