

WHAT IS A VOLCANO ?

The word volcano is used to describe either a kind of mountain built up of volcanic rock or vent that pours out gas, molten rock and volcanic ash. The vent is the conduit that extends from the Earth's upper mantle or lithosphere to the surface. Volcanoes are built by the accumulation of their own eruptive products: lava bombs, lava flows, pyroclastic flows and tephra. Driven by buoyancy and gas pressure, the molten rock, which is lighter than the surrounding solid rock, forces its way upward and may break through zones of weaknesses in the Earth's crust. Most of the material is deposited close to the vent, but some is carried high into the atmosphere to be spread by winds hundreds or thousands of kilometers from the source.

Most of world's active volcanoes are located along or close the boundaries between shifting plates: spreading zones and converging zones. Along the mid-ocean ridges (spreading zones), the plates are moving apart and new crust is being formed; along subduction zones, plates collide and one plate is subducted beneath the other. However, some others active volcanoes are not associated with these boundaries but these volcanoes form roughly linear chains in the interior of some oceanic plates or sometimes in continental plates (intra-plate volcanoes). These hot spot volcanoes may be caused by slow-moving plumes of hot plastic rock deep within the Earth that help propel the plates.

Volcanoes can grow into all shapes and sizes from high spectacular cones to deep craters. They often change shape during their lifetime which can vary greatly from some hours to several thousand or million years. Volcanologist generally group volcanoes into four main kinds: cinder cones, lava domes, stratovolcanoes, shield volcanoes. Following the emptying of a magma chamber, the summit of a stratovolcano or a shield volcano may collapse to form a caldera. The morphology of a volcano depends on the eruptive processes which are largely governed by the chemical composition and volatile content of the magma. For instance, the higher magma's silica content the greater its viscosity. Highly liquid, basaltic lava builds shallow, broad shield volcanoes, whereas stratocones are formed by explosive and effusive activity of more viscous magma.

An active volcano is one that is erupting or has erupted recently. The International Association of Volcanology (IAVCEI) defines a potentially active volcano as one that has erupted during the past 10.000 years. In using the 10.000-year time span, the number of active volcanoes in the world is more than 1500. The longer a volcano has been inactive, the greater, usually, the volume of the ejected masses and the more explosive the eruption. Long period of dormancy between eruptions are characteristic for many volcanoes in the world.

During an episode of activity, a volcano can display a distinctive pattern of behavior. Some mild eruptions merely discharge steam and other gases, whereas other eruptions quietly extrude quantities of lava. The most spectacular eruptions consist of violent explosions that blast great clouds of gas-laden debris into the atmosphere. The type of volcanic eruption is often labeled with the name of a well-know volcano in the world where characteristic behavior is similar: strombolian, vulcanian, vesuvian (also named plinian), pelean, hawaiian and others. However, some volcanoes may display only one characteristic type of eruption during an interval of activity, but some others may display an entire sequence of types. If magma encounters groundwater during its ascent toward the Earth's surface, an explosion-like vaporization of the water can occur (phreatic eruption when only wall rocks is fragmented; phreato-magmatic when new magma is involved). Such eruptions are often accompanied by base surges, currents of large destructive power which consist of gases and fragmented rock flowing horizontally away from the eruption center.

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