

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 |

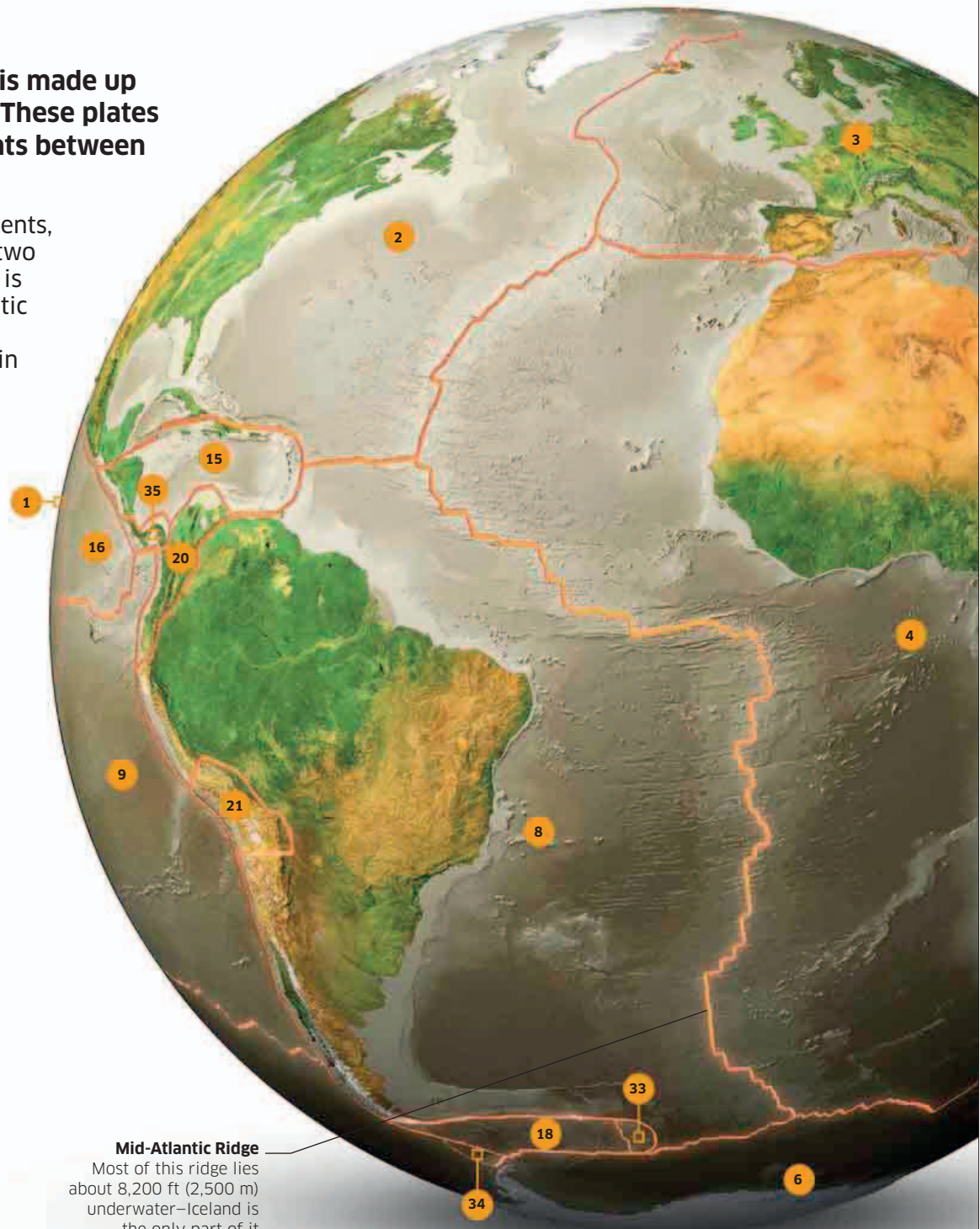
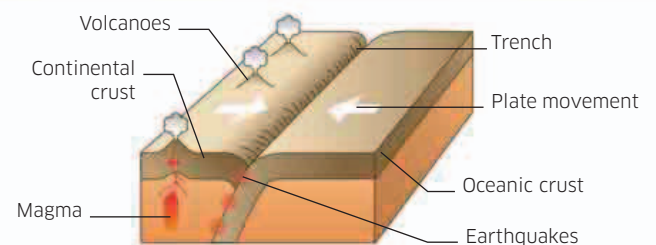


Plate boundaries

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.

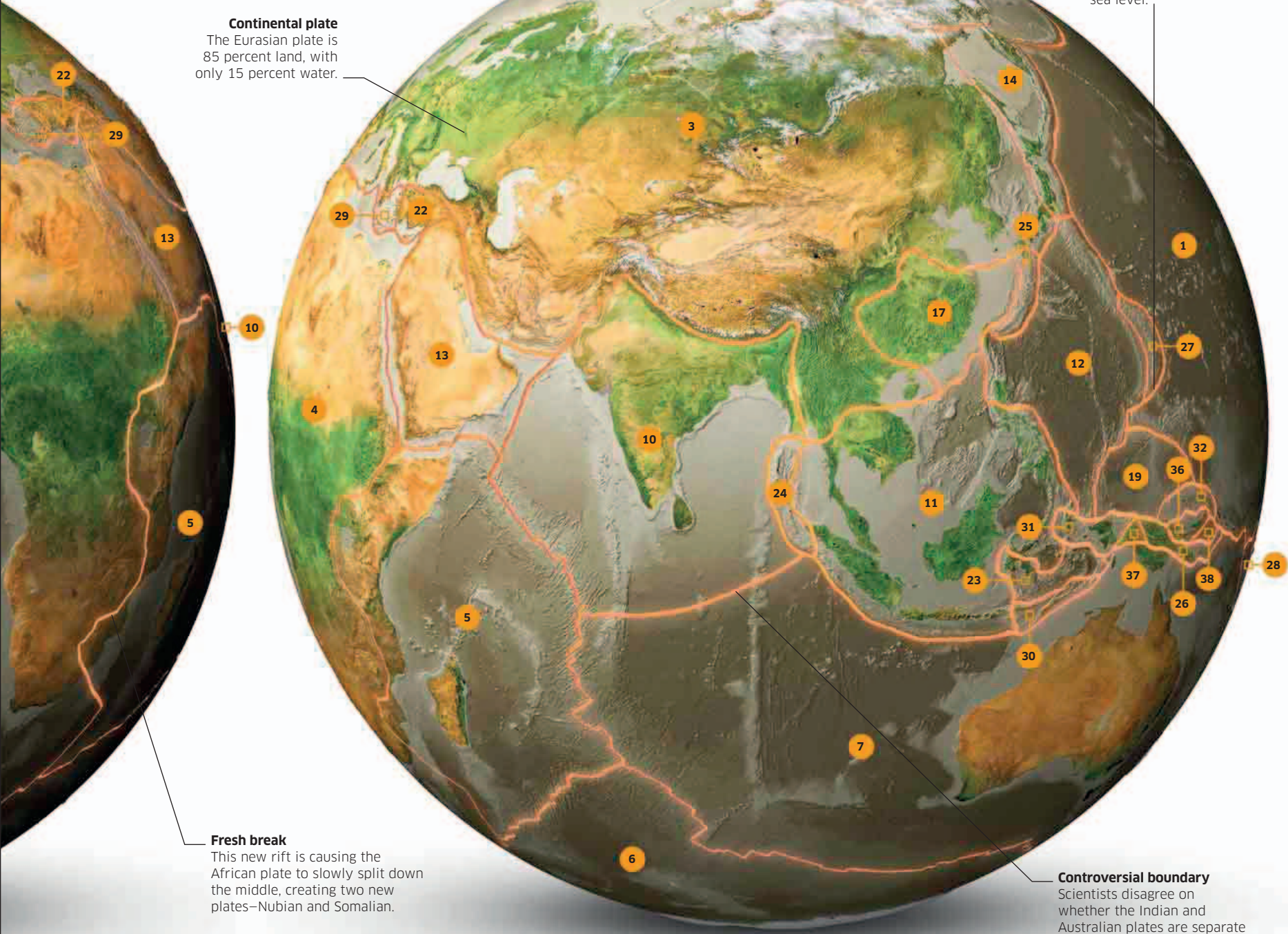


Convergent

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.

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

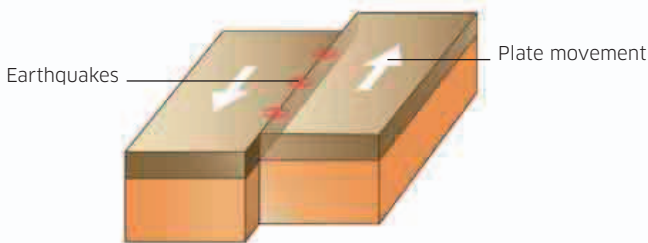
The Challenger Deep
This is the deepest known point on Earth, at 35,800 ft (10,911 m) below sea level.



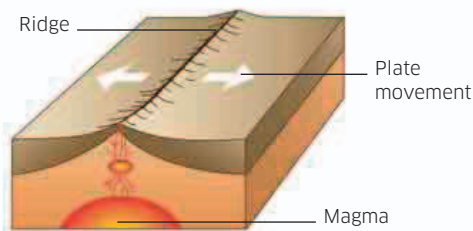
Continental plate
The Eurasian plate is 85 percent land, with only 15 percent water.

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

Controversial boundary
Scientists disagree on whether the Indian and Australian plates are separate—some think they are a huge, single, Indo-Australian plate.



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.