



THE EARTH

Domain: 4.9

describes the dynamic structure of Earth and its relationship to other parts of our solar system and universe

The Structure of The Earth

The Earth's internal structure is divided into several layers as shown in the diagram below:

Outer core-

The **outer core** begins about 2900 kilometres below the Earth's surface. Scientists believe the outer core is about 2250 kilometres thick and is made of melted iron and nickel. The temperature of the outer core ranges from about 4500 °C in the uppermost parts to about 6300 °C in the deepest parts.

Crust-

Continents and ocean basins are part of a rocky "skin" that surrounds the main body of the Earth. This skin is called the Earth's **crust**. The thickness of the crust varies from about 8 kilometres under the oceans to about 40 kilometres under the continents. Temperatures within the deepest parts of the crust may reach 870 °C-hot enough to melt rocks.

Mantle-

The **mantle** is a thick layer of rock below the crust of the Earth's surface. Although it appears solid, because it is under intense heat and pressure, it behaves like an extremely slow-moving liquid. It goes down about 2900 kilometres. The rock in the mantle is made of silicon, oxygen, aluminium, iron, and magnesium. The upper part of the mantle has a temperature of about 870 °C. This temperature gradually increases down through the mantle to about 4400 °C where the mantle meets the next lower section, the outer core.

Asthenosphere-

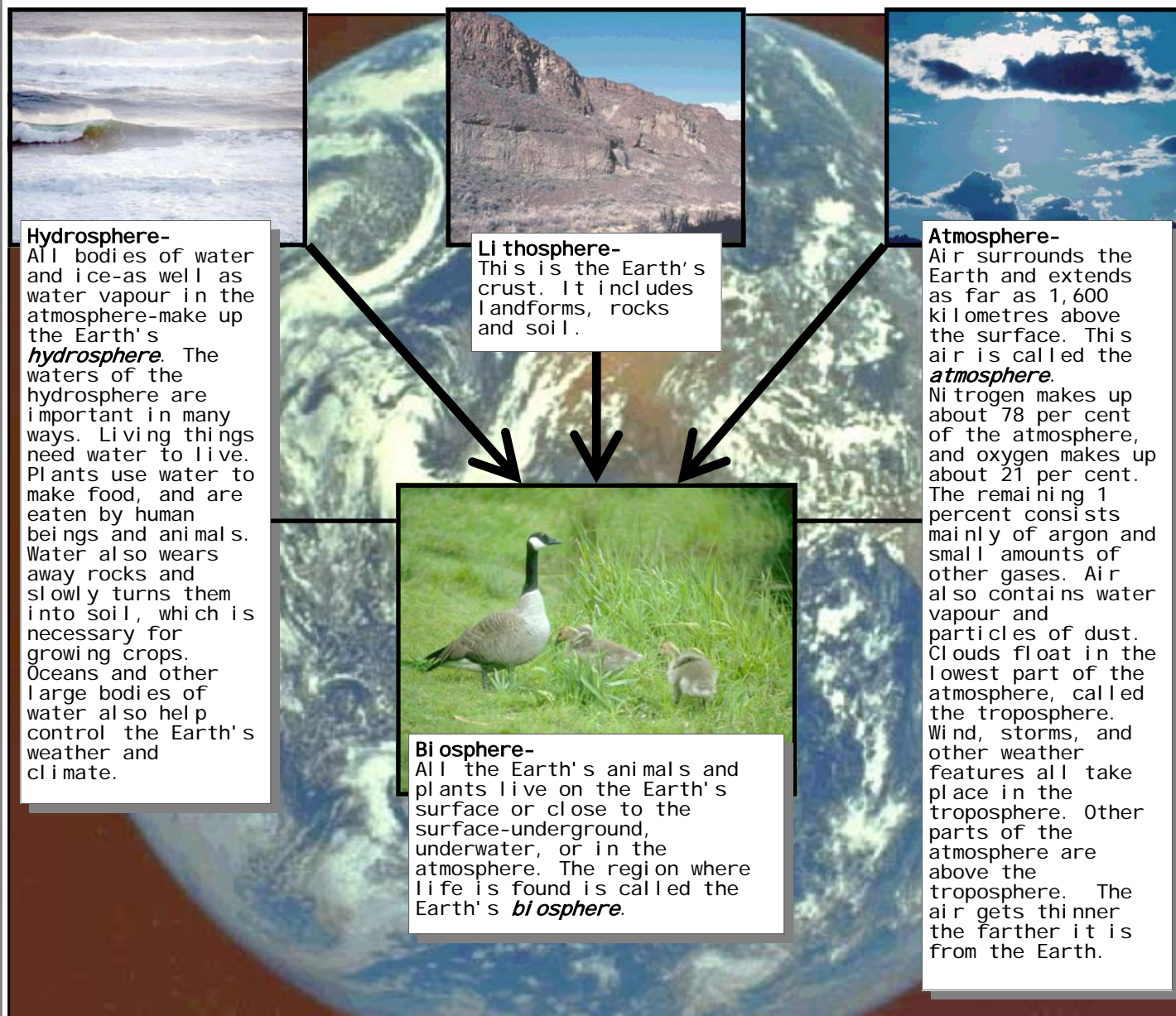
The hot, soft, semi-fluid upper layer of the mantle. It is below the crust. It is where magma (molten rock) originates.

Inner core-

The **inner core** lies within the outer core and makes up the centre of the Earth. The boundary between the outer and inner cores is about 5150 kilometres below the Earth's surface. The centre of the inner core is about 1300 kilometres below this boundary, or about 6400 kilometres below the Earth's surface. Scientists believe the inner core consists of solid iron and nickel. The temperature there may be as high as 7000 °C. At normal pressures, these metals would have turned into gases.

The Earth is thought to be about 5000 million years old. It is almost a **sphere**. There is a slight bulge about the **equator** and the **polar regions** are slightly flattened. The internal structure of the Earth consists of a number of layers as shown in the diagram.

The Earth's Biosphere



Questions:

1. What are the four main layers of the Earth's structure?
2. The following questions refer to the structure of the Earth:
 - (a) Which layer is the outer layer?
 - (b) Which layer is the thickest layer?
 - (c) Which layer is liquid?
 - (d) Which layer is at the centre of the Earth?
 - (e) What is the asthenosphere?
3. Draw a column graph to represent the difference in thickness of the layers of the Earth. Use 50 km for the crust.
4. (a) How old is the Earth thought to be? (b) Describe the shape of the Earth.
5. What is the Earth's biosphere?
6. Which part of the Earth:
 - (a) is made up of air?;
 - (b) is made up of all the water and ice on the Earth?;
 - (c) is the Earth's crust?