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Beneath our Feet: The Four Layers of Earth

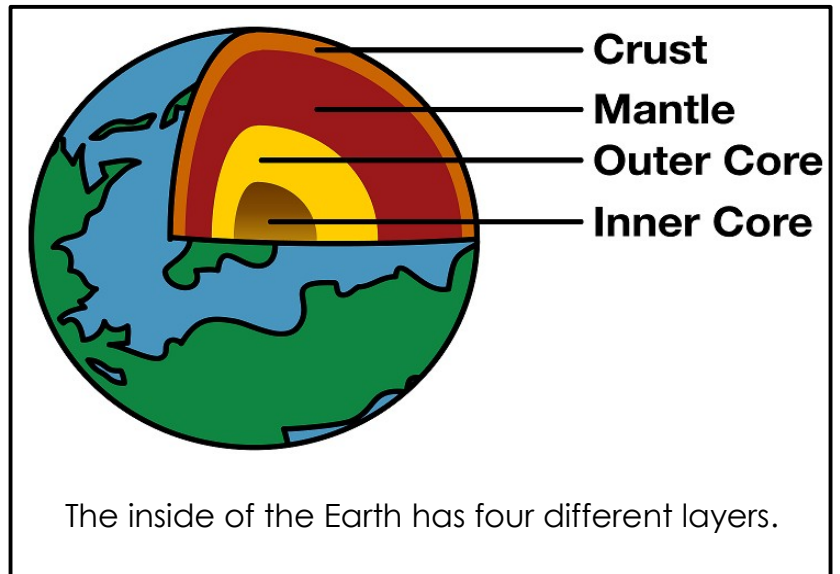
by Kelly Hashway

We all call the Earth home, but did you ever think about what our home is actually made of? The planet is approximately 4,000 miles from surface to center, but what makes up those miles of Earth?

First, let's start with the part of the Earth that we live on, the outermost layer called the crust. It is made up of loose material, like rocks, soil, and seabed. The crust is about five miles deep beneath the oceans and about twenty-five miles thick below the continents.

Beyond the crust is the mantle. The mantle extends approximately 1,800 miles deep into the Earth. It makes up about 85% of the total weight of the Earth's mass. The mantle also has layers. The first 50 miles are hard rock. The next 150 miles are super-heated molten rock that is so hot it can flow under pressure, like tar. Underneath this heated layer is several hundred miles of solid rock. Think of the mantle like a peanut butter sandwich. You have the two pieces of bread and the peanut butter between them. In the mantle, we have two layers of solid rock with heated flowing rock between them.

Next is the outer core. This is about 3,000 miles beneath the Earth's surface. The outer core consists of super-heated liquid molten lava. The lava is mostly made up of iron and nickel, which is why some geologists call it molten metal instead of molten rock. The outer core creates the Earth's magnetic field.



The final layer is the inner core, which is 900 miles deep. Scientists believe the inner core is a solid ball of iron and other minerals. The temperature is extremely hot, somewhere between 9,000 and 13,000 degrees Fahrenheit. But because of the high pressure, the iron and other minerals cannot melt. The heat of the inner core is sometimes compared to the heat of the sun.

Are you wondering why the Earth is made up of four different layers? Many scientists believe that the Earth wasn't always like this. They believe that when the Earth was formed, it was a hot ball made up of a mixture of rock and metals. They think that as the Earth cooled, the heavier parts sank to the inside and the lighter materials rose to the top. This would explain why the inner core is made up of iron and the crust consists of lighter rock and loose material.

As you walk around and enjoy the beauty on the Earth's surface, think about the many layers beneath your feet. It takes all these layers to make up the planet we call home.



Have you ever seen pictures of lava pouring down the sides of a volcano?

The molten rock inside the Earth's mantle is called magma. When it erupts through a volcano, it's called lava.

When it cools, the lava will harden and form new soil and rock, which will become part of the Earth's crust.

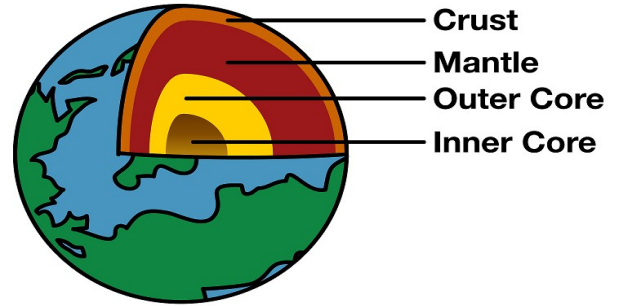
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1. Where is the Earth's crust the thickest?

- a. below the continents
- b. beneath the oceans
- c. below the equator
- d. below the North Pole



2. How is the Earth's mantle like a peanut butter sandwich?

- a. The mantle has three layers, like a peanut butter sandwich.
- b. The mantle is sticky, like peanut butter.
- c. The top and bottom layers of the mantle are the thickest parts.
- d. Peanut butter sandwiches feel like the hard rocks found in the mantle.

3. Which layers of the Earth are made mostly of metals?

4. Write the word true or false for each sentence.

_____ The inner core of the Earth is about the nine hundred degrees Fahrenheit.

_____ The inner core of the Earth is made of liquid iron and nickel.

_____ The Earth's mantle lies directly below the inner core.

5. Explain how scientists believe the Earth's four layers were formed.

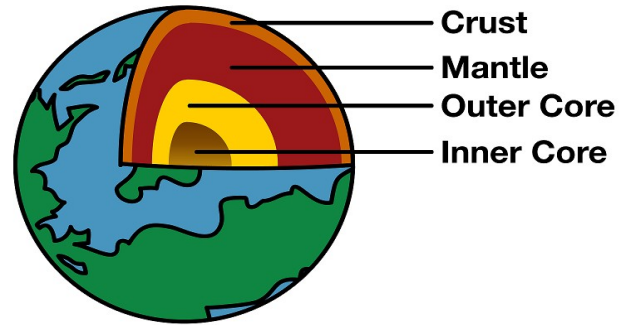
ANSWER KEY

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1. Where is the Earth's crust the thickest? **a**

- a. **below the continents**
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- c. below the equator
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2. How is the Earth's mantle like a peanut butter sandwich? **a**

- a. **The mantle has three layers, like a peanut butter sandwich.**
- b. The mantle is sticky, like peanut butter.
- c. The top and bottom layers of the mantle are the thickest parts.
- d. Peanut butter sandwiches feel like the hard rocks found in the mantle.

3. Which layers of the Earth are made mostly of metals?

The inner core and outer core are made of metals.

4. Write the word *true* or *false* for each sentence.

false The inner core of the Earth is about the nine hundred degrees Fahrenheit.

false The inner core of the Earth is made of liquid iron and nickel.

false The Earth's mantle lies directly below the inner core.

5. Explain how scientists believe the Earth's four layers were formed.

Many scientists believe that when the Earth was formed, it was a hot ball that was made of a mixture of different rock and metals. As it cooled, the heavier parts sank to the inside of the planet.