

# Inside the Earth

We can't explore much of the Earth—our deepest mines only travel about a mile into the crust. However, there are scientific ways to find out what it is like inside.

Geologists are able to study rocks from all depths within the Earth's crust, because collisions between continents push up rock that used to be below the surface, forming mountains. In some areas, collisions have even unearthed vast swathes of the mantle. Volcanoes also sometimes erupt lumps of rock from the mantle. Under the mantle is the core, which has never been seen at the surface. However, scientists have used the waves from earthquakes to work out that the core is split into two layers—a liquid outer core and a solid inner core.



## Volcanoes in Hawaii

The Hawaiian islands in the mid-Pacific have been built by volcanic eruptions. The rock that formed them was pushed to the Earth's surface by hot rock moving upward in the mantle.

### Rifting

Two tectonic plates pull away from each other, and new land is created between them.

### Oceanic crust

Thinner and denser than the continental crust.

# 9,900°F

(5,400°C) – the approximate temperature of Earth's inner core.

## Layered Earth

Earth is made up of many rocky layers. The top layer is the crust. Below that, uniform and slightly denser rock forms the mantle. The crust and the top of the mantle form a single rigid layer together, which is called the lithosphere. This is broken into sections called tectonic plates. Below the lithosphere is the asthenosphere. Only tiny parts of the asthenosphere are liquid, but it is soft enough to move, pushing around the plates above. Under the mantle lies the core. The outer core is a liquid mix of iron and sulfur, while the inner core is solid iron and nickel.

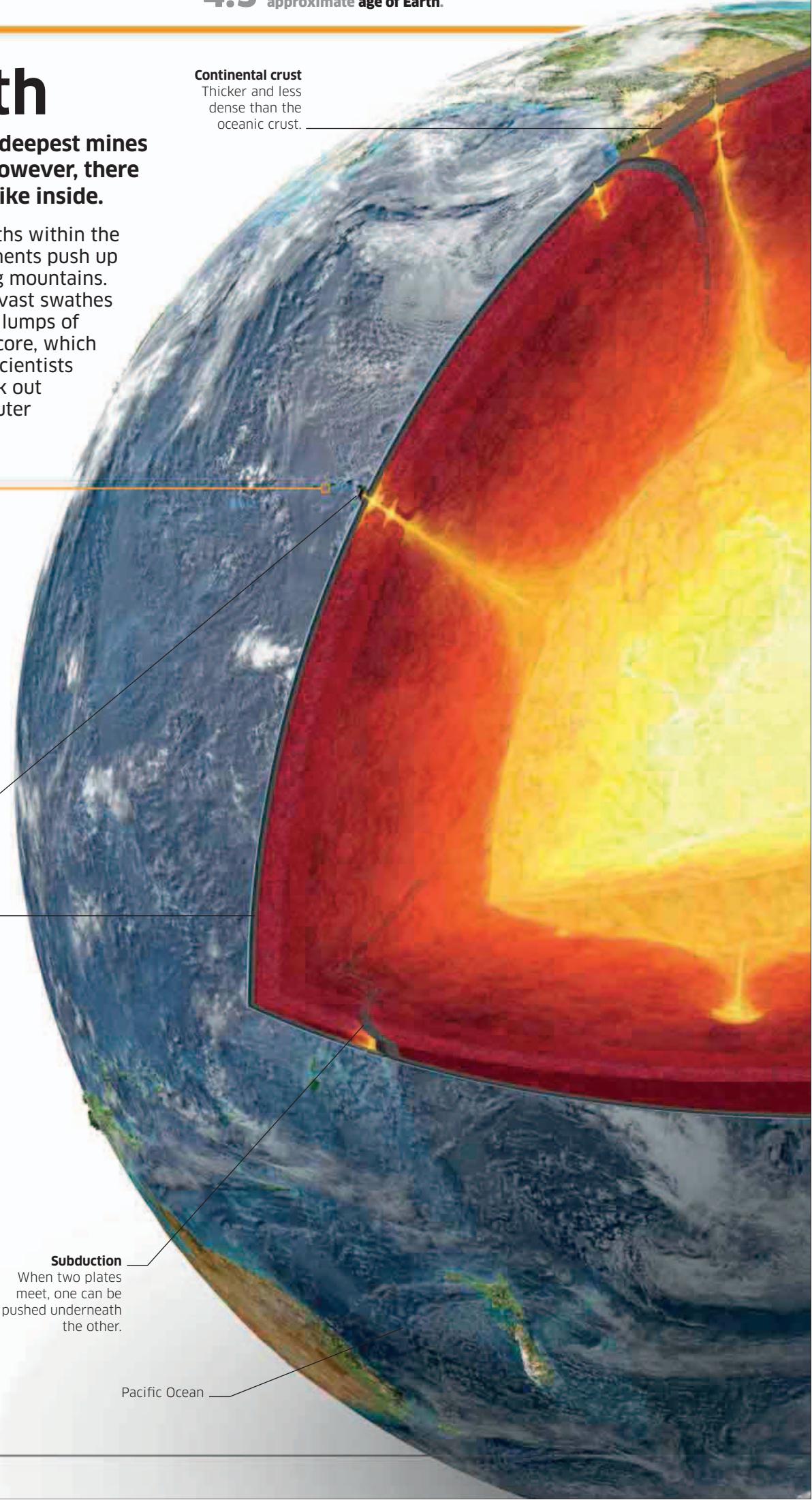
### Continental crust

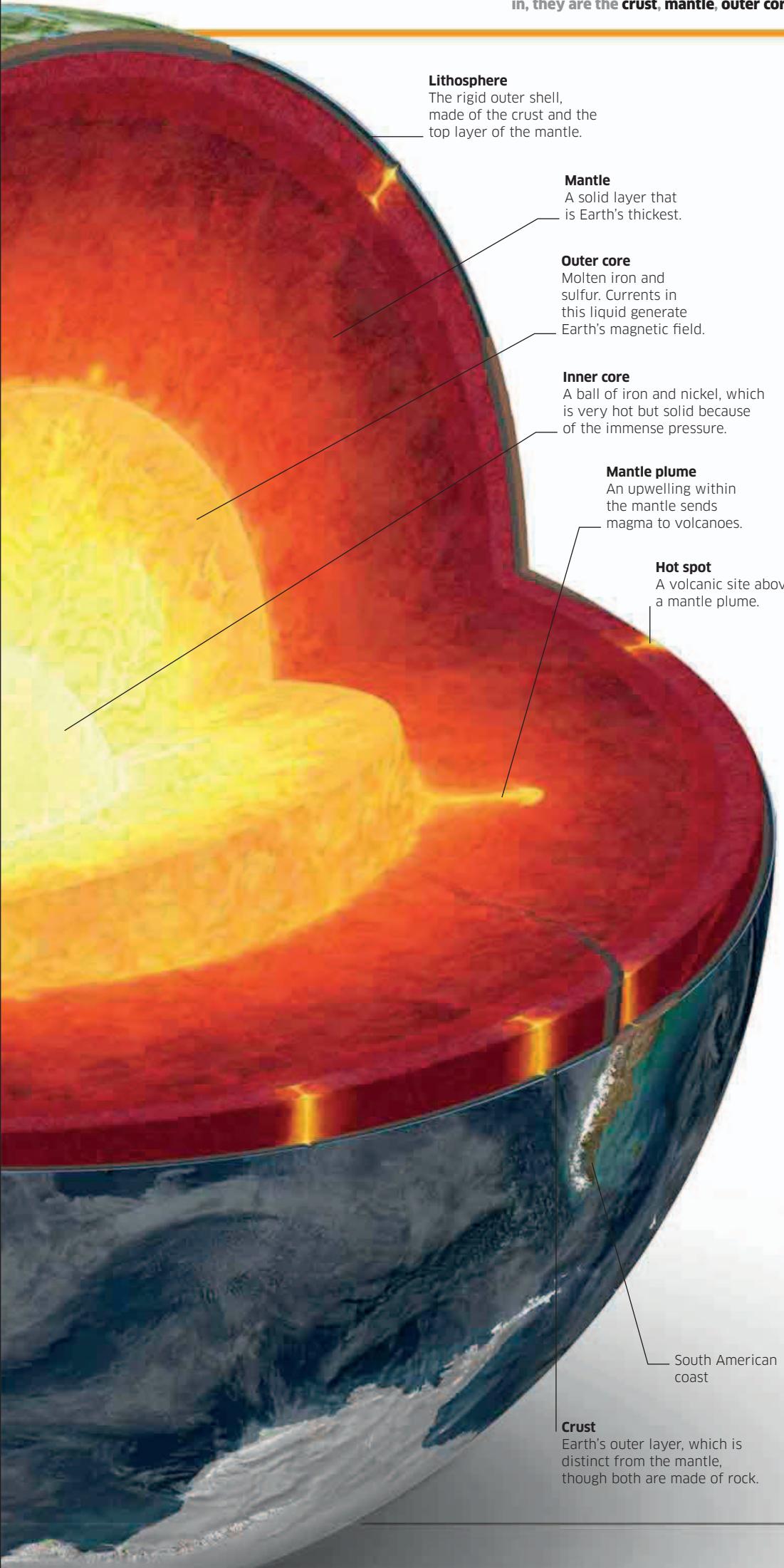
Thicker and less dense than the oceanic crust.

### Subduction

When two plates meet, one can be pushed underneath the other.

### Pacific Ocean





## The atmosphere

Earth's atmosphere is made up of gases, which are held in place by gravity. There is no clear boundary to the outer edge of the atmosphere—it just fades into space. Outer space is generally thought to begin about 62 miles (100 km) above the surface.

### Exosphere

This is the outer zone. Gas molecules can escape into space from here.

### Satellite

80 MILES  
130 KM

### Thermosphere

In this zone, temperature increases with height.

Aurora

### Mesosphere

A zone where temperature decreases with height.

50 MILES  
80 KM

### Stratosphere

Absorption of ultraviolet sunlight adds energy to the stratosphere, so temperature increases with height here.

Meteors

30 MILES  
50 KM

### Weather balloon

Troposphere  
All weather occurs in this layer.

10 MILES  
16 KM

Clouds

Airplane