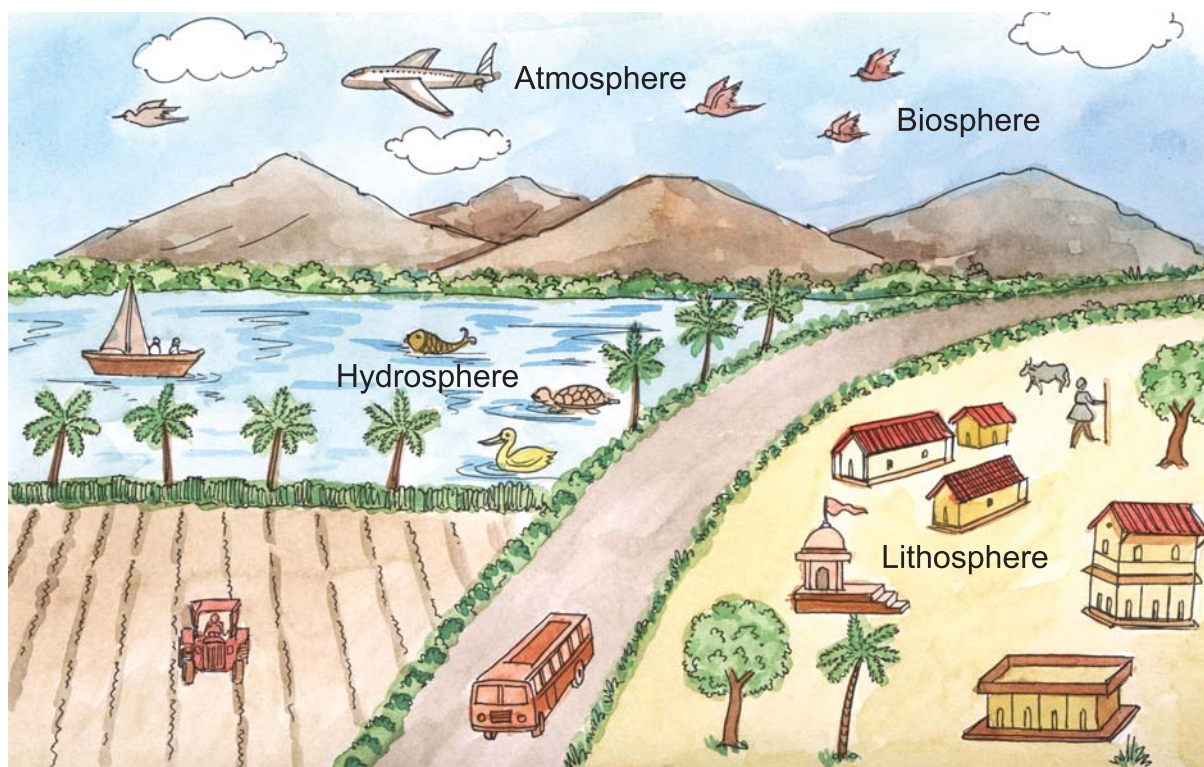


2

WHAT IS AROUND US?

Dhanvin was roaming in the garden with his mother. While walking, a question arose in his mind. Dhanvin asked his mother, “What is land made up of?” Mother replied, “Do you see the Sun every day? The Sun too has a family which is known as the ‘Solar Family’. Our Earth is one of the members of the solar family. The most important point is that only the Earth among all the members of the solar family has got the suitable temperature, water and air to sustain living beings.”

Generally, it is believed that part of Sun, which has been detached from the Sun after the collision; is Earth. At the time of its origin, it was in the form of a fireball. This fireball started to cool down slowly. Many elements of the Earth got transformed into liquid and further into solid form. During this process, the elements which got transformed into solid are known as the lithosphere. The elements which got transformed into liquid are known as the hydrosphere. The elements which transformed into gases came to be known as the atmosphere. Above all, the living world which developed due to land, water and air came to be known as the Biosphere. In this way, the four spheres came into existence on Earth.



2.1 Spheres of the Earth

Lithosphere

The sphere on which we live is known as the lithosphere. ‘**Litho**’ means rock and ‘**sphere**’ means layer. The upper layer of the Earth is made of soil and solid materials like rock. Approximately 29% of the surface of the Earth is covered with lithosphere. This layer is almost 64 km to 100 km thick. The thickness of the lithosphere is not the same everywhere on the earth. Similarly, their interior and exterior do not have identical physical features. It is mostly made up of substances like soil and rocks.

Land forms like mountains, plateaus, plains and valleys are seen on the lithosphere. The temperature increases as we move towards the center of the Earth. The molten rocks in the interior of the Earth are known as Magma. There are many gases present in the interior of the Earth which rise up with pressure and heat. But the pressure of rocks of the surface of the Earth is equally strong. Thus, balance between the two is maintained. So, the crust of the Earth does not break. When the balance between the two is not maintained the crust breaks and a volcano erupts.

“Mummy, how is the lithosphere useful to us?”

“Where can we construct our home if the lithosphere is not there? Without lithosphere how can we get water to drink, agriculture for food, minerals for industries and forests? Draw a picture depicting all the details you observe on lithosphere based on our conversation.”

Activity

- *Discuss and draw a figure as stated above with the help of your teacher.*

Hydrosphere

Now, let me talk to you about Hydrosphere. The Hydrosphere is the liquid component of the Earth. It includes the oceans, seas, lakes, ponds, rivers and streams. On the surface of the Earth, the area of water is more than that of land. Hydrosphere covers 71% of the Earth's surface. A water body in hydrosphere that carries a huge amount of water is known as the ocean. These oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean and the Arctic Ocean. All these oceans are connected with each other. The water bodies close to the land are known as seas, bays, straits, gulfs, etc. The oceans on the earth are huge and deep. Valleys with depth of 10 to 11 kms are located at their bottom. The ocean bed has similar features like that of the surface of the Earth. It has high mountains, plateaus, vast plains, valleys, etc.

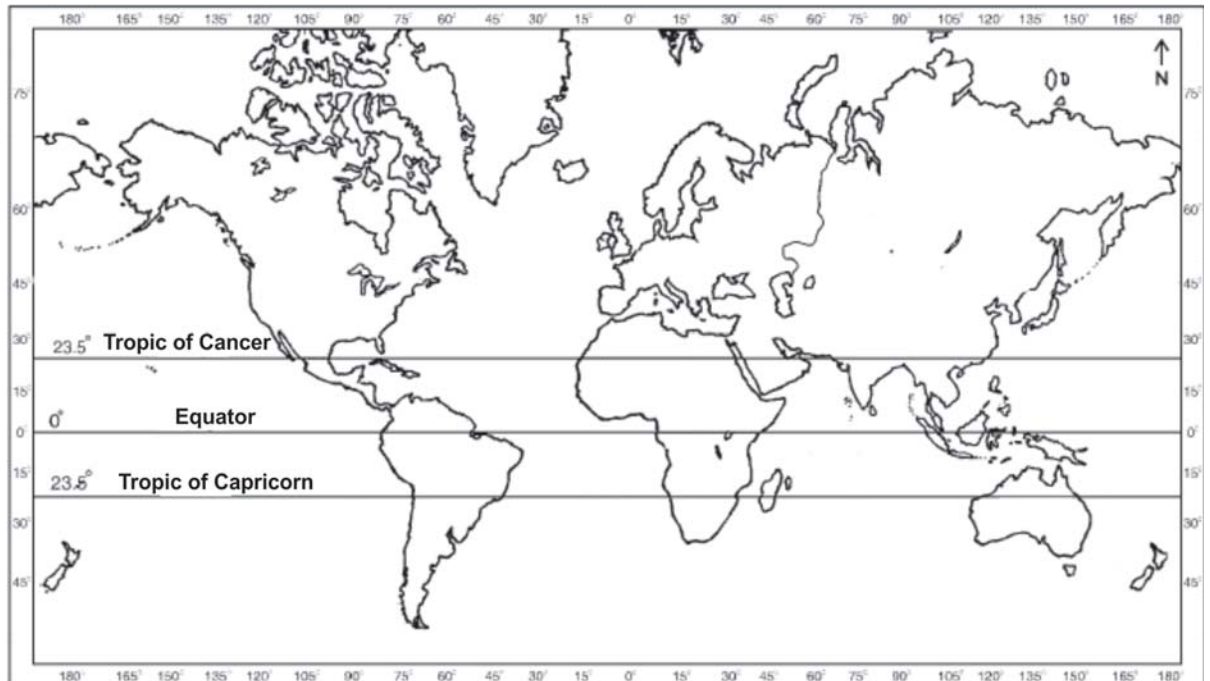
‘Mummy, how much water will there be in the seas? Since sea water is salty, is it useful to us?’

Yes, oceans contain 97% of the total amount of water on the earth. Approximately 1/3 of remaining water is trapped in ice-caps and glaciers (at Poles, Himalayas and other mountains). Some water is accumulated in the lakes and some flows in the rivers and some is stored in the interior of Earth as ground water. The amount of potable (fit for drinking) water is less. Fresh water is precious. This Fresh water is required by living beings for their existence. The moisture for rain, which is the main source of fresh water, comes from the oceans only.

Valuable chemicals, minerals, salt, fishes, etc. are found in the seas. As we have living organisms on the land, in the same way, the seas and oceans have aquatic life inside them. The tremendous force of waves, tides and currents of oceans are potential sources for generating electricity. Besides, these oceans are also useful as waterways.

Think

- *What would happen if there were no seas?*



2.2 Outline map of the world

Activity

- *Locate using various colours, the oceans, seas, bays and straits in the world map given above.*

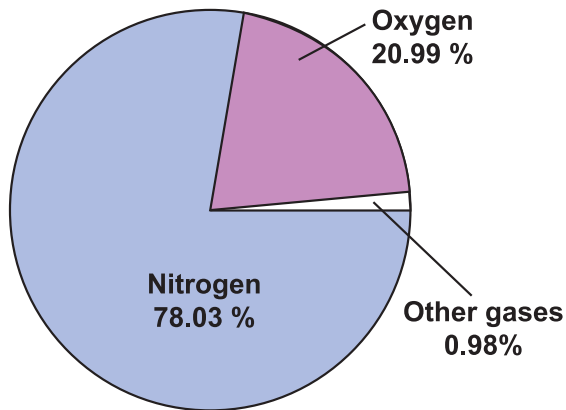
Now, let's understand the third sphere.

Atmosphere

The sphere of air that wraps the Earth from all sides is called Atmosphere. It extends approximately upto 1600 km from the surface of Earth. It cannot be seen clearly with the naked eye like Lithosphere and Hydrosphere. Atmosphere is composed of various gases, water vapour, dust particles, smoke, salt, micro organisms etc. Atmosphere is colourless, odourless and transparent. Solid, liquid and gaseous elements are included in the Atmosphere. It contains approximately 78% nitrogen, 21% oxygen and 1 % other gases.

When we go higher from the surface of the Earth, the amount of most of the gases in the atmosphere decreases. Carbon dioxide gas is heavy so it is found more in the lower layer of the air.

Ozone gas comprises of a very small proportion in the air. This gas absorbs the ultraviolet rays from the Sun and protects the Earth from excessive heat of Sun. This gas is more in proportion in the morning in the open ground and in the air near the sea.



2.3 Amount of gases in Atmosphere

Gases like oxygen and nitrogen keeps the living creatures on the Earth alive. Nitrogen reduces the intensity of oxygen. Water is the most important component in the atmosphere. Due to heat, the water in the form of vapour evaporates and mixes with air which is known as moisture. The process of cooling of vapour is called condensation. Various forms of moisture like dew, fog, clouds and precipitation are due to condensation. The effect of atmosphere is seen on human beings in every aspect of life such as in their food habits, clothing, habitat, colour, economic activities, etc.

Many dust particles are seen in the atmosphere. Spreading of Sunrays are visible due to these particles. It is due to dust particles that it does not suddenly turn dark after the sunset and it does not suddenly turn bright after the sunrise. The sunrays are reflected back with the help of these dust particles on the surface of the Earth and we receive the light of the Sun. We are able to listen to the sounds due to the presence of atmosphere. That is why radio and Doordarshan telecast is possible.

Think

- On the basis of which experiences can you state that the Atmosphere exists on the surface of the earth?



2.4 Human life and spheres

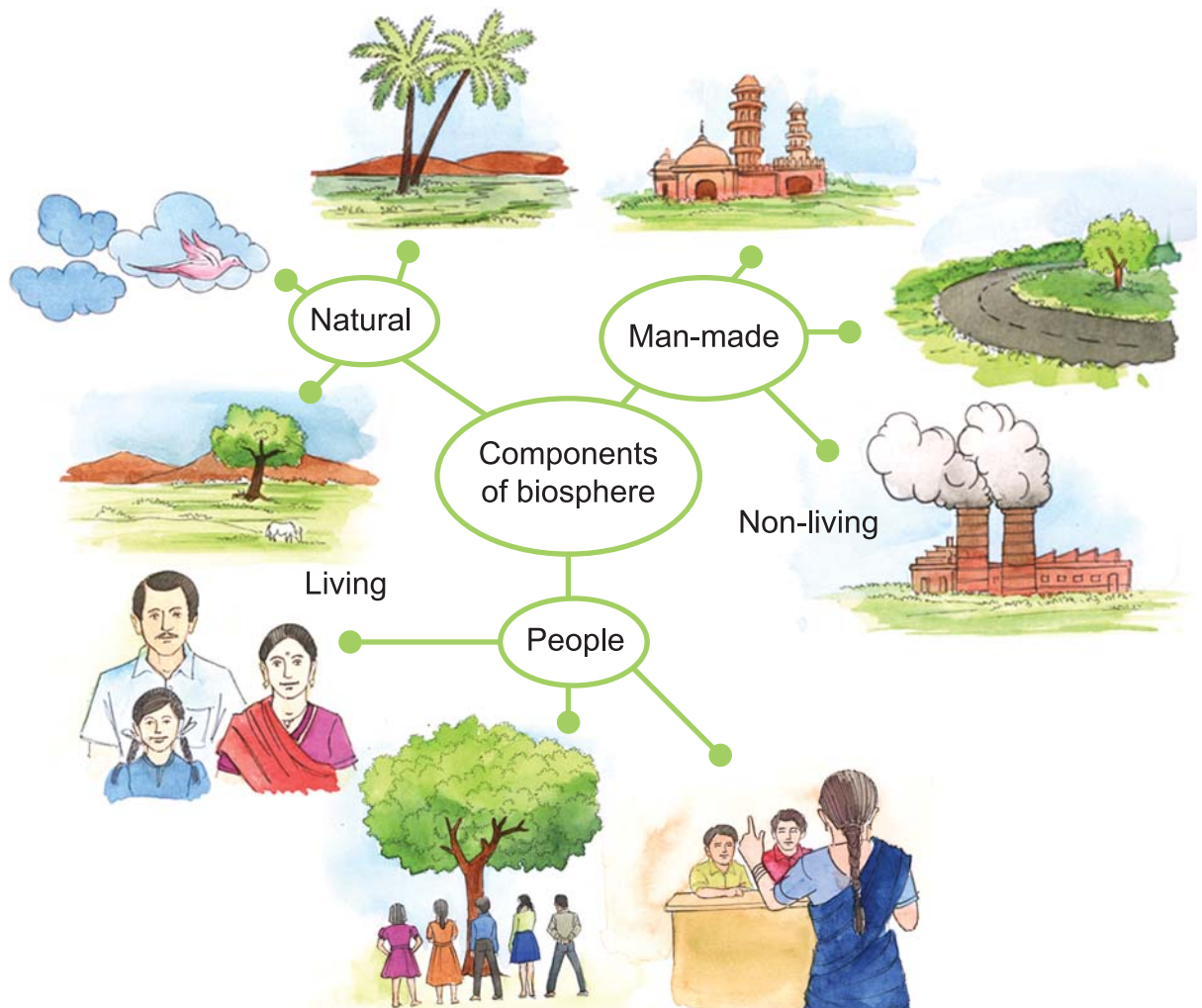
Biosphere

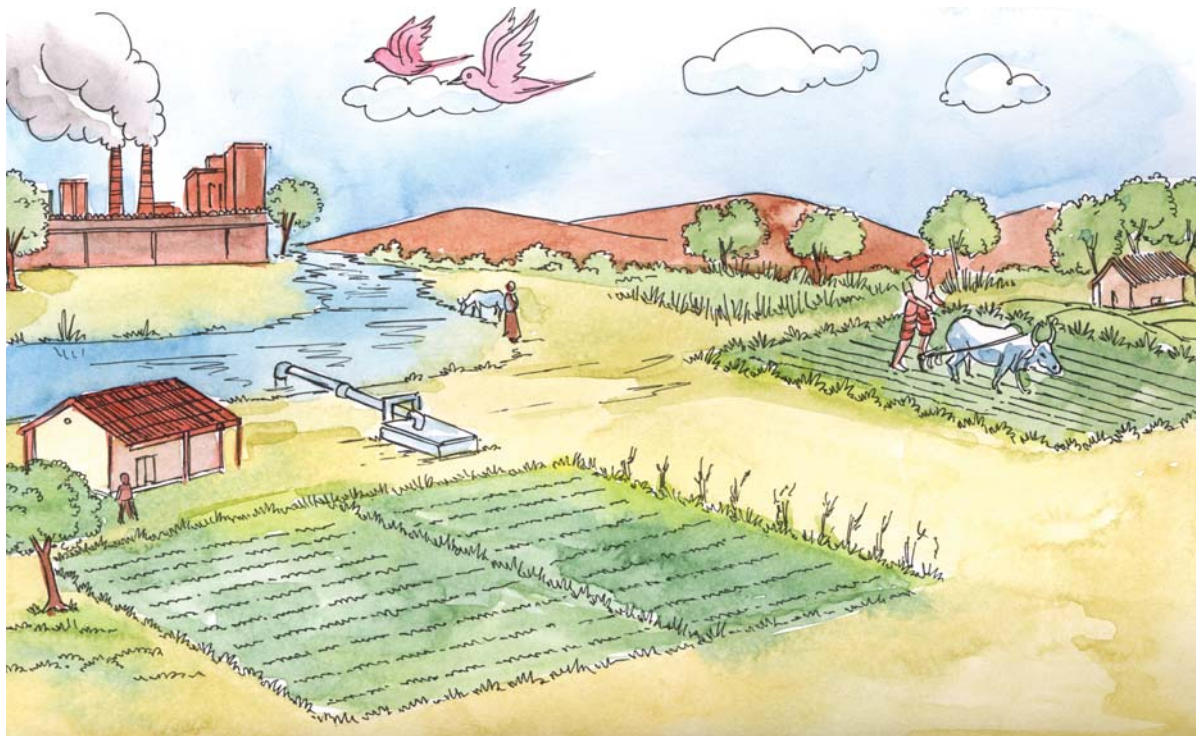
The part of lithosphere, hydrosphere and atmosphere where the living world exists is known as biosphere. Biosphere is one of the important spheres on Earth. Earth is the only planet in the solar system having biosphere. Biosphere includes vegetation, animals, insects and human beings. We obtain food and many other necessary things from biosphere. We cannot live without vegetation and animals. Biosphere is the base of our existence and living. It is divided into two parts: (1) *Non-living* and (2) *Living*. Lithosphere, Hydrosphere and Atmosphere form the non-living part while plants, animals and micro-organisms are included in the living world.

Think

- *If any element in the living world is destroyed, then what will be its effect on our lives? For instance, what happens if the birds are wiped out from the face of the Earth?*

'If man harms the Earth by his activities, then do you think it will affect these spheres?'





2.6 Effect of human activities on spheres

Human beings knowingly and unknowingly undertake many activities for their development. Human action causes an imbalance in the different spheres. Due to this, the balance of various spheres is threatened. Underground nuclear testing, too much drilling for mineral oil and excessive drilling of tube wells affects the lithosphere and causes an imbalance. The dumping of waste from villages and cities along with industrial waste into the water bodies pollute them. The Polar caps have started melting due to increasing heat. The oil spills from ships and disposal of industrial and chemical waste into the water causes the destruction of marine life which is highly dangerous for the hydrosphere. Harmful gases emitted by industries, workshops, power stations and vehicles pollute air. The areas with the higher frequency of vehicles show increased rate of carbon monoxide in the air. The amount of CO_2 in the air increases due to the cutting of trees. Heat on the Earth increases due to increase in CO_2 in air. In this way, human activities affect the Biosphere.

The nurturing links of nature are endangered due to the exploitation of environment which endangers the Biosphere.

Activity

- ***Make a list of natural events and human activities that have adversely affected various spheres of the Earth.***

Project

Find out the sources of pollution in your surrounding and study its effects as well as suggest solutions to eradicate it.

EXERCISES

Q. 1 Answer the following questions

1. What do you know about our Earth? Write a short note.
2. How much time was taken by the Earth to reach its present form after being detached from the Sun? Why?
3. How are the spheres of Earth inter-related?

Q.2 Fill in the blanks with appropriate words

- 1 There are totally spheres on the Earth.
2. Lithosphere covers approximately percent of the surface of the Earth.
3. The most prominent liquid component in the atmosphere is
4. Hydrosphere, made of water, makes uppercent of the surface of the Earth.
5. gas absorbs the ultraviolet rays of the sun.

Q.3 Give the meaning of following terms

- (1) Lithosphere (2) Hydrosphere (3) Atmosphere (4) Biosphere (5) Pollution

Q.4 State whether the following statements are true or false

1. The Earth is a member of the solar family.
2. The proportion of water on the surface of the earth is less than the proportion of land.
3. The fresh water is a gift of hydrosphere.
4. Oxygen dilutes Nitrogen.

Q.5 Explain how the following are related to your life

1. Mountains :
2. Fields :
3. Rivers :
4. Lakes :
5. Forest :