

Plate tectonics

Earth's surface may seem fixed but in fact is made up of lots of huge slabs called tectonic plates. These plates move slowly but constantly, and movements between them create earthquakes and volcanoes.

Most tectonic plates carry both oceans and continents, though a few are almost entirely oceanic. Where two plates pull apart under an ocean, new ocean floor is formed. Where plates are pushed together, dramatic changes to the landscape can occur. If both edges are continental, a huge mountain range will form in the collision zone. If one plate is oceanic and the other continental, the oceanic edge will usually be pushed under its neighbor. Fiery volcanoes occur along the edges of these boundaries, which are called subduction zones.

Earth's plates

The top layer of Earth is like a jigsaw, with seven or eight large plates and dozens of smaller, more fragmented plates. These plates float around, moving on top of the hotter layers below. Their slow, steady movement can change the size of the oceans, and carry continents around the globe.

Key

1 Pacific	20 North Andes
2 North American	21 Altiplano
3 Eurasian	22 Anatolian
4 African (Nubian)	23 Banda
5 African (Somalian)	24 Burma
6 Antarctic	25 Okinawa
7 Australian	26 Woodlark
8 South American	27 Mariana
9 Nazca	28 New Hebrides
10 Indian	29 Aegean
11 Sunda	30 Timor
12 Philippine	31 Bird's Head
13 Arabian	32 North Bismarck
14 Okhotsk	33 South Sandwich
15 Caribbean	34 South Shetland
16 Cocos	35 Panama
17 Yangtze	36 South Bismarck
18 Scotia	37 Maoke
19 Caroline	38 Solomon

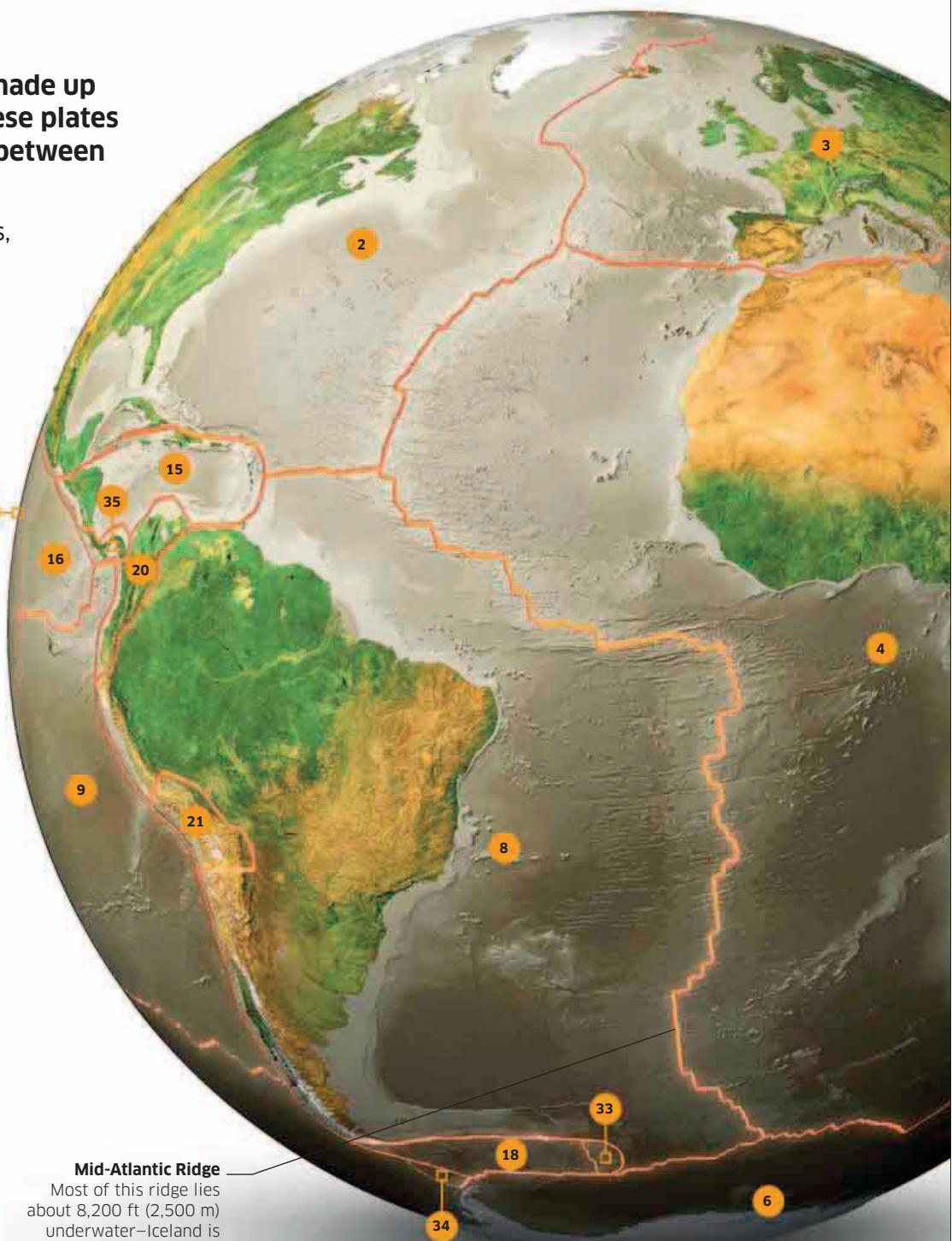
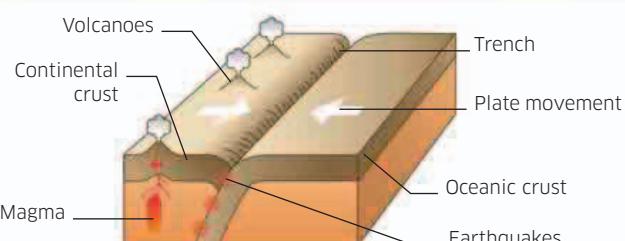


Plate boundaries

The edges of tectonic plates meet up in different ways. The plates move apart, toward each other, or past each other. Earthquakes can occur in any of these circumstances, and studying earthquakes can help us work out where plate boundaries lie. Sometimes there are so many cracks that it is impossible to tell exactly where one plate ends and the next one begins.



Convergent

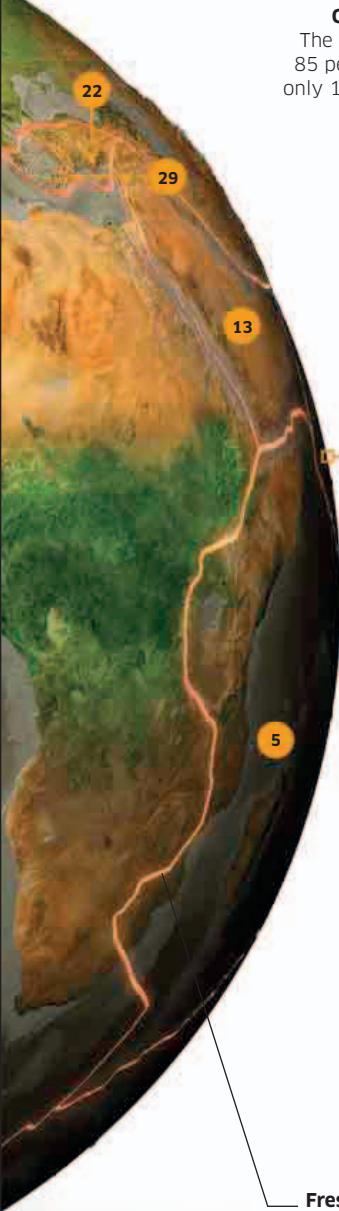
Where a plate with oceanic crust moves toward a plate with thicker, continental crust, it will be pushed down, or subducted. The oceanic plate then melts, and can create volcanoes as magma bubbles up to the surface. If two continents collide, they will push up against each other, creating mountain ranges.

40,000 miles (65,000 km)—the length of the **underwater mountain chains** formed by mid-ocean ridges.

55 million years ago, the **Indian and Asian plates** crashed together, creating the **Himalayas**.

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0.75 in (2 cm) per year—the speed of seafloor spreading in the north Atlantic Ocean.



Continental plate

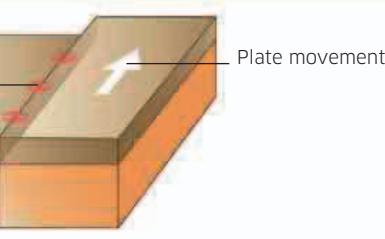
The Eurasian plate is 85 percent land, with only 15 percent water.

Fresh break

This new rift is causing the African plate to slowly split down the middle, creating two new plates—Nubian and Somalian.

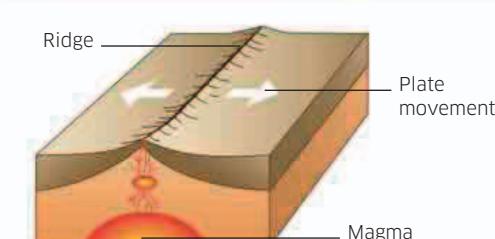
The Challenger Deep

This is the deepest known point on Earth, at 35,800 ft (10,911 m) below sea level.



Transform

When plates slide past each other, they create a transform boundary. Movement at these plate edges is not smooth and gradual—it is very jerky, and earthquakes occur when a sudden shift releases huge amounts of energy. Volcanoes are rare at these boundaries, because little or no magma is created.



Divergent

Where plates pull apart, they create a divergent boundary. When this happens under oceans, rock from the mantle is drawn up into the gap and some of it melts as it rises, creating new oceanic crust. As new crust is formed, other parts of crust are destroyed at convergent boundaries—so Earth stays the same size.