



4

LIVING WORLD AND DIVERSITY

Look around you. You will find many things like table, chair, toys, mobile, TV etc. when you will see walls and rooms, you will find mosquitoes, flies, lizard and cockroach. If you look outside your house, you will find birds, animals, cow, buffalo, cat, dogs etc moving and different plants in statue mode like neem, jamun, aam, amrood or grass grown on land or wheat-mustard in farm. If you look in sky, you will find birds, airplanes etc. if you make a list of things then things will be a long list.

All these objects can be classified into three categories- living, non-living and dead. You will be surprised to know that plants are loving beings. It is also an honour that this was told to the world by an Indian scientist Sh. Jagdish Chandra Bose. Indian Vedic scriptures have always considered plants as a living being and have always tried to protect it. Table- chair components like wood, bines or horns etc separates form animals are dead because they were a part of living body once and mirror, soil, water, stone,



iron, nail etc are non-living things, they never had any life let us know the difference between living and non-living. How are living things different from non-living things? How are living things similar to non-living things. Let us know about them.



OBJECTIVES

After learning this chapter, you will be able to:

- Tell the difference between living and non-living objects.
- Explain the characteristics of living things
- Describe the breathing process and food production for living organisms
- Explain the importance of living and non-living things

4.1 LIVING OBJECTS AND THEIR CHARACTERISTICS

Sometimes you can find the living and non living things by touching. But can you tell the characteristics of living and non-living things that make a difference. Let us see on what basis an object is considered live. Basically, there are 9 characteristics of living things:

1. Growth (development of body)
2. Cellular body structure
3. Dynamics

4. Nutrition
5. Breathing
6. Excretion (taking out wastes)
7. Reaction
8. Reproduction
9. A fixed life and death



Notes

Let us learn something about them.

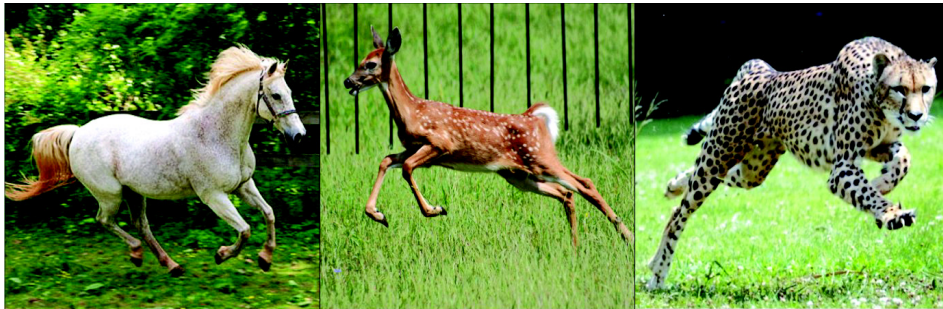


Fig. 4.1 living, non-living and dead



1. Growth in living organisms

Every living organism is small at the time of birth. It grows eventually. A small calf becomes an ox. Mango seed gives birth to a small plant which becomes a tree, you yourself were a small kid now you are getting developed and will develop till you become a man or woman. This development increases your bones, muscles and blood quantity,

Non living things don't do these activities, they do not breathe and do not make new things.

After getting full development of the body some growth maintains body parts. If you get a cut then new skin comes and fills the wound, nails also increase. This is also a growth.



Fig. 4.2 growth in living things: plant to tree

Have you ever seen any growth un cycle, glass or pencil? No, because all these things are non-living things.

2. Living things are made up of cell

Every living being or plant and their body are made up of microorganism cell. These are so small that they can only be seen with the help of microscope. Every cell has a living structure; many activities are done in this living structure. Most of the growth in living objects is due to the increase in the number of cells, new cells are formed with the help of old cells.

You must be thinking that new cells make a human being as bricks join to form the wall, but brick is a part of wall. One brick cannot make another brick. Brick is a non living thing where as cell is a living being.

Let us know important things about cell:

- Every living organism has a different cell. Some organism are made up of one cell like bacteria, amoeba etc, there are known as single cell animals.
- Many other organisms are made up of multi cell organisms like flies, humans, elephant, horse etc. These are known as multi cell organisms.
- The big the organism - the more cells- cat has more cells than mouse, cow has more cell than cats and elephants have more cell than cows.
- Banana plant has more cell than rose plants or guava trees. Banyan tree has more cells than banana plants.



Notes



3. Dynamism

Every microorganism moves. Everyone has his own pace for walking like horse, cow insects, birds etc. we can move many parts of our body. Plants also have mobility, they move while standing at one place, sunflower moves in the direction of the sun. Leaves move towards light. Roots move towards water. All these movements are from inside of the organism. These movements are not outside the body. Leaves of some trees get close in the night and open during the day. Sensitive plants get down when touched and becomes straight after some time.

Can a cycle move on its own? Watches move by cell or setting friction. They do not move by their own. No, every non living thing does not move. Power to move is given to them from outside.

4. Food is needed by living organisms

Every organism needs food. If you are kept hungry for some time, you will feel weakness. Whatever food you eat gives you growth. This growth is seen in bones, muscles or blood in your body. If an organism does not get food for a longer period of time, he will become weak and die soon. Plants make their own food. Some animals eat the plants or parts of plants. Some animals are carnivores - they eat those animals who become big after eating plants.

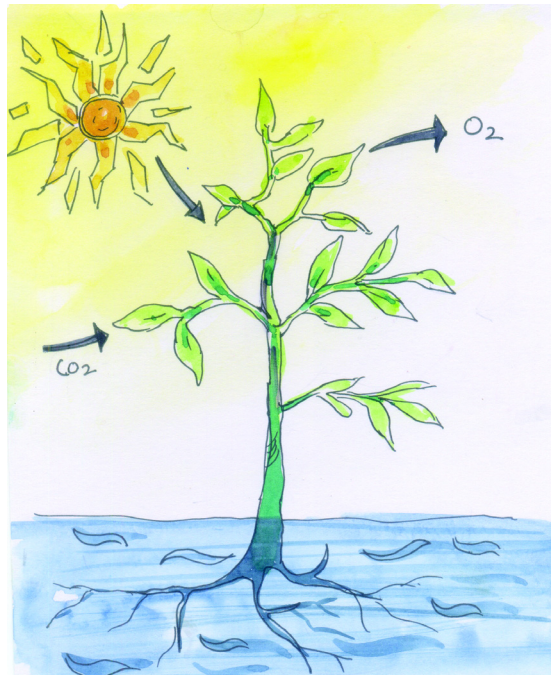


Fig. 4.4

Have you ever thought what the food of green plants is? They make their food from soil, water and carbon dioxide in presence of air and sunlight, in any one thing is missing, they die.

Does your cycle or book need food? No, they don't have growth and they don't have power to move.

5. Breathing in living things (energy generation by the use of oxygen)

We breathe (inhale or exhale) from day to night. Maximum organism inhale air and exhale it. Animals living in water like fish keeps inhaling water and exhaling it. They absorb oxygen mixed in water, this oxygen in form of air or water is used by cell as a powerful energy building. They do their own work from less energy. During this time carbon dioxide is formed in body and is exhaled by cells. Breathing activities are similar in plants



Notes



Notes

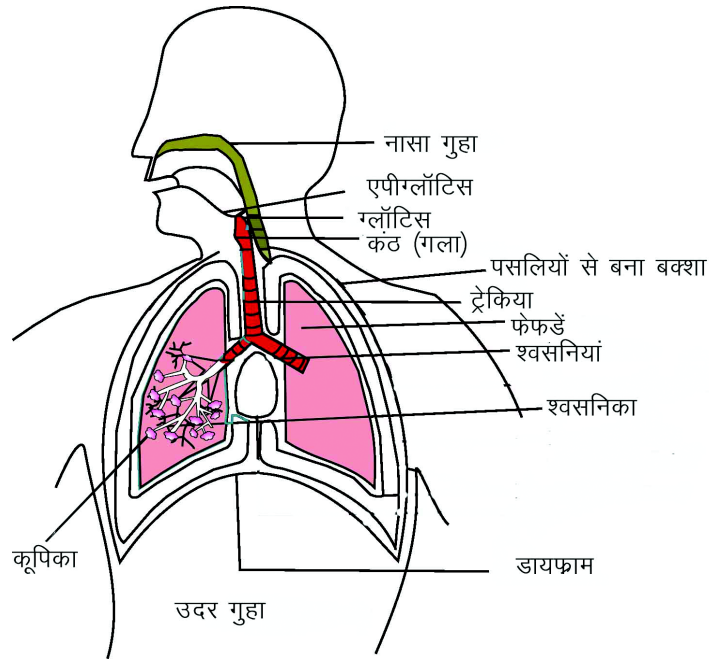


Fig. 4.4 breathing process in living things

and organisms. Plants take oxygen inside with the help of small pores in their leaves and stem. In this way, human take oxygen inside breathing practices and exhale carbon dioxide.

6. Excretion (taking out wastes by living organisms)

The body of living organisms makes water products due to the result of physical activities which are toxic. It is essential to take them out from human body. The urine of organisms also has waste products other than water. Some of the toxic elements that come out of body are sweating. Some examples of excretion are gums firm plants, falling and drying of old leaves from plants etc.

Non living things like table, chairs etc neither breather nor give out any excrete materials.



7. Reaction by living objects

Whenever your hand touches a fork or unknowingly you touch a hot utensil, then you instantly take your hand back. Any situation related to pricking or touching hot objects by which a body reacts is called stimulation and the action to that stimulate is called reaction. Many situation of same kind happens in every living organism. Plants go down in night or roots move towards water is also a reaction by plants. Stimulation always happens against temperature, light, sound, touch and chemicals.

Thinks about one thing, some time you smell tasty food and water comes in your mouth, will you call it a reaction or stimulation?

8. Reproduction or giving birth to a child

Every living organism gives birth to a new generation or child. Cow gives birth to calf. Birds lay eggs by which their children come out. Frog and fish also lay eggs, if any specie does not reproduce then that species comes to an end. Seeds grow from plants and these seeds make new plants from roots or branches. Simplest single cell organism like bacteria or amoeba also reproduces from one method or the another.

Does any non living thing make an object same to itself? No, a brick cannot make a second brick. If you break a brick from between then there will be two small bricks but they cannot increase to get normal size. It is the same way that a cycle cannot



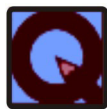
make another cycle and a chair cannot give birth to another chair etc.

9. There is no fix life of the living organisms.

Every living thing is born and it grows in size and gets old in completing the activities of life, it dies afterwards. Different organisms have different life expectancy, some have less life and some have big life. Here we present some of the examples of life tenure:

Bacteria	-	around 20 minutes
Mouse	-	around 2-3 years
Dog	-	around 12-14 years
Human	-	around 70-80 years
Bunyan tree	-	around 200 years
Tortoise	-	around 400 years
Sequoia tree	-	around 3000-4000 years

There is no life expectancy of non-living things, for example, a glass can live forever or can break any minute.



INTEXT QUESTIONS 4.1

Read the following statement and state whether they are true or false:

1. Organisms increase their size throughout their life.



2. Every living organism is made up of multi cells.
3. The process by which living organism gets food is called nutrition.
4. Green plants make their own food.
5. Sunflower keeps changing the direction according to the direction of sun.
6. Water and energy is produced during breathing.
7. Every living object reacts towards stimulants.
8. Every living object has a fixed life and they die afterwards.

4.2 DIVERSITY OF LIVEING ORGANISMS

There are thousand and lakhs of living organism on earth. They are from big to small and micro small un size. Their colour and formation is different too, some give children and some lay eggs. Some organism like amoeba or bacteria reproduces by diving into two parts, some fly in the air and some jump from one tree to another tree. Some crawl deep in ocean. Some animals crawl in desert and some other organisms move inside other organisms body. We see the diversity in animals.

Do you know that the famous bird lover of our country Salim Ali has worked on birds especially weaver birds and has written many books.



4.3 CLASSIFICATIONS OF LIVING ORGANISMS

Living organisms are very much found in population. They have different colours and form. It has been categorized into many categories on the basis of similarities.

Basically living organisms are categorized into two categories - plants and organisms. Let us know more about them.

1. Plants are fixed in land and have the leaves of green or another colours.
2. Organisms can move from one place to another and eat other organisms or plants.

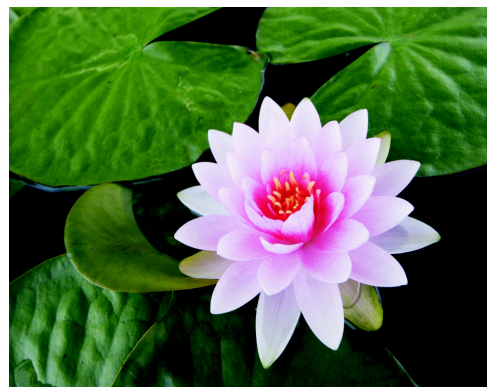
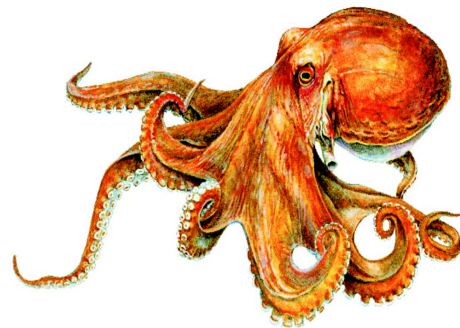
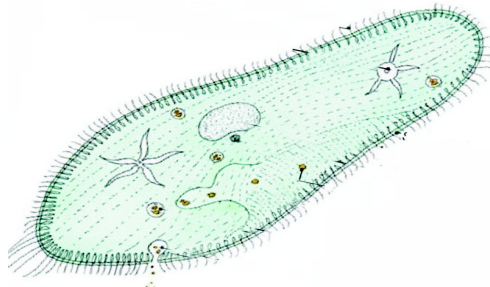


Fig. 4.6 diversity in living beings - one eye



3. The third category belongs to those who are not green colour plants and not moving organism, one of the example is white coloured fungi which loves on food items or mushroom grown for food or dirty place grown mushroom.
4. The fourth category is of micro organism which have one cell body like algae (green coloured thread like structure in a pond) or amoeba living in dirty water.
5. Fifth category has a single cell bacteria or micro organism. Lakhs of bacteria can live in a needle's tip.

Organism are being classified from old times, this classification was started by Carl Linius in 1735 in modern science. But now days these are classified into five types with some changes. They have been placed from simple to complex in the following manner -

1. Monera kingdom - bacteria, virus etc.
2. Protista Kingdom - Algae, Amoeba, etc.
3. Fungi - Fungi kingdom - fungus, mushroom etc.
4. Plantae Kingdom - plant kingdom - all plants like neem, mango, rose, marigold etc.
5. Animalia kingdom - organism kingdom 0 all organism like dog, monkey, cat, lice, bird, humans etc.



Notes



INTEXT QUESTIONS 4.2

Fill in the blanks with correct option:

1. From an outside world we see many _____ in a big world. (Similarity/diversity)
2. All living objects are classified into _____ kingdom. (four/ five)
3. _____ comes in Monera kingdom. (Bacteria/fungi)
4. Amoeba and algae etc come under _____ kingdom. (algae/ protista)
5. Fungi that comes on bread comes from _____ kingdom. (fungi/ plantae)



WHAT HAVE YOU LEARNT

- All living organism are made up of cells.
- Every living organism needs food. It grows and moves, breathes, excretes, reacts to stimulants, reproduces and dies after completing a fixed age of life.
- It gives birth to new organisms like him.
- Some organisms are made up of multi cells and are called multi cell organism.
- Plants make their own food. Organisms get their food directly from plants by eating them (herbivores) or by eating other animals. (carnivores).



- Living organism do breathing, they intake oxygen and release carbon dioxide. Energy is used to do various activities of body.
- There is a big diversity in living world.
- The diversity of organism is according to their color, formation, shape, size, life style, living habits and reproduction methods etc.
- All living organism are divided into five categories from single to complex - single cell monera, actual/real cell protista, fungi categories (fungus), plantae (plantae kingdom) and organism world (animalia).



TERMINAL QUESTIONS

A. Tick the correct option:

1. cells are found in:
 - (a) Brick walls
 - (b) Only plants
 - (c) Only animals
 - (d) Both b and c
2. Given below are few groups of organisms. Identify the group which doesn't have a plant and animal?
 - (a) Rose, eagle, lice
 - (b) Fish, mushroom, earthworm



Notes

- (c) Peepal, butterfly, fungi
- (d) Bacteria, amoeba, algae
3. what do you call the making of new cells for the growth of body and maintaining cells giving food?
- (a) Breathing
- (b) Nutrition
- (c) Excretion
- (d) Reproduction
4. Which of the following is required by plants to make their food?
- (a) Only water
- (b) Only light
- (c) Only carbon dioxide
- (d) Water, light and carbon dioxide
- B. Fill in the blanks with appropriate word:
1. All living organisms are made up of _____.
 2. _____ gas is produced during breathing.
 3. _____ is a single cell organism.
 4. Living organisms are divided into _____ categories.
 5. All organisms are kept in ___ world called animalis.

C. Answer the following questions briefly:

1. Write 5 characteristics of living things?
2. List the difference between living and non living things?
3. Why do living objects need food?
4. What is meant by nutrition?
5. All organisms inhale oxygen. What is the use of this oxygen in body?
6. Name any 4 organisms that lay eggs?
7. What is meant by category of living things? Write their names.



Notes



ANSWERS TO INTEXT QUESTIONS

4.1

1. True
2. False
3. True
4. True
5. True
6. False
7. True
8. True

CLASS-IV



Notes

4.2

1. Diversity
2. Five
3. Bacteria
4. Protista
5. Fungi

