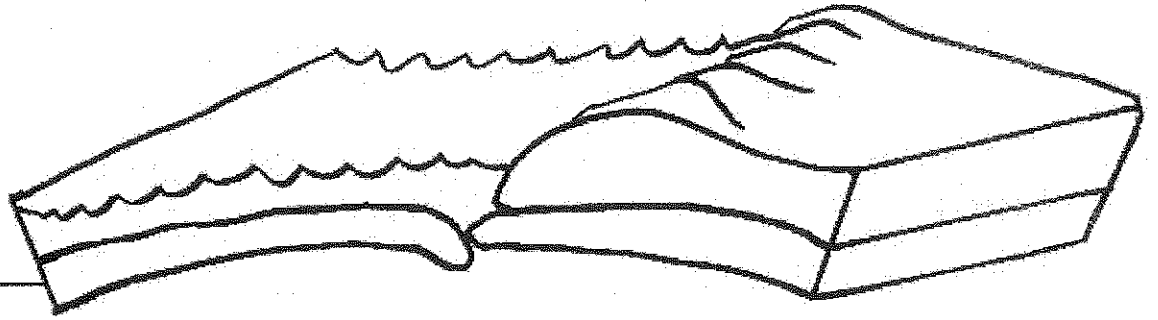
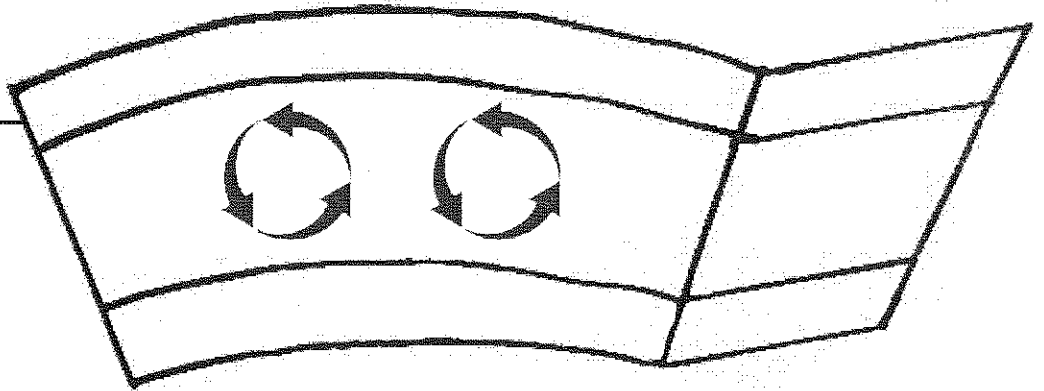


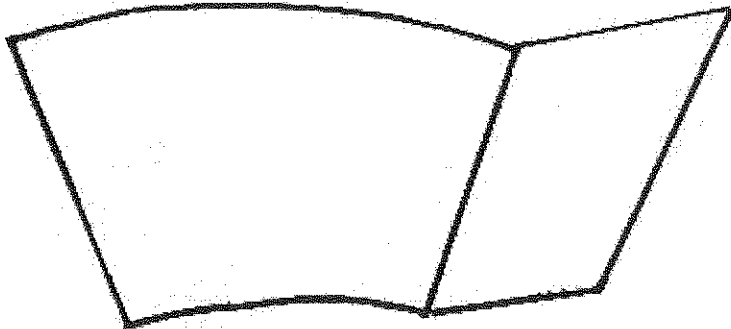
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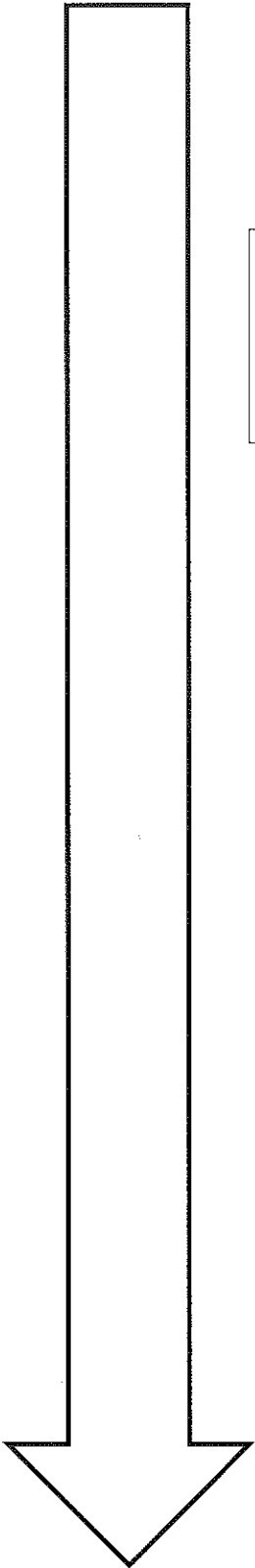
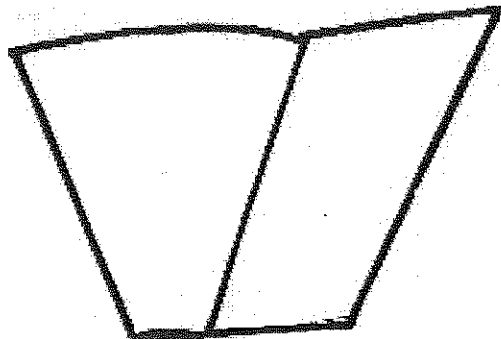
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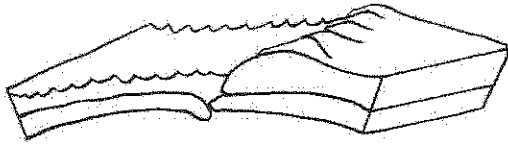
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# Layers of the Earth

Layer \_\_\_\_\_

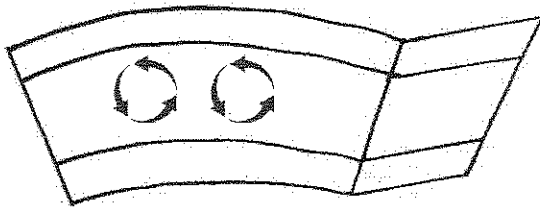
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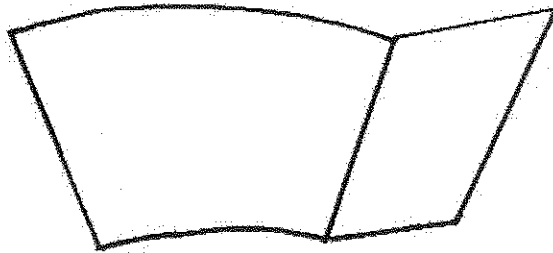
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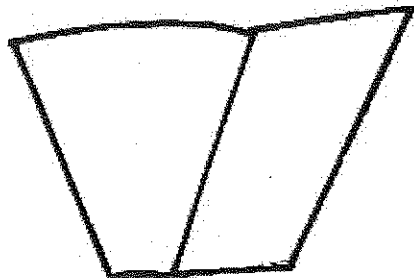
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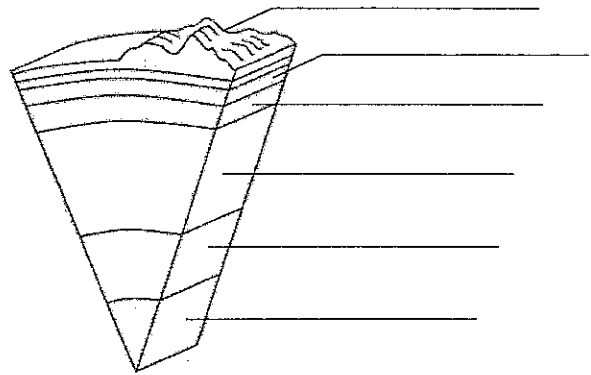
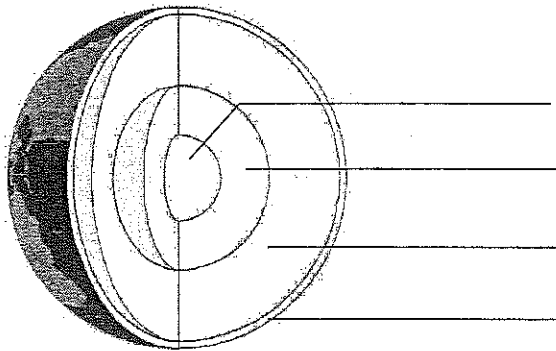
Description:



# Layers of the Earth Summarizer

Name \_\_\_\_\_ Date \_\_\_\_\_

Directions: Label the two diagrams with the layers of the earth. Use the following terms: Inner Core, Outer Core, Crust (2), Mantle, Lower Mantle, Middle Mantle, Upper Mantle



Answer the questions below using the diagrams above.

1. Write the 4 main layers of the earth in order from lowest temperature to highest temperature.
2. Which two layers of the earth make up the lithosphere?
3. Temperature, density, and pressure \_\_\_\_\_ (increases, decreases) as depth \_\_\_\_\_ (increases, decreases).
4. Which layer of the earth has the highest pressure, temperature, and density?
5. Which one of the three main layers of the earth contains convection currents that slowly move lithospheric plates?
6. Which layer of the earth is solid because of pressure?

## The Mantle

Let's think about an egg and its parts again. Remember, we compared the shell of an egg to the crust of the Earth. Just inside the shell is a thin membrane and the white of the egg. Let's see how that compares to the Earth's mantle.

Just below the Earth's crust is an area known as the *Mohorovicic Discontinuity*, or the *Moho*. In 1909, a Yugoslavian scientist named Adirja Mohorovicic, using data collected from seismographic studies, discovered a boundary separating the crust from the mantle. This area has been recognized as a distinct break between the two layers.

Below the *Moho* lies the Earth's mantle. This layer is believed to be about 2,900 kilometers (1,800 miles) thick. It makes up 80 percent of the Earth's total volume and 68 percent of its mass. This is the heaviest part of the Earth.

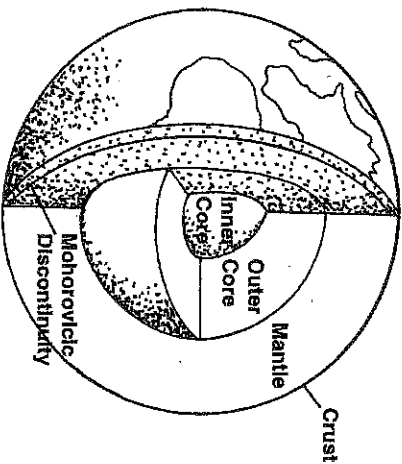
The mantle appears to be composed of silicon, oxygen, aluminum, iron, and magnesium. There seem to be greater percentages of iron deeper into the mantle.

Geologists believe that the mantle is solid rock, which is denser rock than that of the crust above it. The density of the mantle itself seems to increase as the depth increases. This may be due to the increased amount of iron deeper into the mantle.

Scientists have developed a model of the mantle that designates the first 100 kilometers (62 miles) as very rigid rock. From that point to a depth of 250 kilometers (155 miles), they believe the mantle is close to its melting point. The rock has reached a point of plasticity, but it has not changed from a solid form to a true liquid. It does not actually melt, due to the great pressure exerted upon it by the materials above. From the 250-kilometer line to the edge of the mantle at 2,900 kilometers, it is assumed to be rigid, solid matter again.

The plastic-like rock material in the 100- to 250-kilometer zone seems to flow, almost like syrup. This is magma, which is moving by the weight of the landmasses and oceans pressing down upon it.

The amount of pressure in the mantle increases as the depth of the mantle increases. Temperatures follow a similar pattern. Scientists believe temperatures may vary from 870 degrees Celsius (1,600 degrees Fahrenheit) at the top edge of the mantle to 2,200 degrees Celsius (4,000 degrees Fahrenheit) near the core.



## The Core

The final section of the Earth might be compared to the yolk of an egg. Just as the mantle was similar to the white, and the crust resembled the shell. With the current theory of the Earth's structure, however, scientists believe the core is really two layers: an outer core and an inner core. Let's compare the two.

### The Outer Core

This section of the Earth is believed to be 2,250 kilometers (1,398 miles) deep.

Temperatures range from 2,200 degrees Celsius (3,992 degrees Fahrenheit) to 5,000 degrees Celsius (9,032 degrees Fahrenheit) as you descend farther into this section of core.

Scientists believe the outer core is liquid and consists of very dense, melted iron and nickel.

The core's dense iron is believed to create an effect similar to the magnetic field that surrounds a magnet. This is how scientists explain the presence of Earth's magnetic field.

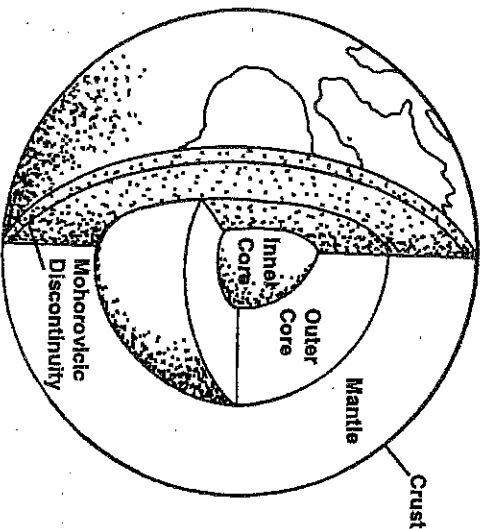
### The Inner Core

This section of the Earth is believed to be 1,300 kilometers (808 miles) deep from its edge to the center of the Earth.

Temperatures are believed to be approximately 5,000 degrees Celsius (9,032 degrees Fahrenheit) throughout this section.

Scientists believe the inner core is solid and consists of very dense, solid iron and nickel.

The inner core remains solid due to the immense pressure exerted on it. The pressure may be 2 million times stronger than normal pressure exerted on Earth's surface.



Name \_\_\_\_\_ Date \_\_\_\_\_

For the student:

1. Which part of an egg compares to the Moho? \_\_\_\_\_

2. Which part of an egg compares to the mantle? \_\_\_\_\_

3. What do scientists believe explains the increased density of material deeper into the mantle?

\_\_\_\_\_  
\_\_\_\_\_

4. What happens to temperatures in the mantle? \_\_\_\_\_

\_\_\_\_\_

5. Why does part of the mantle appear to flow? \_\_\_\_\_

\_\_\_\_\_

6. How deep is the total core of the Earth? \_\_\_\_\_

7. What is the main difference between the inner core and the outer core? \_\_\_\_\_

\_\_\_\_\_

8. Why does that difference exist? \_\_\_\_\_

\_\_\_\_\_

9. How do scientists explain the presence of a magnetic field around the Earth? \_\_\_\_\_

\_\_\_\_\_

10. Why is there so much more pressure exerted on the Earth's core than on the Earth's surface?

\_\_\_\_\_

\_\_\_\_\_

