

## Structure of Earth

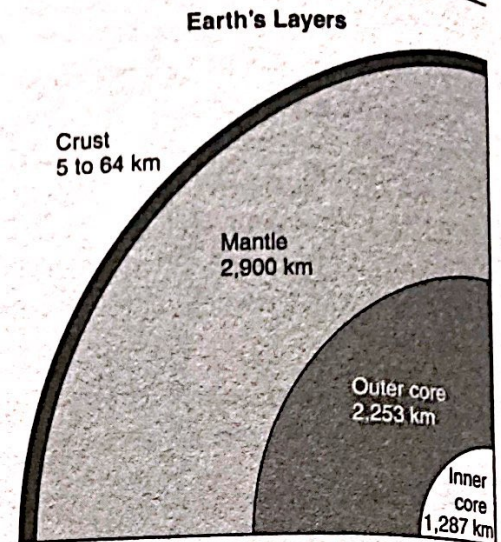
### Key Ideas

- Earth is made up of three main layers: the crust, mantle, and core.
- The theory of plate tectonics explains how the seafloor spreads, how major landforms are created, and how the continents move.
- At the margins between plates, plates move away from or toward each other, or they slide past each other.

### GED® TEST TIP

When you read a multiple-choice question, try to answer it before you read the choices. If one of the choices is similar to your answer, it is probably correct.

Earth is almost spherical, flattened at the poles, and bulging at the equator. It is composed of three main layers: the crust, the mantle, and the core. Earth's outer layer, its solid **crust**, is made of granite, basalt, gabbro, and other types of rock. Under the oceans, the crust is 3 to 6.8 miles thick; under the continents, the crust is from 12 to 40 miles thick. Below the crust is the molten **mantle**; it consists of silica and metal-rich minerals. The **core** has two layers: the outer core, which is mostly liquid iron, and the inner core, which is mostly solid iron. Extreme heat and pressure characterize the core.



The theory of plate tectonics explains phenomena of Earth's crust: seafloor spreading, the formation of major landforms, and the movement of continents. According to this theory, Earth's crust is made up of **tectonic plates** that fit together like a crude jigsaw puzzle. These plates move relative to one another at a rate of up to 15 centimeters (6 inches) a year. At the boundaries between plates, major landforms such as mountain ranges, volcanoes, ocean trenches, and mid-ocean ridges form, and earthquakes occur. There are three types of plate boundaries, or **margins**.

- At a **constructive margin**, two plates are moving apart and new crust is forming. Molten material from the mantle below wells up in the space between the plates, hardens, and forms new crust, usually at a mid-ocean ridge. For example, at the Mid-Atlantic Ridge, new crust is forming, causing the seafloor to spread and grow by about 5 centimeters (2 inches) a year.
- At a **destructive margin**, two plates are colliding and crust is being destroyed. When a continental plate collides with an oceanic plate, the denser oceanic crust may be forced under the other plate, forming a deep trench. When two plates consisting of continental crust collide, the crust crumples to form mountain ranges such as the Andes.
- At a **transform, or conservative, margin**, two plates are sliding by one another, and no crust is created or destroyed. For example, the San Andreas fault in California is the boundary between the North American plate and the Pacific plate, which is sliding northwest, causing many earthquakes.

As the plates move, they carry the continents with them. Scientists believe that a single large continent, **Pangaea**, existed about 250 million years ago. It gradually broke apart, and over millions of years the pieces (which are today's continents) drifted into the locations they are in today.