

Fire-land

Iceland is made almost entirely of volcanic rocks like those found on the deep ocean floor. It has gradually built up above sea level through intense and prolonged eruptions.



Moving plates

Most volcanoes are found at plate boundaries, where melting rock forms columns of magma that erupt at the surface. When two plates move apart, a chain of gentle volcanoes, known as a spreading ridge, is formed. Where plates collide, one is forced beneath the other, forming a subduction zone. The sinking plate partly melts and the hot, liquid magma rises. A third kind of volcano erupts above a hot spot, a place where rising magma burns through the Earth's crust.



Volcano chain

Guatemala in Central America is home to a chain of volcanoes, many still active. They sit on top of a subduction zone, formed as the Cocos Plate sinks beneath the larger North American Plate.



America's fault

The San Andreas fault is probably the most famous plate boundary in the world. The plates, which constantly slide against each other, move about 1 cm (0.4 in) a year.

A deep ocean trench is formed where the ocean floor descends in a subduction zone

Continental boundary lifted above subduction zone

Ocean floor is older the farther it is from the ridge

Rift (crack) where ocean floor is pulled apart

Old volcanoes that have moved away from hot spot

Hot-spot volcano, builds up a mountain so large it forms an island

50 km (31 miles)

100 km (62 miles)

Magma erupts in the rift as pulled-apart plates release pressure

Hot plume of magma rises to form a hot spot

The new plate cools and thickens as it moves away from the heat of the ridge

Ocean plate heated as it plunges into the mantle

Lightest melted rock rises through the surrounding dense rocks

Magma reservoir feeds volcano

Lithosphere (crust and very top of mantle)

Asthenosphere (soft, upper part of mantle)

Spreading ridges

New ocean floor is made where plates are pulled apart (pp. 24–25), creating a rift (crack in the Earth's crust). Here, magma erupts as lava, creating new rock. All the ocean floor has been made this way in the last 200 million years.

Hot spots

Hot spots (pp. 22–23) are areas in the middle of a tectonic plate, where columns of magma from the mantle rise to the surface and punch a hole in the plate, forming a volcano.

Subduction zone

Where one plate is pushed below another, it sinks into the mantle, partly melting some rocks to form magma. This magma erupts at the surface through volcanoes.

Transcurrent plate margin

Where two plates meet at an odd angle, a boundary called a transcurrent plate margin is formed.

There are few volcanoes along transcurrent plate margins