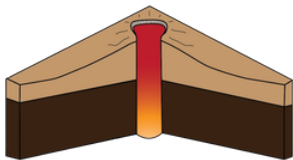


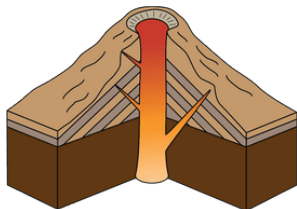
Volcanoes Types

There are several different types of volcanoes, we have included 4 main types in our volcano case studies. One way of determining the type of volcano is to look at the lava viscosity, lava can be highly viscous (thick and sticky) or runny with low viscosity. Different types of volcanoes produce eruptions of different intensities; we measure this using the Volcanic Explosivity Index (VEI) which is a logarithmic scale from 0-8, with each value being 10 times greater than the last.



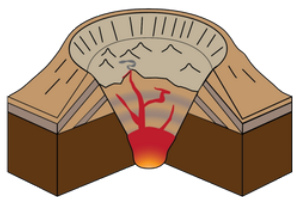
Shield

Low viscosity, runny lava can travel large distances, forming gentle sloped volcanoes called shield volcanoes. An example of this is Mauna Loa, one of the world's oldest active volcanoes, that rises 9km from the seafloor, which with other volcanoes creates the islands of Hawai'i. Shield volcanoes usually have gentle effusive eruptions (VEI 0) where basaltic lava flows out and cools to form basalt rock.



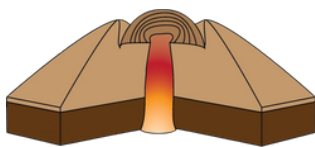
Stratovolcano

Stratovolcanoes are usually large volcanoes with steep sides created out of layers of lava flows, volcanic ash and debris. The gas build up in the viscous lava is more likely to produce explosive eruptions. An example is Nyiragongo in the Democratic Republic of the Congo which had a VEI 2 eruption in 2021.



Caldera

When a magma chamber under a stratovolcano is violently emptied in an explosive eruption, the rock above can collapse into the magma chamber and in some cases the summit of a volcano can be blown off! This creates a steep sided bowl called a caldera that can be anywhere between 1 to 30 miles wide. An example is Chaitén in Chile.



Lava Domes

Lava domes are formed when very thick, viscous lava cannot flow far and instead builds up in a pile around the vent, forming a large dome shaped mass called a lava dome. Lava domes are usually characterised by effusive (gentle) eruptions but if disturbed the trapped gases can be released quickly in an explosive eruption. At the summit of the Soufrière Hills volcano are several lava domes.

GLOSSARY

Basaltic lava:

Dark and low viscosity lava produced by melting the Earth's mantle.

Effusive eruption:

Outpouring of lava, gentle in contrast to explosive eruptions.

Explosive eruption:

Energetic eruption producing ash, pumice and debris.

VEI:

Volcanic Explosivity Index measures the explosiveness of eruptions.

Vent:

An opening in the Earth's surface through which magma erupts.

Viscous lava:

Thick, sticky consistency that does not flow easily.

[British Geological Survey](#) | [Volcanoes USGS](#) | [NPS.GOV](#)

Volcano Case Study: Nyiragongo

Elevation:	3470m
Volcano type:	Stratovolcano
Tectonic Setting	Rift Valley
Volcanic Explosivity Index:	5 (VEI range 0-8)
Most recent eruption:	2025



Eruption History

Located in the East African Rift Valley, Nyiragongo is one of the world's most active volcanoes. A significant eruption occurred in 1977 when the lava lake at the summit drained and flowed out, resulting in deaths in the nearby city of Goma. Another eruption in 2002 began with no warning and the large lava flow destroyed homes, infrastructure and the city's airport, with 100 deaths.



Located in DR Congo

1

Volcano explained

Mount Nyiragongo has the largest lake of lava in the world, which is always bubbling within its summit crater. Nyiragongo was formed through tectonic plate movement along the East African Rift. This is a constructive plate boundary, where two tectonic plates move apart and the movement creates openings in the Earth's crust allowing magma to rise to the surface.



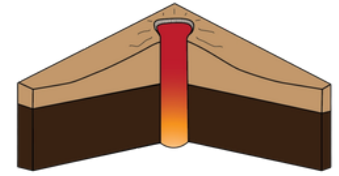
2

Sources consulted:
volcanoes.usgs.gov
Volcanodiscovery.com
[Global Volcanism Program](#)

Graphics sourced from:
1. [Britannica](#)
2. www.peakvisor.com

Volcano Case Study: Mauna Loa

Elevation:	4170m
Volcano Type:	Shield
Tectonic Setting:	Hotspot
Volcanic Explosivity Index:	0 (VEI range 0-8)
Most recent eruption:	2022



Shield

Eruption History

Mauna Loa is a massive shield volcano that rises 9 km from the ocean floor making it the world's largest active volcano.

Mauna Loa is very active and erupted most recently in November-December 2022 and has erupted 34 times since its first well-documented eruption in 1843. It has produced large flows of lava that have reached the ocean eight times since 1868.



Located in Hawai'i

1

Volcano explained

This shield volcano is part of a chain of volcanoes that make up the Hawaiian islands. Shield volcanoes are not typically explosive but instead produce basaltic magma, which is low viscosity and high in temperature. Shield volcanoes have gentle sides as the lava flows for long distances before it solidifies. They also have short periods of time between eruptions.



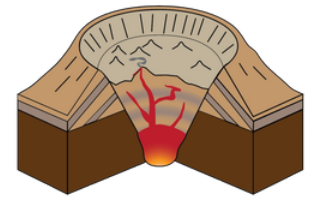
2

Sources consulted:
volcanoes.usgs.gov
Volcanodiscovery.com
[Global Volcanism Program](https://GlobalVolcanismProgram.org)

Graphics sourced from:
1. [Britannica](https://Britannica.com)
2. www.volcanotours.com

Volcano Case Study: Chaitén

Elevation:	1122m
Volcano Type:	Caldera
Tectonic Setting:	Subduction Zone
Volcanic Explosivity Index:	4-5 (VEI range 0-8)
Most recent eruption:	2011



Caldera

Eruption History

Chaitén is a caldera volcano located in Chile, it has explosively erupted several times throughout human history. In 2008 it started erupting for the first time in 9,400 years and this eruption lasted 6 months. The ash cloud from the eruption spread across Chile and towards Argentina, with an ash plume height of 30 km and dispersed ash over more than 200,000 km² of Chile and Argentina.



1

Located in Chile, South America

Volcano explained

A caldera is a depression formed when a volcano erupts and collapses. Chaitén is a small caldera (~3 km in diameter). When the magma is removed from the chamber below, it no longer supports the rock above, leading to the ground collapsing in on itself. An example of a large Caldera is Yellowstone Caldera which is 60km wide.



2

Sources consulted:
volcanoes.usgs.gov
Volcanodiscovery.com
[Global Volcanism Program](http://GlobalVolcanismProgram)

Graphics sourced from:

1. Britannica
2. volcanoes.usgs.gov

Volcano Case Study: Mount Etna

Elevation:	3357m
Volcano Type:	Stratovolcano
Tectonic Setting:	Destructive plate boundary
Volcanic Explosivity Index:	3 (VEI range 0-8)
Most recent eruption:	2025



Eruption History

Mount Etna has the longest recorded history of eruptions, dating back to 1500 BCE.

The most powerful recorded eruption was in 1969, when explosions destroyed part of the summit and lava flows reached the city of Catania, more than ten miles away.

Etna's longest eruption began in 1979 and went on for thirteen years.



Located on the island of Sicily, Italy



Volcano explained

Mount Etna is a stratovolcano. These are most commonly type found on destructive plate margins, where the more dense plate sinks beneath the less dense plate.

These volcanoes have viscous (sticky) lava, that result in violent explosive eruptions.

Sources consulted:

[Geology.com](https://www.geology.com)

[Volcanodiscovery.com](https://www.volcanodiscovery.com)

[Global Volcanism Program | Etna](#)

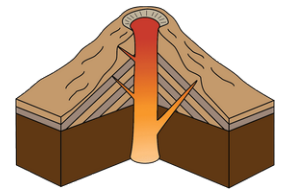
Graphics sourced from:

1. [Britannica](#)

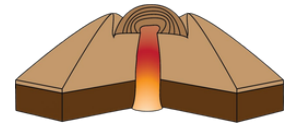
2. [Mount Etna | StewartBrenden](#)

Volcano Case Study: Soufrière Hills

Elevation:	915 m
Volcano Type:	Stratovolcano, Lava Domes
Tectonic Setting:	Destructive plate boundary
Volcanic Explosivity Index:	3 (VEI range 0-8)
Most recent eruption:	2013



Stratovolcano



Lava Domes

Eruption History

In the past 10,000 years, Soufrière Hills erupted at least 9 times. People first settled on the island of Montserrat in 1632 and the volcano lay dormant until a large eruption in 1995. The pyroclastic flows from this eruption forced the southern half of the island to evacuate and destroyed the capital city of Plymouth. Volcanic activity was then recorded every year from 1995 to 2013.



1

Located on the island of Montserrat, in the Caribbean

Volcano explained

Soufrière Hills volcano is caused by tectonic activity around the Caribbean plate and is well known for the lava domes at the summit of the volcano. Explosive eruptions from the volcano produced large plumes of fine ash, and pyroclastic flows. A pyroclastic flow is a collection of hot gases, volcanic ash and solidified lava pieces that move very quickly.

Graphics sourced from:

1. [Britannica](#)

2. [www.photovolcanica.com](#)



2

Sources consulted:
[volcanoes.usgs.gov](#)
[Volcanodiscovery.com](#)
[Global Volcanism Program](#)