**THE EARTH’S STRUCTURE**

Earth is unique among the known planets: it has an abundance of water. Other worlds, including a few moons have atmospheres, ice, and even oceans, but only Earth has the right combination to sustain life.

Earth’s oceans cover about 70 per cent of the planet’s surface with an average depth of 2.5 miles (4kilometres). Freshwater exists in liquid form in lakes and rivers and as water vapour in the atmosphere, which causes much of Earth’s weather.

The earth structure is divided into two main layers:

1. The interior structure of the Earth
2. The outer structure of the earth.

The interior structure is layered in spherical shells, like an onion. These layers can be defined by their chemical and their rheological properties. Earth has an outer silicate solid crust, a highly viscous **mantle**, a liquid outer core that is much less viscous than the **mantle**, and a solid inner core. The earth’s structure is divided into two groups namely Outer structure and Inner structure.

The outer (external) structure of the earth is made up of the following layers.

1. **The Atmosphere**: the atmosphere is made up of a mixture of gases that cover

the earth. The Atmosphere contains 73% of Nitrogen, 1% of Oxygen, 0.03% of

carbon and 0.97% inert gases.

**Importance of the Atmosphere**

(i) The atmosphere provides gases essential for respiration

(ii) The atmosphere provides Nitrogen for plants

(iii) The atmosphere contains the ozone layer which is the shield against ultraviolet

rays from the sun

(iv) The atmosphere is also a habitat for some microorganisms

2. **The Hydrosphere**: hydrosphere is the water mass of the earth. It is made up of

streams, ponds, rivers, oceans, lakes and seas. It is 70% of the earth surface.

**Importance of the Hydrosphere**

(i) Hydrosphere provides water for domestic and industrial use

(ii) Hydrosphere creates employment

(iii) Hydrosphere can be used to generate electricity

(iv) Hydrosphere encourages tourism

3**. The Biosphere**: biosphere is the biologically active part of the earth. The

biosphere consists of plants, animals and organisms. There are aquatic and

terrestrial bicycles

**Importance of the Biosphere**

(i) Biosphere produce plants which provide food for man

(ii) Biosphere provide an energy source to man

(iii) Biosphere balances and purifies atmospheric gas

(iv) Biosphere provides raw materials for industries

(v) Biosphere creates employment for man through agriculture

4. **The Lithosphere:**

The lithosphere includes the crust and the uppermost mantle, which constitute the

hard and rigid, rocky outer layer of the Earth. The uppermost part of the lithosphere

that chemically reacts to the atmosphere, hydrosphere and biosphere through the

soil-forming process is called the pedosphere.

**Importance of the Lithosphere:**

1. The lithosphere serves as a source of minerals. The minerals supply the basic

materials required for making a variety of commodities, which man uses daily.

2. The lithosphere is also the major source of fuels such as coal, petroleum and

natural gas. Without these fuels human life, as we know it today, would have been

impossible.

3. The lithosphere in combination with the hydrosphere and the atmosphere plays a

vital role in the growth of plants and animals. It provides nutrients to the plants. The

plants are the source of food for man and all other animals.

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**Geography SSS1 First Term**

**Week 7**

**Earth’s Structure (II)**

**Performance Objective**

The student should be able to:

The Earth crust

The Mantle or Mesosphere

The core or Barysphere

**The Earth is made up of four distinct layers**

The inner core is in the centre and is the hottest part of the Earth. It is solid and

made up of iron and nickel with temperatures of up to 5,500°C. With its immense

heat energy, the inner core is like the engine room of the Earth.

The outer core is the layer surrounding the inner core. It is a liquid layer, also made

up of iron and nickel. It is still extremely hot, with temperatures similar to the inner

core.

The mantle is the widest section of the Earth. It has a thickness of approximately

2,900 km. The mantle is made up of semi-molten rock called magma. In the upper

parts of the mantle, the rock is hard, but lower down the rock is soft and beginning to

melt.

The crust is the outer layer of the earth. It is a thin layer between 0-60 km thick. The

crust is the solid rock layer upon which we live.

There are two different types of crust: continental crust, which carries land, and

oceanic crust, which carries water.

**Mantle**

Earth’s mantle extends to a depth of 2,890 km, making it the thickest layer of Earth.

The mantle is divided into the upper and lower mantle. The upper and lower mantle

are separated by the transition zone

**Earth Crust**

Earth’s crust is made up of several elements: oxygen, 47 per cent; silicon, 27 per

cent; aluminium, 8 per cent; iron, 5 per cent; calcium, 4 per cent; magnesium,

potassium and sodium, 2 per cent. The crust ranges from 5–70 km (~3–44 miles) indepth

and is the outermost layer. The thin parts are the oceanic crust, which

underlies the ocean basins (5–10 km) and is composed of dense (mafic) iron

magnesium silicate igneous rocks, like basalt. The thicker crust is the continental

crust, which is less dense and composed of (felsic) sodium potassium aluminium

silicate rocks, like granite. The rocks of the crust fall into two major categories – sial

and sima.

**Earth Core**

At the centre of the Earth is the core, which has two parts. The solid, inner core of

iron has a radius of about 760 miles (about 1,220 km). It is surrounded by a liquid,

outer core composed of a nickel-iron alloy. It is about 1,355 miles (2,180 km) thick.

The inner core spins at a different speed than the rest of the planet. This is thought

to cause Earth’s magnetic field. When charged particles from the solar wind collide

with air molecules above Earth’s magnetic poles, it causes the air molecules to

glow, causing the auroras — the northern and southern lights.

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