CHAPTER

1 Environment

OBJECTIVES

In this section, we shall learn about:

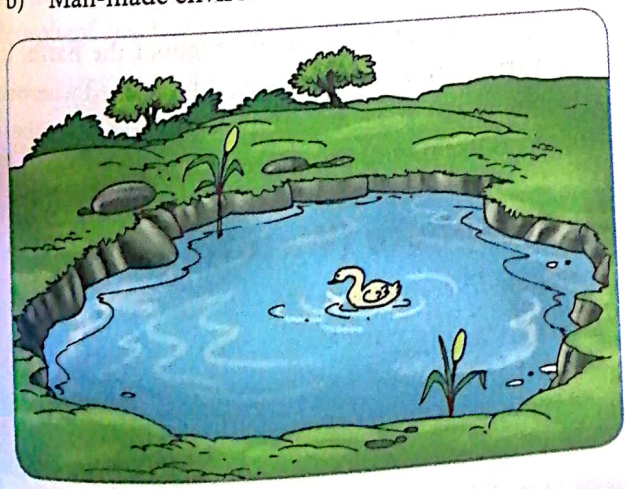
- Our Environment
- Components of Environment
- Our Natural Environment
  - Lithosphere (Land)
  - Hydrosphere (Water)
  - Atmosphere (Air)
- Adaptation to Environment
- Ecosystem
- We and Our Environment

Our Environment

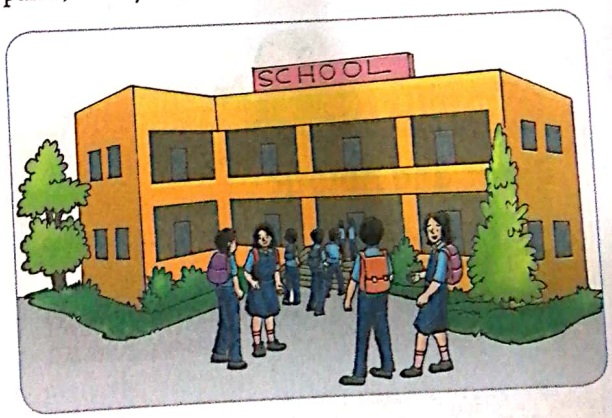
The surroundings and conditions in which we live constitute our 'Environment'. The word 'Environment' means to encircle or surround. In other words, anything that surrounds us, forms our environment. Look around and observe the things that surround you. The plants, animals, school playground, roads are all part of our environment. We can classify environment into two types:

a) Natural environment

b) Man-made environment



The natural environment consists of those things that are created by nature, like water, air, land, forest, etc. On the other hand, man-made environment consists of those things which are made by man, like bridges, parks, colony, schools, etc.



Activity-1

Natural vs. Man-made

- Classify the following into natural or man-made environments:

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- River Island
- Metro
- Highway
- Forest
- Fort
- Airport
- Sea beach
- Aquarium
- Zoological garden
- Archipelago

Components of environment

Our environment is our surrounding and it is because of this that we are able to survive on Earth. As discussed above, our environment could be natural or man-made. In both the cases, the environment has two components: Biotic and Abiotic.

- Biotic components include all living things, like plants, animals, humans, etc.
- Abiotic components include all the non-living things like soil, air, water, etc.

Both the biotic as well as abiotic components are inter-dependent on each other. For example, soil, air and water are abiotic components which help to support plants. On the other hand, a plant is a biotic component which helps in balancing the gases of the atmosphere (air).

Activity-2

Biotic and Abiotic

Classify the following into biotic and abiotic components of the environment:

	Biotic or Abiotic
Tree	
Buffalo	
Rose	
Butterfly	
Cow	
Humidity	
Light	
Heat	
Man	
Soil	
Pond	

Our natural environment

We have earlier read about Lithosphere (land), Hydrosphere (water) and Atmosphere (air). Land, water and air are the 'natural' abiotic components of our environment. Let us recap the main points.

Lithosphere (Land)

The solid crust of the Earth is known as 'The Lithosphere'. The word lithosphere has been derived from the Greek word *lithos* which means 'stone'. The Earth is made up of rocks and minerals. It is covered by a layer of rich soil. Lithosphere is the part of Earth where we can stand, build houses and grow plants. Some parts of lithosphere have rich mineral deposits which are extracted and used by humans.

Lithosphere is not the same throughout the Earth. It is very irregular. At some places, it is elevated whereas at some places it is flat. Hence, Earth has various landforms like mountains, plateaus and plains.

Hydrosphere (Water)

The liquid component of Earth is known as *Hydrosphere*. The word hydrosphere has been derived from the Greek word *hudor* which means water. Our hydrosphere includes oceans, seas, lakes, ponds, rivers and streams.

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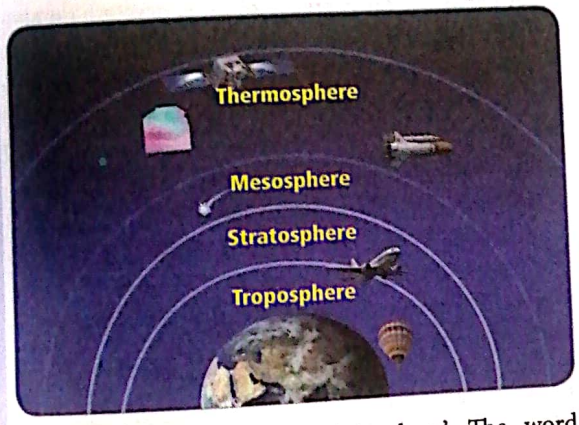
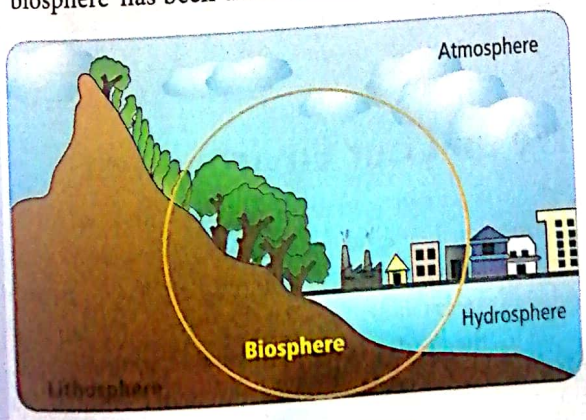
Atmosphere (Air)

The layer of air that surrounds the Earth is called 'Atmosphere'. The word atmosphere has been derived from the Greek word *atmos* which means vapours. Atmosphere plays a very important role by providing the right mixture of gases required by various life-forms. It also shields us from harmful radiation coming from the Sun.



We have also read about 'Biosphere'. The word 'biosphere' has been derived from a Greek word *Bios* which means 'life'. Hence, biosphere is that narrow zone where we find land, water and air. It can also be called the 'zone of life' on Earth. This is the place where life exists.



Adaptation to the environment

All of us including plants and animals must adjust to the environment in which we live. The special characteristics that enable plants and animals to survive or live in a particular environment are called 'Adaptation'. Adaptation is what makes it possible for a living thing to live in a particular place. Camel which is found in the desert is a classic example of adaptation. A desert is a very hot place where water is scarce. Camels have humps on their backs which store large amounts of fatty tissues. In the dry weather conditions of a desert, the camel may have to go several days without food or water. During this time, this fat acts as a source of energy and the camels body also converts into water. This is why the camel is also called the 'ship of the desert'. Similarly the cactus plant frequently found in desert areas has a fleshy stem to store water. Even its leaves have evolved into tiny thorns or spines which reduces the plant's water loss during transpiration.

Quick Facts

The kangaroo rat found in the desert regions of western North America, has perfectly adapted itself to survive in the desert. It can survive without drinking water. They can derive the moisture needed from their seed diet. They even have specialised kidneys which allow them to dispose of waste materials without water.

Some plants and animals are so environment-specific that they cannot survive in other places. For example,

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polar bears cannot survive in warm climates. Another example is fish. Water is the natural environment for fish. If you try to make fish survive on land they will die. This is because the changed environmental condition is not suitable for the survival of the fish. Can you think about other such animals or plants which have adapted completely to their environment?

Ecosystem

All living beings including plants, animals and human beings (biotic components) depend on their immediate surroundings (abiotic components). In other words, both biotic and abiotic components are interdependent on each other. Biotic and abiotic components combine to create a system which is known as the 'Ecosystem'. An ecosystem is a community of living and non-living things which interact with each other and function as a unit. Step out of your house or school and note your surroundings. You will see living things (biotic components) like people, birds, plants and insects. You will also see non living things (abiotic components) like soil, rocks, concrete, etc. An ecosystem will contain both living and non-living components. For example, a garden is an ecosystem which has plants, trees, rocks, birds and people. In this ecosystem (garden), all the living things and non-living things continuously interact with each other. For example, trees and plants need the support of the soil to grow. On the other hand, trees provide shelter to birds.

Quick Facts

Even your mouth is an ecosystem. Your mouth is a home to many bacteria, viruses, fungi, and protozoa. It has been estimated that there are over 100 million bacteria in every millilitre of saliva.

Ecosystems can be small or large. They can exist on a variety of scales. An example of a small scale ecosystem is a 'pond'. A pond is an ecosystem which has biotic (fish, algae, etc) interacting with the abiotic component (water and soil). Some examples of large scale ecosystems are desert, mountain, etc.

The earth has many different ecosystems, and each one has its own climate, soil, plants and animals. Some are man-made while others are natural ecosystems. For example, an aquarium is a man-made ecosystem while a pond is a natural ecosystem. Can you think of some other man-made and natural ecosystems?

Activity-3

My beautiful garden!

A garden is an example of an ecosystem on a small scale. Look around in your garden and list down the biotic and abiotic components that you find there.

Biotic components	Abiotic components

We and our Environment

Several years ago, man depended on plants and hunted animals for their food. He adapted to the environment and led a very simple life. He fulfilled his needs with whatever was available around him. However, as time went by, the needs of humans grew and became varied. Man learnt to grow crops, make better weapons to

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meet his growing
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hunt and slowly started modifying the surroundings to meet his growing demands. The wheel was discovered, electricity was invented and demand for more space for industries and better lifestyle grew. However, in the process man started cutting trees to put up factories and houses, without realising the long term effects of his acts. We have focused on creating everything 'new' around us, and ignoring what we already have and are losing very fast — 'nature'.

Everything in this world has a balance. In an ideal world, we can all live together with plants and animals without disturbing each another. This is known as Ecological balance. Recently, a lot of studies and research has been carried out to understand how man is affecting the environment. Research shows humans are responsible for causing rising air pollution, deforestation, acid rain and other problems which are not only dangerous to the environment around us but also our own physical health. For example, excessive cutting of trees (called deforestation) has disrupted the natural habitat of many animals. This activity has led to changes in climate as well. Temperatures in summer are rising to much higher levels than before. This is due to the phenomenon known as global warming. Global warming is the rise in temperature of the Earth's atmosphere. Trees and plants maintain the balance of gases in our atmosphere. Excessive cutting of trees leads to disturbance in our atmosphere. Due to the decrease of trees and forests, there is a rise in the level of carbon dioxide. This results in trapping of more of the heat from the Sun rays, thereby increasing the overall temperature of Earth.

Deforestation

Have you heard about the gas leak which occurred in Bhopal in December 1984? The leakage of Methyl Isocyanate (MIC) gas from the Union Carbide factory crippled human and animal life there. The adverse effects of that gas can be seen even today. Similarly, a massive earthquake in Bhuj, Gujarat, in the year 2001 damaged human, animal and plant life completely in the region. Other natural calamities, like floods, volcanic eruptions and cyclones cause a lot of damage to life all around. These are natural disasters over which we have no control.

However, some kinds of changes in the habitat are brought about by human beings for their own selfish gains. Activities such as, deforestation, use of chemicals as pesticides and repellants, industrialisation, mismanagement of industrial waste, automobiles, hunting and fishing and use of nuclear weapons are some examples.

It is very difficult to control natural disasters such as forest fires, floods, storms, tsunamis, volcanic eruptions, etc. However, we need to do our part now by becoming more responsible towards our environment and nature if we wish to enjoy this beautiful gift for a long time to come.

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Activity-4

Environment day!

Environment Day was started in 1972 by the United Nations General Assembly. It is celebrated every year on 5th June. The aim is to increase awareness about environmental issues and to encourage actions that can safeguard natural resources. Each year, Environment Day has a particular theme. For example: the theme for the year 2007 was 'Melting Ice'. This theme was chosen in order to focus attention on how global warming affects the ice and snow covered areas of Earth. *Browse the internet and encyclopaedia to find the themes for last year and this year.*

Activity-5

Save our Environment!

List any four human activities that are affecting the natural habitat adversely.

1.

2.

3.

4.

Summary

- The surroundings and conditions in which we live constitute our 'Environment'.
- Biotic component includes all living things Like, Plants, animals, humans, etc.
- Abiotic component includes all the non-living things. For example, soil, air, water, etc.
- The solid crust of the Earth is known as 'Lithosphere'.
- The liquid component of the Earth is known as 'Hydrosphere'
- The sphere of air that surrounds the Earth is called 'Atmosphere'.
- Biosphere is that narrow zone where we find land, water and air. It can also be called as the 'zone of life' on Earth.
- The special characteristics that enable plants and animals to survive or live in a particular environment is called 'Adaptation'
- Biotic and abiotic components combine to create a system which is known as 'Ecosystem'.
- Environment Day was started in 1972 by the United Nations General Assembly. It is celebrated every year on 5th June.

Exercises

1. Choose the c

(a) Which one of these
(i) Tree

(b) Which is not a natu
(i) Desert

(c) Which one of these
(i) Soil

(d) Which of the follo
(i) Soil

(e) What does the ter
(i) Air

(f) Which one of the
(i) Agriculture

2. Match the

(a) Tree

(b) Biotic compon

(c) Abiotic compo

(d) Lithosphere

(e) Hydrosphere

(f) Biosphere

3. Fill in the

(a) The surroundi (environment

(b) The solid crus

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Exercises

1. Choose the correct option.

(a) Which one of these is a part of our natural environment?
(i) Tree (ii) Road (iii) Schools (iv) Houses

(b) Which is not a natural ecosystem?
(i) Desert (ii) Pond (iii) School garden (iv) Ocean

(c) Which one of these is a abiotic component?
(i) Soil (ii) Rose plant (iii) Microbes in soil (iv) Cow

(d) Which of the following a biotic component?
(i) Soil (ii) Rose plant (iii) Rainwater (iv) Oxygen in air

(e) What does the term 'Lithosphere' mean?
(i) Air (ii) Water (iii) Land (iv) None of the above

(f) Which one of these is an example of a small ecosystem?
(i) Agriculture field (ii) River (iii) Aquarium (iv) All of the above

2. Match the columns.

Column A	Column B
(a) Tree	(i) Land
(b) Biotic component	(ii) Water
(c) Abiotic component	(iii) Rubber
(d) Lithosphere	(iv) Life
(e) Hydrosphere	(v) Non-living things
(f) Biosphere	(vi) Living things

3. Fill in the blanks.

(a) The surroundings and the conditions in which we live, constitute our _____. (environment/lithosphere)

(b) The solid crust of the Earth is known as_____. (lithosphere/hydrosphere)

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(c) The liquid component of the Earth is known as_____. (hydrosphere/atmosphere)

(d) The layer of air that surrounds the Earth is called_____. (atmosphere/hydrosphere)

(e) _____ is also called the 'Zone of life'. (Biosphere/Atmosphere)

(f) The special characteristics that enable plants and animals to survive or live in a particular environment is called _____. (environment/adaptation)

4. Differentiate between the following:

(a) Lithosphere and Atmosphere

(b) Biotic and Abiotic components

5. Put a (✓) mark if the statement is correct and (✗) if incorrect.

(a) The atmosphere shields us from harmful radiation coming from the sun.

(b) Polar bears can adapt themselves to survive in the desert area.

(c) A garden is an example of a man-made ecosystem.

(d) The process of plantation of trees is known as deforestation.

(e) A bacterium present in the mouth is a biotic component.

6. Identify the pictures given below and answer the questions.

List the biotic components that you can see in this picture:

_____

List the abiotic components that you can see in this picture:

_____

What do you see in this picture?

_____

Why is this activity harmful for our environment?

_____

7. Group Discussion

Have a group discussion on: 'World Environment Day'. Do you think it is important to celebrate this day? How are you celebrating World Environment Day this year? Be creative and think of some interesting themes for the Environment day.

8. Project

(a) We can all do our
make a big differe

(i) We can ch

(ii) Lower the

(iii) Use recycl

Divide the class
the environment

9. HOTS

(a) Why is the entir

(b) You have read t
reaching us on

10. Short ans

(a) Define environ

(b) What do you u

(c) Define the foll

(i) Ecosyste

(ii) Adaptati

(d) What is hydro

(e) What is biosp

11. Long an

(a) What are the

(b) How has ma

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8. Project

(a) We can all do our bit in making this planet a better place. There are many small things you can do that can make a big difference. For example:

(i) We can check water wastage at home

(ii) Lower the use of air conditioners

(iii) Use recycled products

Divide the class into groups of ten. Each group must list down small steps that can be taken by us to save the environment. Compare and discuss the different points listed by all the groups.

9. HOTS

(a) Why is the entire world trying to reduce the use of vehicles that use petroleum products as fuel?

(b) You have read that sunlight is essential for life on Earth. Why is the entire world worried about Sun's rays reaching us on Earth?

10. Short answer questions.

(a) Define environment.

(b) What do you understand by biotic component?

(c) Define the following:

(i) Ecosystem

(ii) Adaptation

(d) What is hydrosphere?

(e) What is biosphere?

11. Long answer questions.

(a) What are the components of an environment?

(b) How has man modified his environment?

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