**Extrusive volcanism – a summary**

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| **Landform / structure** | **Description** | **Process /notes** |
| **Volcano** | A **volcano** is an opening, or rupture, in a planet's surface or crust, which allows hot magma, ash and gases to escape from below the surface. The word *volcano* is derived from the name of Vulcano island off Sicily which in turn, was named after Vulcan, the Roman god of fire. Volcanoes are generally found where tectonic plates are diverging or converging. A mid-oceanic ridge, for example the Mid-Atlantic Ridge, has examples of volcanoes caused by divergent tectonic plates pulling apart; the Pacific Ring of Fire has examples of volcanoes caused by convergent tectonic plates coming together. By contrast, volcanoes are usually not created where two tectonic plates slide past one another. Volcanoes can also form where there is stretching and thinning of the Earth's crust (called "non-hotspot intraplate volcanism"), such as in the African Rift Valley, the Wells Gray-Clearwater volcanic field and the Rio Grande Rift in North America and the European Rhine Graben with its Eifel volcanoes. Volcanoes can be caused by mantle plumes. These so-called hotspots, for example at Hawaii, can occur far from plate boundaries. |  |
| **Pyroclastic flow** | A **pyroclastic flow** (also known scientifically as a **pyroclastic density current** is a common and devastating result of certain explosive volcanic eruptions. The flows are fast-moving currents of hot gas and rock (collectively known as tephra), which travel away from the volcano at speeds generally as great as 700 km/h (450 mi/h).The gas can reach temperatures of about 1,000 °C. The flows normally hug the ground and travel downhill, or spread laterally under gravity. Their speed depends upon the density of the current, the volcanic output rate, and the gradient of the slope. |  |
| **Lava flow** | **Lava** is molten rock expelled by a volcano during an eruption. This molten rock is formed in the interior of some planets, including Earth, and some of their satellites. When first erupted from a volcanic vent, lava is a liquid at temperatures from 700 °C to 1,200 °C. Up to 100,000 times as viscous as water, lava can flow great distances before cooling and solidifying |
| **Volcanic cones** | **Volcanic cones** are among the simplest volcanic formations in the world. They are built by ejecta from a volcanic vent, piling up around the vent in the shape of a cone with a central crater. Volcanic cones are of different types, depending upon the nature and size of the fragments ejected during the eruption. Types typically differentiated are spatter cones, ash cones, tuff cones, and cinder ones. |
| **Fissure vent** | A **fissure vent**, also known as a **volcanic fissure** or simply **fissure**, is a linear volcanic vent through which lava erupts, usually without any explosive activity. The vent is usually a few meters wide and may be many kilometres long. Fissure vents can cause large flood basalts and lava channels. This type of volcano is usually hard to recognize from the ground and from outer space because it has no central caldera and the surface is mostly flat. The volcano can usually be seen as a crack in the ground or on the ocean floor. |  |
| **Spatter cones** | A spatter cone is formed of molten lava ejected from a vent somewhat like taffy. Expanding gases in the lava fountains tear the liquid rock into irregular gobs that fall back to earth, forming a heap around the vent. The still partly liquid rock splashes down and over the sides of the developing mound is called *spatter*. Because spatter is not fully solid when it lands, the individual deposits are very irregular in shape and weld together as they cool, and in this way particularly differ from cinder and ash. Spatter cones are typical of volcanoes with highly fluid magma, such as those found in the Hawaiian Islands. |
| **Ash cones**  **Tuff cones** | An ash cone is composed of particles of silt to sand size. Explosive eruptions from a vent where the magma is interacting with groundwater or the sea (as in an eruption off the coast) produce steam and are called *phreatic*. The interaction between the magma, expanding steam, and volcanic gases results in the ejection of mostly small particles called *ash*. Fallen ash has the consistency of flour. The unconsolidated ash forms an *ash cone* that becomes a *tuff cone* or *tuff ring* once the ash consolidates (see also tuff). Flat-floored craters that scientists interpret have formed above diatremes as a result of a violent expansion of magmatic gas or steam; deep erosion of a maar presumably would expose a diatreme. |
| **Cinder cones** | A cinder cone is a volcanic cone built almost entirely of loose volcanic fragments called cinders (pumice, pyroclastics, or tephra). They are built from particles and blobs of congealed lava ejected from a single vent. As the gas-charged lava is blown violently into the air, it breaks into small fragments that solidify and fall as cinders around the vent to form a circular or oval cone. Most cinder cones have a bowl-shaped crater at the summit.  Cinder cones rarely rise more than 300 to 750 m or so above their surroundings, and, being unconsolidated, tend to erode rapidly unless further eruptions occur. Cinder cones are numerous in western North America as well as throughout other volcanic terrains of the world. Parícutin, the Mexican cinder cone which was born in a cornfield on February 20, 1943, and Sunset Crater in Arizona in the US are classic examples of cinder cones. |
| **Lava plateaus** | Lava plateaus are formed by highly fluid (runny) basaltic lava during numerous successive eruptions through numerous vents without violent explosions (quiet eruptions). These eruptions are quiet because of low viscosity of mafic lava, so that it is very fluid and contains small amount of trapped gases. The resulting sheet lava flows may be extruded from linear fissures or rifts or gigantic volcanic eruptions through multiple vents characteristic of the prehistoric era that produced giant flood basalts. Multiple successive and extensive lava flows cover the original landscape to eventually form a plateau, which may contain lava fields, cinder cones, shield volcanoes and other volcanic landforms. |  |
| **Flood basalts** | A **flood basalt** or **trap basalt** is the result of a giant volcanic eruption or series of eruptions that coats large stretches of land or the ocean floor with basalt lava. Flood basalts have occurred on continental scales (large igneous provinces) in prehistory, creating great plateaus and mountain ranges. Flood basalts have erupted at random intervals throughout geological history and are clear evidence that the Earth undergoes periods of enhanced activity rather than being in a uniform steady state. One explanation for flood basalts is that they are caused by the combination of continental rifting and its associated decompression melting, in conjunction with a mantle plume also undergoing decompression melting, producing vast quantities of a tholeiitic basaltic magma. These have a very low viscosity, which is why they 'flood' rather than form taller volcanoes. |  |
| **Shield or basaltic volcano** | A **shield volcano** is a volcano with shallow-sloping sides. Shield volcanoes normally form from fluid lava flows that can travel long distances across slight inclines, resulting in their relatively flat, broad profile. Some of the largest volcanoes on Earth are shield volcanoes. Shield volcanoes are formed by lava flows of low viscosity.Consequently, a volcanic mountain having a broad profile is built up over time by flow after flow of relatively fluid basaltic lava issuing from vents or fissures on the surface of the volcano. The largest in terms of area covered is Mauna Loa of Hawaii; the tallest measured from its base under the ocean, however, is Mauna Kea of Hawai'i. All the volcanoes in the Hawaiian Islands are shield volcanoes. Many shield volcanoes have a collapsed caldera. |  |
| **Composite (strato) or andesitic**  **volcano** | A **stratovolcano**, sometimes called a **composite volcano** is a tall, conical volcano with many layers (strata) of hardened lava, tephra, and volcanic ash. Stratovolcanoes are characterized by a steep profile and periodic, explosive eruptions. The lava that flows from stratovolcanoes tends to be viscous; it cools and hardens before spreading far. The magma forming this lava is often felsic, having high-to-intermediate levels of silica (as in rhyolite dacite, or andesite), with lesser amounts of less-viscous mafic magma. Stratovolcanoes are sometimes called "composite volcanoes" because of their composite layered structure built up from sequential outpourings of eruptive materials, alternating between lava and ash. They are among the most common types of volcanoes, in contrast to the less common shield volcanoes. A famous stratovolcano is Krakatoa, best known for the eruption in 1883. |  |
| **Caldera** | A **caldera** is a cauldron-like volcanic feature usually formed by the collapse of land following a volcanic eruption such as the ones at Yellowstone National Park in the US and Glen Coe in Scotland. They are sometimes confused with volcanic craters. The word comes from Spanish *caldera*, and this from Latin CALDARIA, meaning "cooking pot". In some texts the English term *cauldron* is also used. Calderas are formed out of stratovolcanoes. In 1815, the German geologist Leopold von Buch visited the Las Cañadas Caldera Teide, Tenerife and the Caldera de Taburiente, La Palma, both in the Canary Islands. When he published his memoirs he introduced the term "caldera" into the geological vocabulary. A collapse is triggered by the emptying of the magma chamber beneath the volcano, usually as the result of a large volcanic eruption. If enough magma is ejected, the emptied chamber is unable to support the weight of the *volcanic edifice* above it. A roughly circular fracture - the "Ring Fault" develops around the edge of the chamber. These *ring fractures* serve as feeders for fault intrusions which are also known as ring dykes. Secondary volcanic vents may form above the ring fracture. As the magma chamber empties, the center of the volcano within the ring fracture begins to collapse. The collapse may occur as the result of a single cataclysmic eruption, or it may occur in stages as the result of a series of eruptions. The total area that collapses may be hundreds or thousands of square kilometers. |  |