

Earth's Layers

Overview:

Students learn about the structure of Earth's layers and its source of the magnetic field within Earth's inner core by making a clay model planet.

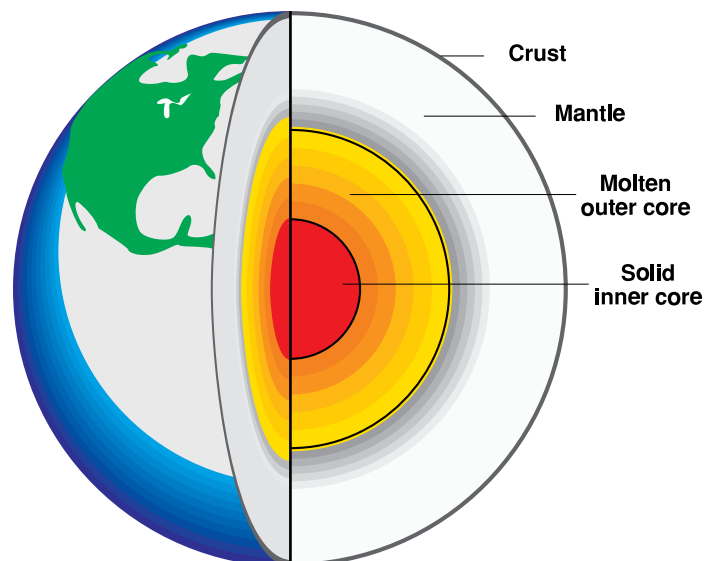
Objectives:

The student will:

- identify Earth's layers, including the inner core, outer core, mantle, and crust;
- model the relative sizes of each Earth layer;
- determine that iron and nickel make up molten rock within Earth's core; and
- explain the movement of molten rock in Earth's core helps generate Earth's magnetic field.

Materials:

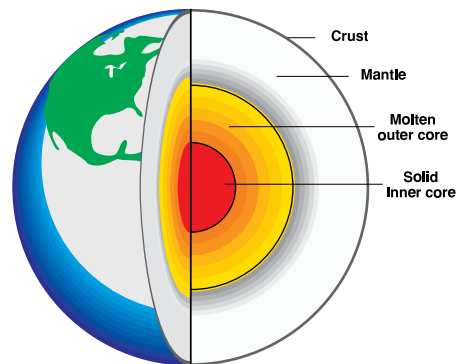
- Red, yellow, and blue clay
- Marble for each student
- Quart-size Ziploc™ bags
- Paper plate for each student
- Paring knife
- VISUAL AID: "Earth's Layers"
- STUDENT WORKSHEET: "Earth's Layers"



Earth's Layers

Activity Procedure:

1. Before class, put the following amounts of each color of clay into a Ziploc™ bag for each student:
 - 2.5 sticks of red clay for Earth's core (4 oz. ea.);
 - 6 sticks of yellow clay for Earth's mantle (4 oz. ea.);
 - 1 stick of blue clay for Earth's crust (4 oz. ea.).
2. Show VISUAL AID: "Earth's Layers" and describe Earth's core, mantle, and crust.
3. Pass out clay and a paper plate to each student. Use the paper plate as the building surface.
4. Ask students to roll the red clay into a ball to represent Earth's core, which is made up of iron and nickel. The temperature of the core is said to reach 5,000-8,000° F. Most of the rock in the core is molten, which means it is so hot that it melts and acts like liquid. As Earth spins, or rotates, the molten rock in the core moves. The movement of this molten rock helps generate Earth's magnetic field.
5. Wrap yellow clay for the mantle around the core (clay should be as thick as possible). This layer is about 1,700 miles thick. The mantle contains mostly solid rock and some molten rock, called magma. Magma can shoot up to Earth's surface through an erupting volcano.
6. Spread a thin layer of blue clay for the crust on top of the mantle. This layer, which is around 20 miles thick, is the part of Earth we live on. The crust is thickest under the continents, and thinnest under the oceans.
7. When the Earth model is complete, cut out a wedge using a paring knife to show a cross section of Earth's layers. Review the information given about the three layers.
8. Ask students to push a marble into the very center of the model Earth's core. Explain that the very center of Earth is called the inner core. Although the inner core (like the outer core) is made up of iron and nickel, it is solid, probably because it is under a lot of pressure. The solid inner core is about 1,400 miles thick; the molten outer core is about 1,600 miles thick.



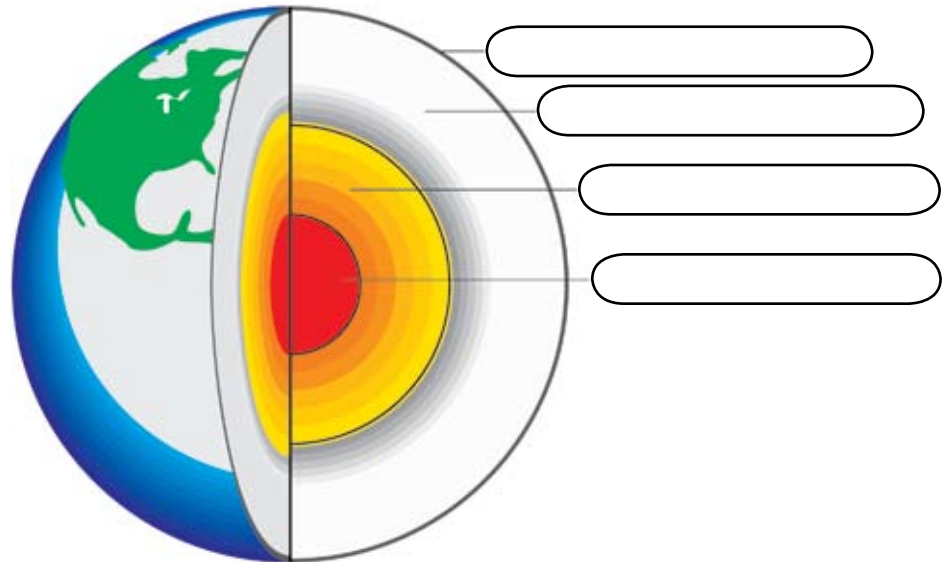
Answers to Student Worksheet:

1. Crust, Mantle, Molten outer core (refer to diagram on previous page)
2. iron and nickel
3. core

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1. Label Earth's layers.

Cross section of Earth



2. Name the two materials that make up Earth's inner and outer core.

A) _____

B) _____

3. Name the layer of Earth that contains mostly liquid rock. _____