

PLATE TECTONICS

Name _____ Class period _____

The Layers of the Earth

The Earth is divided into four major layers. They are the crust, the mantle, the outer core, and inner core. What we know about these layers of the Earth is from our observations of activity at the crust as well as information we receive by sending electromagnetic waves towards the center of the Earth and recording the results with a seismogram.

The crust

The crust averages about 20 - 30 miles of thickness on the continents; it is much thinner under the ocean where it averages 3 - 6 miles. The thickest crust is found beneath the mountains due to their high elevations. Over 75% of the crust consists of SiO₂ (60.6%) and Al₂O₃ (15.9%). As you move deeper in the crust, the temperature begins to warm up. The crust is the solid part of the Earth upon which we live; the crust is all of the continents and the seafloor in between them.

The mantle

The mantle is an important part of the Earth's composition because it is believed to have a great impact on the behavior of the crust. The crust is believed to "float" on top of the mantle, much like a surfboard floats in water. Likewise, when the water below the surfboard moves, the board moves with it. The mantle is the liquid magma (melted rock) that exists directly below the crust. It is believed to circulate and influence the crustal plates.

The outer and inner core

Scientists know the least about the core of the Earth. However, it is believed that there is a liquid outer core that rotates (spins) around a solid inner core and causes magnetism. The inner core is theorized to be made up of mostly iron and some nickel.

Answer the following questions.

1. In which Earth layer are most convection currents that cause seafloor spreading thought to be located?

- A. crust
- B. asthenosphere
- C. outer core
- D. inner core

2. Which element is most abundant in Earth's crust?

- A. nitrogen
- B. hydrogen
- C. oxygen
- D. silicon

3. The two elements that make up the largest percentage by mass of Earth's crust are oxygen and

- A. silicon
- B. potassium
- C. hydrogen
- D. nitrogen

4. Earth's inner core is inferred to be solid based on the analysis of

- A. seismic waves
- B. crustal rocks
- C. radioactive decay rates
- D. magnetic pole reversals

5. Compared to Earth's continental crust, Earth's oceanic crust is

- A. thinner and more dense
- B. thinner and less dense
- C. thicker and more dense
- D. thicker and less dense

6. Which temperature is inferred to exist in Earth's plastic mantle?

- A. 2000°C
- B. 3000°C
- C. 5000°C
- D. 6000°C