
UNIT 5 OUR LIVING WORLD

Structure

- 5.1 Introduction
- 5.2 Objectives
- 5.3 Characteristics of Living Things
 - 5.3.1 Growth
 - 5.3.2 Respiration
 - 5.3.3 Feeding and Nutrition
 - 5.3.4 Movement
 - 5.3.5 Response to Stimulus
 - 5.3.6 Reproduction
- 5.4 Structure and Adaptations in Plants and Animals
- 5.5 Care and Protection of Animals and Plants
- 5.6 Let Us Sum Up

5.1 INTRODUCTION

We may begin this unit with a question. How are the living things distinguished from non-living things? One answer could be that living things are able to perform certain life functions or life processes. For instance, movement is one such process. Feeding, respiration, growth and reproduction are certain other processes. Non-living things do not perform all these functions. Of course, a crystal can grow or a machine can move. But it is only living organisms that can perform all of these processes.

Essentially plants and animals are living things. They occupy various environments. They are well adapted to the environment in which they live. Plants and animals living in a particular environment have specific roles to perform. Plants and animals are our biological resources. It is our duty to protect them from being destroyed.

This unit aims at imparting to you certain concepts and activities that would help you to make your students understand the characteristics of living things, differences between plants and animals, ability of plants and animals to adapt themselves to the environment and the need to protect plants and animals from destruction.

5.2 OBJECTIVES

After studying this unit, should be able to help your students to:

- distinguish between living and non-living things;
- list the characteristics of living things;
- be able to think and perform certain activities that would provide evidence for life processes;
- analyse the relationship between habitat and structural adaptations of organisms;
- discuss the concept of conservation and protection of plants and animals, and emphasize the need for such conservation and protection.

5.3 CHARACTERISTICS OF LIVING THINGS

At the beginning of this unit we stated that living things are characterised by certain life processes. These include movement, ability to respond to changes in environment, feeding or nutrition, respiration, excretion, growth and reproduction. A visit of your students to a garden or a park will make them appreciate nature and living things. You may invite their attention to a wide variety of living things available there. Insects, birds, garden lizard, squirrel, various types of plants, like, herbs, shrubs and trees - are some of the living things they could identify in a garden. They may identify certain non-living things as well. In fact they should make a list of all living things they see there. Garden or a park is also the right place where they could observe a few of the characteristics of living things: For instance, they may observe animals feeding, one of the characteristics of living things. Growth, as stated earlier, is another characteristic of living things. You may demonstrate to the students the characteristics of life by making them perform several simple activities. We shall begin with one of the characteristics, namely growth, and then continue with others.

5.3.1 Growth

Activity 1

Tie a cardboard scale to a potted plant in the garden with a small piece of thread (Fig. 5.1). Measure the height of the plant. Visit the garden every third day for two weeks and record the height of the plant. Do you observe changes in the height of the plant? How would you interpret your results? Do you think such changes would occur in a stone or a piece of wood found in the garden?

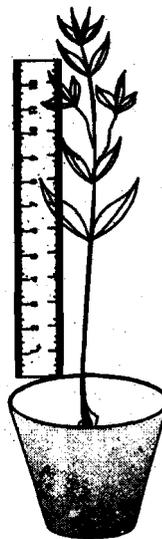


Fig. 5.1 : A potted plant with a cardboard scale tied to it with a small piece of thread

Activity 1 illustrates that growth is a characteristic of living things.

Growth can be defined as increase in the size of organism arising from the synthesis of new materials in the body of the organism.

Activity 2

You may illustrate growth to the students by another small experiment. Take a petri dish. Make a wet bed of cotton in the bottom of the dish. Leave a few (10-12) green gram grains (whole moong dal) in the wet bed of cotton. Observe every 24 hours for nearly five days. Make sure that the cotton bed is always wet. After 48 hours you would observe that the grains have sprouted and after five days the sprout appears considerably long signifying growth.



Fig. 5.2 : An experimental set-up for the sprouting of green gram

Activity 3

You may show the students pictures of plants and animals including man in various stages of growth. As stated earlier growth is increase in the size of the body, be it a plant body or a human body.

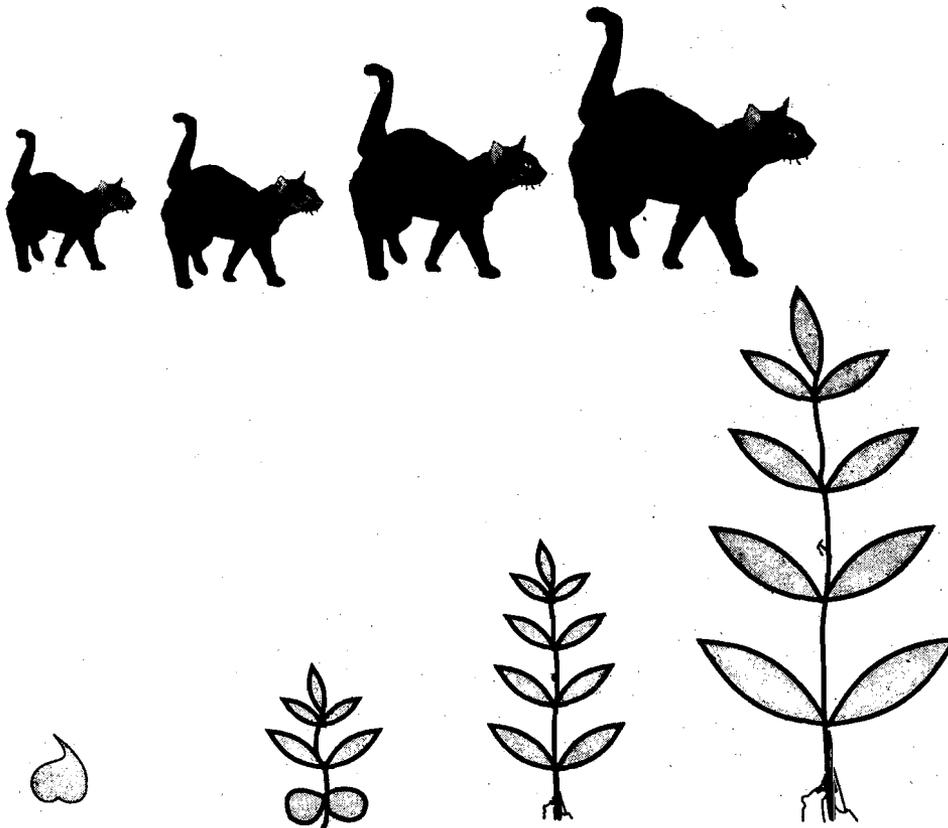


Fig. 5.3 : Pictures of plants and animals in different stages of growth

Points to ponder

Make the students think as to how the increase in the size of the body occurs. And what are the inputs required for growth?

The students should also observe the differences between the growth of a plant and that of a human being from the pictures you show to them. One major difference is that whereas growth in a human being is highly structured, that of the plant is continuous.

A branch of a plant has the capacity to grow again when it is cut and removed from the plant. Can a human hand grow when it is cut and removed? Are there any parts in human body that can grow when they are cut and removed? Do you know that some animals when they are cut into halves, each half can generate the lost part and become an entire animal? Can you name any such animals? You must have seen a wall lizard that loses its tail accidentally and is able to re-grow it.

Activity 4

Let us illustrate another aspect of plant growth. Take two potted plants of the same variety and label the pots as A and B. Let the pot A be placed in its normal vertical position; but tilt the pot B to 90° and place it horizontally. Let the students observe the plants after nearly two weeks.

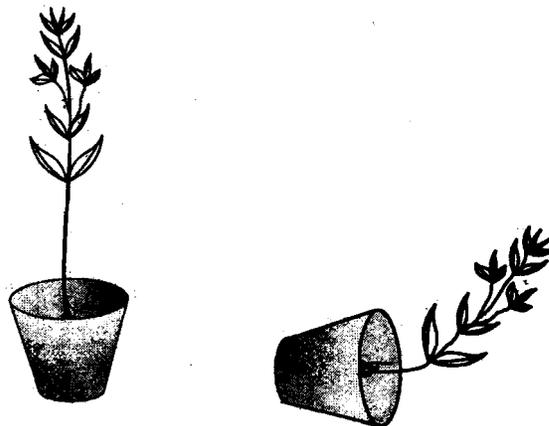


Fig. 5.4: Aerial parts of the plant grow away from earth and towards light

The following questions may be put forward to generate a discussion among the students?

- What differences are observed between the two potted plants?
- How would you explain the upward turn of the plant observed in pot B?

Points to ponder

Let the students be made to infer that the upward turn of the plants signifies two things.

1. The aerial parts of the plant, the stem and leaves, have the tendency to grow away from earth.
2. Or, the aerial parts of the plant have a tendency to orient towards sun or light.

Alternately, the underground parts of the plant, the roots, tend and move into earth and away from light. What could be the possible reasons for such movements?

So far we have discussed one characteristic of living organisms namely growth. Let us look into another characteristic - the ability to respire.

5.3.2 Respiration

Living things require oxygen to stay alive. All living things, with a very few exceptions, are constantly taking in oxygen into their body. Oxygen is selectively picked up by the body from the air that enters into it. Oxygen is utilised in the body, converted into carbon dioxide and released outside the body. The physical process of taking in oxygen and releasing carbon dioxide is what is known as breathing. Respiration is a biological process which signifies the utilisation of oxygen in the body. For the students of primary classes, let us use the two terms interchangeably. Students may observe the breathing process by looking at the movement of their chests. The up and down heaving movements of the chest indicate the taking in of oxygen and releasing of carbon dioxide respectively. They may also hold their nose tightly and keep the nostrils and mouth closed for a few seconds. Students may be asked to express what happened when they did so? A student may be asked to run a distance of 100 meters as fast as he could. At the end of the run, the students may be asked to observe the hard breathing of the runner and questioned the reason for his hard breathing.

Let us demonstrate that breathing process involves taking in of oxygen and release of carbon dioxide.

Activity 5

Prepare a set-up as shown in Fig. 5.5. All that you require for this set-up is two conical flasks, 2 two-holed rubber corks, two one holed rubber corks, and some bent and straight glass tubes. Lime water, chemically known as calcium hydroxide is also required.

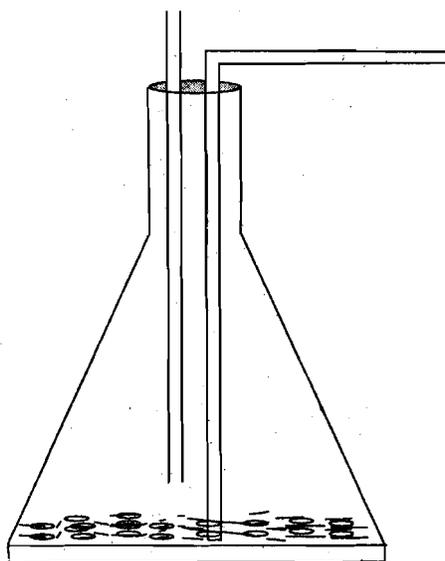


Fig. 5.5 : An experimental set-up to show that carbon dioxide is exhaled during respiration

Suck in the air by placing the mouth at A for 20 seconds. The sucking-in action represents inhaling of air. Observe what happens to the lime water during inhaling. Record your observations. Next, blow gently by placing the mouth at A for twenty seconds. This action represents exhaling. Again record your observations. You will find that during exhaling process, the lime water has turned milky. Lime water turns milky when it comes into contact with carbon dioxide. This essentially suggests that during exhaling carbon dioxide is released. Air drawn during inhaling contains very little carbon dioxide but the air released during exhaling contains 130 times more carbon dioxide than present in the inhaling air.

Like human beings and animals, plant also respire. They also take in oxygen and release carbon dioxide.

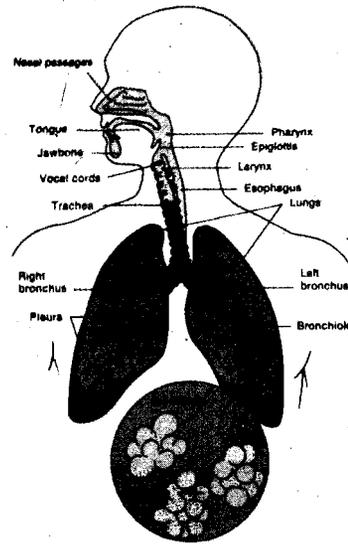


Fig. 5.6 : Lungs in human body

The students may be questioned about the respiratory organs of human beings, an insect and a plant. In human beings the lungs are the respiratory organs. Insects have tubular respiratory structures, called trachea and plants have very tiny openings on the underside of the leaves called stomata through which air enters into the plant.

5.3.3 Feeding and Nutrition

Students may be made to realise that nutrition is an essential aspect of life and all other life activities depend on nutrition. You may provide the analogy between a life machine and an automobile. Food to organisms is like fuel to an automobile. Even as the petrol is burnt to drive a car, the food is 'burnt' inside the body to release the energy for carrying out the various activities like movement, growth, respiration, reproduction etc., Some organisms, especially plants, are capable of synthesising or preparing their own food. Students may be briefly told about photosynthesis by plants. Plants require water, carbon dioxide, sun light and the green pigment — the *chlorophyll* for the preparation of one type of food - the starch. At the end of the briefing you may begin a discussion with the students on photosynthesis with the following questions.

- Name the part or parts of a plant that are helpful in the preparation of food?
- Why are the leaves of a plant green in colour?
- How do the plants get water necessary for preparing food?
- From where do they get the carbon dioxide?
- Can plants prepare food in the night? Why not?
- Name the green pigment where the preparation of food occurs.
- Can you name some food materials that are rich in starch?
- Can you name some plants that do not have green pigment in them?
- In the absence of green pigment, how do they obtain their food?

The students may be told that not all plants can prepare food. Plants which are not green or those that do not have chlorophyll cannot prepare food. For instance a group of plants called moulds or fungi do not contain chlorophyll and therefore have to depend on other plants or food materials. Mushrooms are one such group of organisms. It may be brought to the attention of the students that bread slice kept stored in their houses for a week or so show a layer of growth and also smell foul. This layer is the bread-mould which grows using the bread as food. Some moulds live in the company of green plants and use the food synthesised by these plants for their own growth.

Animals depend on plants or on other animals for their food.

Is it possible for any living thing to live without food? The answer is essentially 'no'. As stated earlier all life activities require energy and the energy is provided by the food taken in.

- What is the food available to a developing chicken inside an egg?
- You may have heard about round worms living in the stomach or intestine of young children, What do these worms feed on ?
- What type of food do you eat and where do you get it from?
- Which animals provide you eggs and meat? And milk?
- What do animals like cow, buffalo and elephant feed on?
- What is the food of animals like lion and tiger?

Points to Ponder

Students should be able to comprehend that plants can prepare their food by a process called photosynthesis using carbon dioxide, water, sun-light and the green pigment, the chlorophyll. Animals obtain their food from plants and other animals. Certain plants which cannot prepare their food depend on other plants or use decaying organic substances for food. Certain plants and animals live on other living organisms and are known as parasites. And, invariably all living organisms require food for carrying out life activities.

5.3.4 Movement

Movement or locomotion is yet another characteristic of the living world. Of course, there are many sedentary or stationary organisms. Plants in general do not move from place to place. Movement from one place to other, you can say, is

more a characteristic of the animal world. And animals exhibit different types of movements depending on the type of habitats they occupy. In other words, structures which aid in movement are modified in different groups of animals to suit the needs of environment in which they live. Let the students describe the type of movement exhibited by the following animals.

An earthworm, a cockroach, a butterfly, a snail, a frog, a wall lizard, a turtle, a snake, a crow, a whale, a cat, a horse, a man.

5.3.5 Response to Stimulus

Yet another characteristic of living things is their ability to respond to stimulus. What is a stimulus? Any action that evokes a response may be described as stimulus. All living things are capable of evoking such a response. Students may have known about the plant called 'touch-me-not'. As soon as this plant is touched, the leaves of the plant tend to close. The touching action is the Stimulus. The closing of the leaves is the Response. Let the students list some of the stimuli and response situations. Some of the stimulus-response situations are described below.

Stimulus	Response
Pinching	Pain
Accidental stepping on a thorn	Pain and immediate withdrawal of the feet
A fly sitting on the body of a cow	The movement of the tail or shaking of the head to drive away the fly
The stone-throwing action of a boy at a dog	The frightened posture of the dog taking on its heels
The rising of the early morning sun.	The blossoming of the lotus buds.

Activity 6

The following experiment will help the students appreciate the stimulus-response situation. Cut a window on one side of a big cardboard box which is otherwise closed on all other sides. Place a potted plant inside the cardboard box and place the entire set-up near a window. Let the students observe the plant after a week or ten days and record the observations.

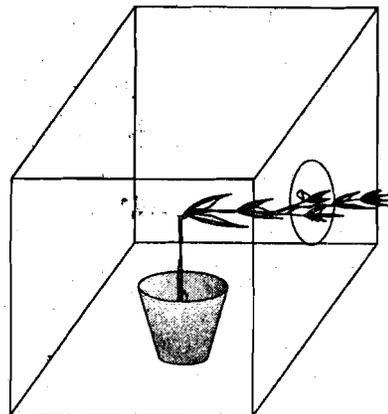


Fig. 5.7 : A set up to illustrate stimulus-response situation

Based on the experiment, discuss the following:

- Is the plant growing in any specific direction? If so, in which direction?
- What is the reason for the growth of the plant in one particular direction.
- In this experiment what is the stimulus and what is the response?

Points to ponder

What is responsible for the stimulus-response situations?

Are there any organs in the body which control such stimulus-response reactions?

Are these organs present throughout the living world? And are these organs confined only to animals.

The students should be briefly told about the nervous system, more specifically the brain, the nerves and the sense organs. They should be made to comprehend that the nervous system responds to various types of stimuli.

5.3.6 Reproduction

Life begets life, it is said. Reproduction is characteristic of living organisms essential to the continuation of life. Students may be made to comprehend that both plants and animals reproduce. And reproduction results in giving birth to young ones of the same kind. A cat gives birth to a kitten and an elephant gives birth to a baby elephant. Such a process ensures that there is a continuity of life. Students may also be told that some animals may produce young ones that may not resemble their parents initially. Such young ones undergo certain changes in their appearance before they finally assume the appearance of their parent. Frog and butterfly are examples of such animals. These changes are collectively called metamorphosis. Another point that may be brought to the attention of the students is that in many plants reproduction is much more simple.

A new plant may be generated by cutting and planting a shoot in the soil. Is such a process possible in animals?

Activity 7

Prepare charts showing adults and young ones. For instance, a cat and a kitten, a dog and a pup and a tree and a seedling. Also the life cycle of butterfly can be prepared in the chart form. The four stages in the life cycle can be depicted - the egg, the larva, the pupa and the adult to illustrate the concept of metamorphosis.

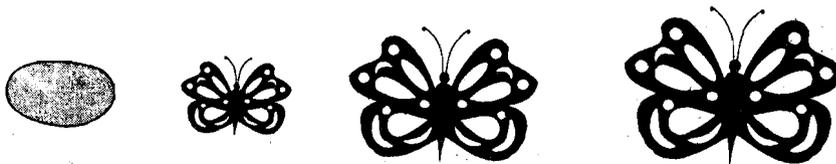


Fig. 5.8

We shall end our discussion on characteristics of living organisms and begin a brief study of structure and adaptations of living organisms.

Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of this unit.

1. How will you demonstrate to your students that growth takes place in plants and animals?

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2. Lime water turns milky during exhaling process. What does this indicate? How will you demonstrate your conclusion through an experiment?

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3. What is a stimulus and what is a response? Can this be shown with the help of an experiment?

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4. List out the major characteristics of living beings.

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5.4 STRUCTURE AND ADAPTATIONS IN PLANTS AND ANIMALS

In the last section we studied certain features that are very characteristic of living organisms. These characteristics are common to millions of species of organisms that occupy this earth. Whereas these characteristics are common to all living things, it is also to be realised that there is a lot of diversity in life. This diversity manifests in a number of ways. Organisms may be plants or animals. Organisms may be formed of single cell or they could be formed of many cells. They may have a vertebral column (the back bone) or they may not have one. They may live in water or on land. If they live in water, they may live in fresh water or in sea water. If they live in fresh water, they could live in a pond or in a river. If they live in sea, then they could live on the shore or they may occupy deep sea. If they live on land, it is possible they occupy grassland or a mountain or a desert or a forest. Within these habitats there are finer divisions, and organisms, in fact, develop special body parts or structures to occupy the right environment that suit most to their life. The ability of an organism to adjust to the environment or the place in which it lives, to lead a successful life can be called adaptation.

It would be better for the students if they visit the nearest museum and have a look at different organisms. Museums generally have all kinds of plant and animal collections and a visit to the museums will provide the students a first hand knowledge of the variety of organisms that exist in the world. In a situation where this visit is not possible; another activity could be to bring some of the live organisms to the classroom and have a discussion about these organisms. The following activities exemplify such situations.

Activity 8

Show live specimen of a fish to the class. Leave the fish in a glass jar containing water. Let the students try to identify the various organs of the fish - eyes, operculum, fins, gill, etc. Ask them the following questions:

- Where do the fishes live? On land or in water?
- Name some other animals which live in water?
- Do fishes live in ponds, lakes and rivers or do they live in sea? Or both?
- A fish is used to living in river and is transferred to sea. Will the fish live there?
- What are the structures used by the fish for its swimming movement?
- How does a fish breath?
- Land organisms take in the oxygen from air From where does the fish get its oxygen?
- Do you think that the shape of the body of a fish is suited for its swimming? What is the shape of a fish body?

Points to ponder

Your students may not be able to reply all the above questions. You may help them to comprehend that fishes have spindle-shaped (narrow at end but broad in the middle) and streamlined body that enables them to swim freely in water; that fishes have gills as respiratory organs and that fins aid in swimming. These are some of the special structures that the fishes have developed, so that they are well adapted to live in water.

Next, the students may be introduced to an organism that is capable of living both in water and on land. You may remind the students that during rainy seasons they might have listened to a series of croaking sounds in the night, particularly if they live close to a water body such as a pond. These sounds are made by the frogs that live in water. Students might have also noticed frogs hopping in a garden or a grassland during winter nights. Does this mean that frogs live both in water and on land? Yes! The frogs generally live on land but return to water for reproduction. They lay their eggs in water. They are adapted to live in both the environments. You may bring a live frog to the class, leave it in a glass jar and ask the students to observe the frog carefully.

- Frog lives in water and on land. Does this mean they have separate structures for breathing in water and on land? Or is the same organ used for breathing in both the media?
- How do they swim while living in water? And move on land?

- Do you find the forelimbs of frog short and hindlimbs very long? How does such arrangement help the frog?
- Why should a frog live both on land and in water?

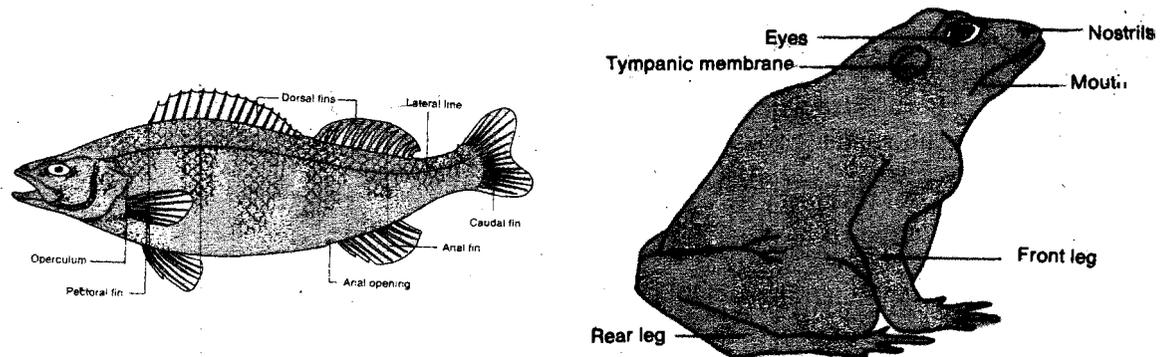


Fig. 5.9 : (a) A Fish (b) A Frog

Points to ponder

The students should be made to infer that the skin of the frog is capable of breathing. And the skin is always moist for this purpose. Also the frog has lungs that aid in respiration, particularly while living on land.

A close look at the structure of the limbs reveals that the short forelimbs and the long hindlimbs are highly adapted for hopping or jumping type of movement. And the presence of web at the hind feet is suitable for swimming in water.

Frogs have to live in water for the purpose of reproduction. Frogs cannot lay their eggs on land. Remind the students of a hen's egg. It has a thick shell around it. But frogs do not cover the eggs with a shell similar to that of a hen. Therefore if the eggs are laid on land they will become dry and will not be able to hatch. This is the reason why the eggs are laid in water.

Ask the students to name some animals (not the birds) that can lay their eggs on land. Find out if they can name an animal that lives in water but comes to the land to lay eggs?

You may also bring a caged bird and a white rat to the classroom and students may observe the various body parts in them.

Let the students visit a nearby water body - a pond or lake and look for some plants that live in water. Lotus, Lily, Hydra, and water hyacinth (*Eichhornia*) are some plants that may be found in water. Ask the students to observe that the water plants generally float and are not submerged in water.

- Can the students explain how the floatation is achieved?
- And what is the necessity to float?

Points to Ponder

The plants are able to float because the cells present in the leaves and stem are filled with air. These are the special types of cells that help the plant to float in water without being submerged. It is necessary that these plants float so that the leaves prepare food using sunlight.

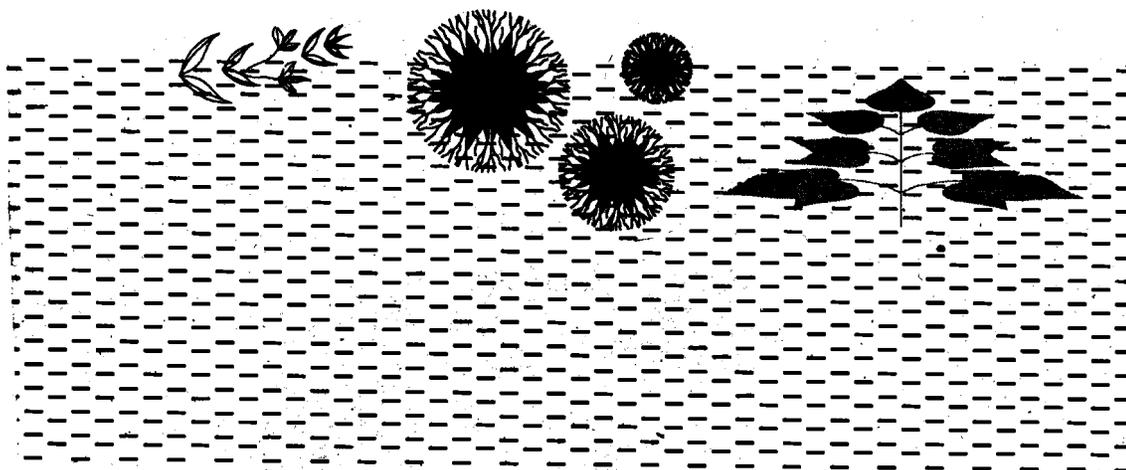


Fig. 5.10 : Some of the aquatic plants floating in water

A visit to a park, a garden, a zoo, an aquarium or a botanical garden will give the students an idea of the different varieties of plants and animals that live on this earth. Earlier we mentioned the different types of habitats that plants and animals live in. Each type of organism has acquired several adaptations to live in a particular habitat. For instance, the fish has the right adaptations to live in water. Remember that fish cannot live on land. This is because it does not possess the right type of adaptations to live on land. Similarly the frog has acquired adaptations to live both in water and on land. Some aquatic plants have adaptations to remain floating in water. What are adaptations in general? Adaptations are essentially changes in the structure and organisation of the body part of plants and animals that enable them to live in a particular environment.

Ask the students if they have seen grasshoppers and butterflies in the gardens. Surely, they should have. Ask the students to list some of the adaptations that the two types of insects possess for their respective ways of a life.

A camel is a desert animal. First describe the desert to the students. Long stretches of sand, non-availability of water, extreme weather conditions - very hot days and very cold nights, very limited vegetation etc., Show the picture of camel to the students. Is it possible to project a 2" × 2" positive slide of a camel on the wall of your classroom?

- What are the adaptations required in a camel to live in a desert environment?
- Let the students observe the feet of the camel. The feet of the camel are suitably modified to run in sandy desert.
- Camel is often described as the ship of the desert. Why?
- It is said that camel can live without water for many days. How?

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Points to ponder

The body of the camel is highly suited for a life in desert environment. The padded feet, hump and water sac are some of the structures that help the animal to live in a hostile desert environment. Camel is one of the many animals that live in a desert environment. There are plants which can live in a desert environment. These plants have certain adaptations that make them live in an environment almost devoid of water. What are the adaptations of desert plants that make them survive in dry environments? Let the students perform the following activity to infer that the desert plants require minimal water for their survival.

Activity 9

Take two potted plants - a garden plant and a cactus and name these plants respectively as A and B. Initially the two plants should be watered for a week to ten days regularly. After this period stop watering both the plants. Observe the plants after a week.



Fig. 5.11 : A set up to show that desert plants survive dry conditions

Points to Ponder

Does your observation show that the garden plant tends to wither in the absence of water but the cactus appears to be normal. Have you made the following observations in a cactus?

- There are no leaves on the plant.
- The stem is flat, succulent and green in colour suggesting a role in photosynthesis.
- There are thorns all over the stem and these thorns are modified leaves.

Why are the leaves not found in desert plants? Leaves are the organs through which water is continuously lost from a plant. In order to prevent the water loss, desert plants do not have leaves in them. But leaves contain the green pigment chlorophyll and they prepare food for the plant. In the case of desert plants the flat stem is green in colour, contains chlorophyll and prepares food. The fleshy stem suggests that it is a water storing organ as well. These adaptations make the desert plants live in dry environments.

Besides the desert habitat, the students should be told about the other terrestrial habitats- the mountain, forest, grassland, etc.. For instance, while talking about the mountains, in your region, students should be able to recall the plants and the

animals living there. The students may be shown the pictures of mountains with characteristic plants and animals living in them. Mountain goats, yaks, sheep, squirrels and insects like butterflies are some of the animals living in mountains. Tall growing trees like pine are quite common in mountains. By looking at the pictures of these animals and plants the students should be encouraged to talk about the adaptations of the organisms to mountain environment. The mountain organisms are provided with thick furs on their body so that they could be protected from extreme cold conditions prevailing there. Because of the presence of rich vegetation, herbivores (plant eaters) dominate the mountain environment. The leaves of the plants are modified into needle-like structures or highly dissected to provide least resistance to strong winds in the mountains.

The students may be encouraged to construct a terrarium and observe the movements of small animals such as earth worm, snail and toads in it. A terrarium mimics a natural environment with small plants, soil living animals and small land and amphibious animals. The following procedure may be followed to construct a terrarium.

Activity 10

Materials required: A big plastic can, sand, small pebbles and stones, charcoal, garden soil, leaf mould, white transparent plastic sheets/polythene bags, a knife.

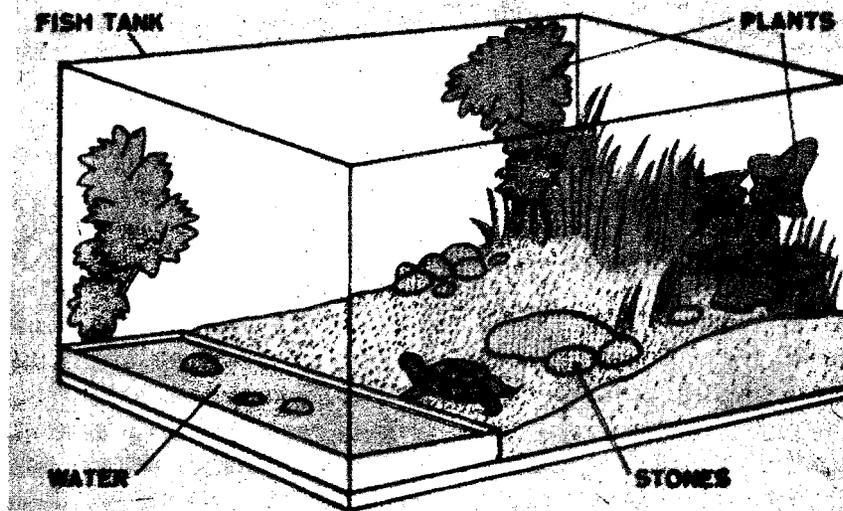


Fig. 5.12 : A terrarium

Clean the can thoroughly and cut windows on each of the broad side of the can using a sharp knife. With the help of the knife, remove the top of the can where the narrow mouth is located so that you get a broad opening at the top. Cover the windows on the sides with white transparent plastic sheet, so that the students can see through them. Lay at the bottom of the can a mixture of small stones and pebbles to a height of 3 to 4 centimeters. A handful of small pieces of charcoal may also be used. Overlay the stony bottom with two parts of garden soil, two parts of coarse sand and one part of leaf mould. Do not use rich garden soil only. The soil should be arranged in a slope on the side of the can to provide a landscape. Avoid packing the soil tightly. Trim small plants, dig small holes in the soil with a long stick and place the plants in them. Cover the top of the can with white transparent plastic sheet with holes punched in them. This would allow air movements inside the can. Your terrarium is now ready. Observe the terrarium after every few days and record the changes taking place there.

5.5 CARE AND PROTECTION OF ANIMALS AND PLANTS

In the last section, it was stated that plants and animals live in a variety of habitats. In these habitats there is a dependence of one on the other. Certain groups of animals depend on plants for their food and certain animal groups depend on other animals for their food. Plants also depend on animals for certain of their requirements. Plants synthesise their food by photosynthesis utilising carbon dioxide. Animals on the other hand take in oxygen from air and release carbon dioxide into atmosphere. Thus there is a maintenance of a balance of oxygen and carbon dioxide levels in the atmosphere. This is true of many other elements as well and in all such cases, there is the involvement of living world. The plants and animals play a significant role in the maintenance of balance of several elements on the earth. In this section we shall look into the benefits derived from plants, animals and the need to conserve and protect the different groups of animals and plants.

Activity 11

Forest is an environment which is full of trees of various types. Man depends on forests for several of his requirements. Let your students make a list of useful products obtained from forests. And then ask them if there is a need to protect forests.

What are the possible ways by which the forests could be protected?

- Avoiding cutting trees needlessly and thoughtlessly
- Protecting trees from forest fires
- Protecting the tree from plant diseases and
- Planting of more and more trees

The need to conserve plants and animals and creation of an awareness about our environment have to be inculcated in the minds of the students by discussing these topics with them as frequently as possible. Visits to nearby poultry farm where the owner takes an extreme care of his poultry can be cited as an example of protection and a visit to a garden to see that how a gardener bestows care on plants. The students must be made to realise that it is everyone's duty and responsibility to protect plants and animals. Students should also be talked to about the wild animals and how poaching and hunting cause a reduction in their numbers. You can bring to their attention the dwindling numbers of tigers, rhinos and lion tailed monkeys and golden langurs. Also you may tell them that developmental activities carried out for the welfare of the people always interfere with environment and organisms living in there. Take your students to a wild life sanctuary, a bird sanctuary and a national park and let them see for themselves the steps taken by the Government for the protection of plants and animals. The following are some of the well known wild life Sanctuaries/National parks in India and the states where they are located.

Sanctuary/National park-	State
1. Corbett National Park	Uttar Pradesh
2. Kanha National Park	Madhya Pradesh
3. Hazari Bagh National Park	Bihar
4. Bandipur National Park	Karnataka

Sanctuary/National park-	State
5. Mudumalai National Park	Tamil Nadu
6. Bharatpur Sanctuary	Rajasthan
7. Mehao Wild Life Sactuary	Arunachal Pradesh
8. Namdepha National Park	Arunachal Pradesh
9. Manas National Park	Assam
10. Kaziranga National Park	Assam

The students may prepare a list of names of wild animals found in their region and you may help them in preparing the list. Also they may be given brief descriptions of wild animals. An elephant always fascinates the students. You may share with students interesting information about the wild animals. For instance, the elephant is about 2.75 meters tall. It has a long and powerful trunk. Male elephants have a pair of large tusks. A baby elephant is about 0.9 meters tall and weights about 105 Kgs. A baby elephant consumes about one half to two-gallons of milk every day. An adult elephant spends 16 hours searching and feeding nearly 200 Kgs of fodder each day. The average life-span of elements is 60 to 70 years.

The need to protect the wild animals arises because of the constant interference of man into their environment. Not only their habitats are destroyed but also there is an indiscriminate killing of them. Habitat destruction leaves them homeless and bereft of their food. This results in starvation deaths. Many of the wild animals have their territories well defined in their habitat. Destroying of the habitat results in the losing of their territories; this in turn results into their straying into villages and cities, threatening human life and his crops. Apart from his interference into their environment for purpose of developmental activities, man also thoughtlessly kills wild life for various reasons. Ask the students to think of the possible reasons for the killing of the wild life. For instance, the elephants are massacred for their tusks since there is a high demand for ivory. Snakes are hunted for their skin. Huge trees are felled for the timber. Ask the students to give some more instances?

A lot of emphasis needs to be given in making the students realise the need for conservation. Respect for life and living in harmony with nature are the principles behind conservation and protection. Wanton and deliberate killing, and killing to satisfy human greed should be considered as equivalent to murder. A sense of respect for life, besides the life of humans, must be inculcated in the minds of students.

Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of this unit.

5. Each type of organism has acquired several adaptations to live in a particular habitat. Discuss this statement with illustrations/examples.

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6. Discuss the importance of protecting animals and plants. How will you build this attitude in your students?

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5.6 LET US SUM UP

In this unit the various processes that characterise life, and which distinguish life from non- life are discussed. Various characteristics of life are listed and elaborated. Many activities which students themselves can perform to comprehend some of the life processes are also included. Visits to places which are natural habitats of plants and animals are suggested. The word adaptation has been defined and the adaptations of some organisms to their modes of life have been described. The need to bring into the classroom living plants and animals, and encourage the students to observe and record the adaptations of the organisms to the environment which they occupy are emphasised. Visits to museums, zoos, wild life sanctuaries and botanical gardens that would help the students to comprehend the diversity of life are recommended. The importance of inculcating in the minds of students that the plants and animals deserve as much respect for their lives as is shown to the fellow human beings is stressed. Plants and animals are important components of our environment and environmental protection is not confined to our natural resources alone but to our living resources as well. There is a danger of losing some of the plants and animals forever from the face of the earth if they are indiscriminately killed or their habitats are destroyed. Students must be made to think and be aware of the ways and means of protecting animals and plants.

ANSWERS TO CHECK YOUR PROGRESS

1. Through observation over a period of time. Discuss the experiments in this regard.
2. Carbon-dioxide is released during exhalation.
3. An action that evokes response or reaction is a stimulus can be shown through various experiments in human beings, plants and animals.
4. i) Growth, ii) Respiration, iii) Stimulus response. What are the other characteristics?
5. This can be discussed with reference to examples of fish and frog - the shape of the body, the nature of the skin, the limbs, the gills, fins, etc.
6. Plants and animals help maintain the balance of several elements on the earth. Discuss further.