LIVING ORGANISMS & THEIR SURROUNDINGS

INTRODUCTION

The living organisms as well as the nonliving things are made of matter. Anything that is made of matter has mass and occupies space. Thus, everything around us, whether living or nonliving, has mass and occupies space. The smallest particles of matter are molecules. These particles constitute living beings and nonliving things. But that is where the similarity between the living and nonliving ends. The structural unit of water is a molecule of water. A cup of water is simply billions of molecules of water. This is not true for living organism. Though a living being is also made of molecules, just those molecules put together do not make an organism. The most basic unit, or structural unit, of an organism is the cell. Every living organism starts from a cell, which divides and redivides to give rise to the organism.

HABITAT AND ADAPTATION

(a) Habitat :

The term habitat refers to the surroundings where organisms live. Every habitat is home for a certain living creature. Plants and animals have different features that help them to survive in their own habitat.

The components in a habitat are broadly classified into two types. they are **biotic** and **abiotic**.

Biotic components include all the livings organisms in a habitat. **Abiotic components** include all the non-living things in a habitat. These include air, rocks, water, sunlight and heat. All livings things depend on the abiotic components for all their needs. The abiotic components are very useful for the survival of the biotic components in a habitat. For example, sprouting is the first step where a new plant grows from a seed. The sprouting such as air, water, light and heat.

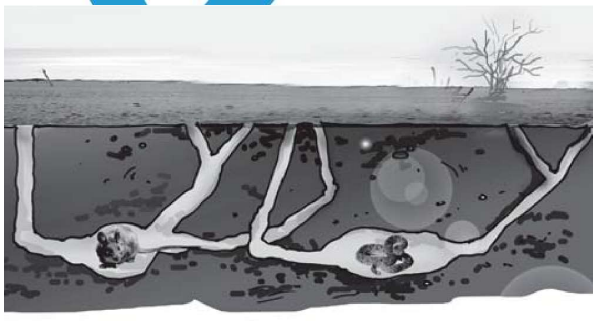
• The population of some species of turtles has declined due to the change in the earth's temperature.

• Some popular theories believe that dinosaurs became extinct because of the changes in the earth's temperature millions of years ago.

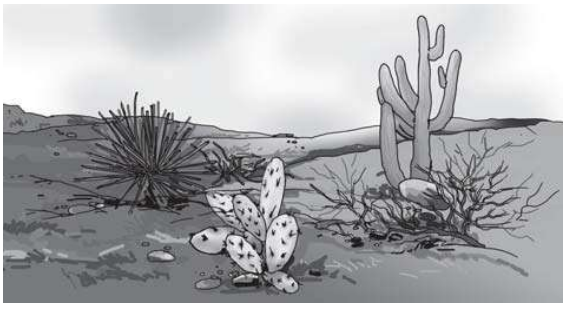
• Habitat can be terrestrial or aquatic :

The surroundings where organisms live is called a **habitat.** The organisms depend for their food, water, air, shelter and other needs on their habitat. Habitat means a dwelling place (a home). Several kinds of plants and animals may share the same habitat.

The plants and animals that live on land are said to live in **terrestrial habitats.** Some examples of terrestrial habitats are forests, grasslands, deserts, coastal and mountain regions. On the other hand, the habitats of plants and animals that live in water are called **aquatic habitats.**



Desert animals in burrows



Some typical plants that grow in desert

(b) Adaptation :

Plants and animals develop certain features or certain habits that help them survive in their surroundings, and this is known as adaption. Different living creatures adapt to their habitats in different ways. For example fish have gills that help them to live in water and use the oxygen dissolve in it. Plants that live in water have special tissues that help to take in dissoved gas from water. For example the ulva has **ribbon-like leaves.** It takes thousands of years for a livings being to adapt to its habitat.

Adaptation in different habitats :

[A] Terrestrial Habitats :

(i) Deserts : Desert is a water deplete area so basically plants and animals are adapted for little less of water.

- Desert animals include camel, rats and snakes.
- To stay away from the intense heat during the day, rats and snakes stay in burrows deep in the sand. They come out only during the night, when it is cooler.
- **Camel's nostrils have long hairs to prevent the entry of sand and dust. They have no sweat glands in their skin.**
- Desert plants lose very less little water through transpiration.
- Desert plants-either have no leaves or they have small or spine shaped leaves to reduce transpiration.
- Photosynthesis is usually carried out by stems.
- The stem is covered with a thick waxy layer which helps it to retain water.
- They have deep roots for absorbing water.

(ii) Mountain regions : They are normally very cold and windy. In some places, snowfall may take place during winter.

- The leaves of some trees are needle-like so that snow and rain water can slides off easily.
- Animals have thick skin or fur to protect them from cold.
- Yaks have long hair to keep them warm.

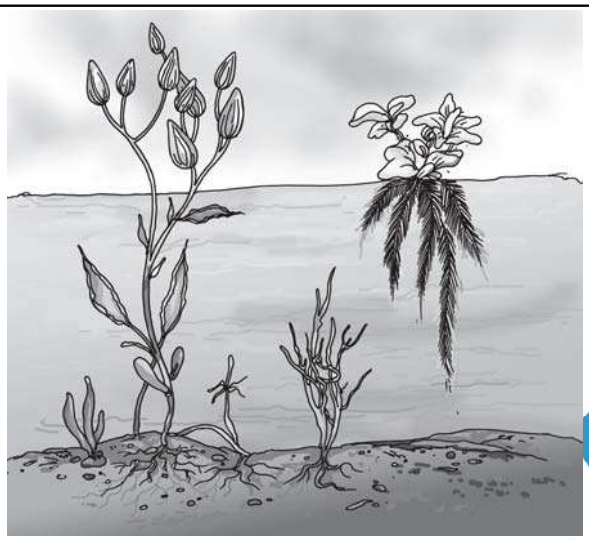
(iii) Grasslands

- Lion lives in grassland.
- Its light brown colour helps it to hide in dry grasslands when it hunts for prey.
- A deer has strong teeth for chewing hard plant stems.
- It has long ears to hear the movement of the predators.
- The eyes on the side of its head allow it look in all directions for danger.
- The speed of the deer helps them to run away from the predators.

[B] Aquatic Habitats :

(i) Oceans :

- Sea animals like squid and octopus stay near the seabed and catch any prey that move towards them. When they move in water, they make their body shapes streamlined.
- Generally aquatic animals have gills to help them use the oxygen dissolved in water.
- Dolphins and whales do not have gills. They breathe in air through nostrils or blowholes that are located on the upper parts of their heads. This allows them to breathe in air when they swim near the surface of water.
- They can stay inside the water for a long time without breathing.



Some aquatic plants float on water. Some have their roots fixed in the soil at the bottom. Some aquatic plants are compltely submerged in water.

(ii) Ponds and Lakes

- Roots of plants are much reduced in size and their main function is to hold the plant in place.
- The stem is long, hollow and light.
- The stems grow upto the surface of water while the leaves and flowers float on the surface of water.
- Some plants are totally submerged in water, ie, all parts of the plant grow under water. These plants have narrow and thin ribbon like leaves.

  Through highly divided leaves, the water can easily flow without damaging them.
- They can bend in the flowing water.
- Frogs have ponds as their habitat.
- It can stay both inside the pond water as well as on land.
- They have strong back legs that help them in leaping and catching their prey.
- They have webbed feet which help them swim in water.

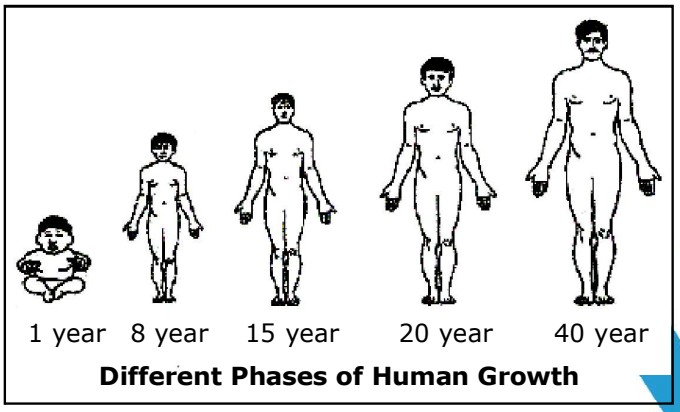
CHARACTERSTICS OF LIVING THINGS

1.	**Movement**	**2.**	**Growth**	**3.**	**Food**
4.	**Respiration**	**5.**	**Excretion**	**6.**	**Responsiveness**
7.	**Reproduction**	**8.**	**Life cycle**		

1. Movement : Both plants and animals show movement.

Movement of animals is very easy to make out — they walk, run, swim or fly. Such movement are called locomotion. During locomotion, the entire body of an animal moves fro one place to another. They do so mainly to gather food and to avoid enemies. Just as cows move about in search of grass. When disturbed, a frog jumps into the water, and so on. Plants do not move from one place to another. But they show movement of their parts. It you touch a leaf of the sensitive plant (Lajwanti), it droops. After a few minutes, the wilted leaf recovers and stands erect. Sunflower always turns towards the sun. There are many plant which fold their leaves or close the petals of their flowers at night and reopen next morning.

2. **Growth (From tiny to big) :** When you were born, you were a small baby. Through the years, you have grown. Now you are a grown-up boy or girl, and in years to come, you will be an adult human. Your bones become longer, muscles become larger and the amount of blood in your body increases.



Different Phases of Human Growth

A tiny chick hatches from the egg. It gradually grows in size to become a mature hen. All animals grow only upto a certain age. Full grown plants do not grow taller every year, they only produce new branches and leaves, and their trunks grow thicker. Growth in plants is faster and easier to observe

3. **Food :** All living beings need food to acquire energy. This energy is utilized by them to carry out their activities. Green plants are called autotrophs as they make their own food. They take in simple things like carbon dioxide and water and prepare their food the form of starch. Energy needed int his process, comes from sunlight. Animals and non-green plans are called heterotrophs as they take thier food directly or indirectly from plants.

All Animals need food

4. **Respiration (Release of energy) :** Whey you are doing some exercise or running fast, the muscles of your body need more energy. This energy is provided by the "burning" of food. The process of release of energy by the burning of food in your body is called respiration. We obtain oxygen for "burning" the food through the air we breathe in. All living beings, plants and animals, breathe. Animals breathe through the nose and plants by minute pores on their leaves and stem.

5. **Excretion (Removal of poisonous wastes) :** Body activites of all organisms produce certain nitrogenous waste substances. These are usually poisonous and must be thrown out the body. This is called excretion. The excretion in animals is usually in the form of urine. Plants throw out their waste products in the form of gums and resins, etc. with the help of special cell or from the entire plants surface.

6. **Responsiveness (Sensitivity) :** Stimulus is a happening in the surroundings which affects the individual. The reaction which an individual shows to the stimulus is called **responsiveness.** Light, sound, heat, smell touch pressure, etc. are example of various stimuli. All living beings, plant or animal react to stimuli.

7. **Reproduction (Produce off springs) :** If an organism simply lived and ultimately died, its race would come to an end. To continue their race, all living beings tend to produce their young ones.

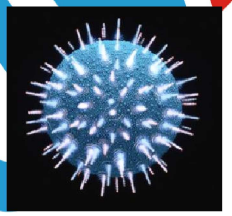
   Seeds, produced by plants, germinate and give rise to new plants. You also know that a cow gives birth to a calf and a bird lays eggs which produce chicks. Thus, all the plants and animals reproduce and give birth to their own kind.

8. **Life Cycle :** Living things follow a life cycle. They start their life form a single cell. In case of animals, the life cycle consists of birth, growth, reproduction and death. In plants, life cycle of an organism may take a few hours, a few days or hundreds of years to complete. The period during which an organism completes its life cycle is called its life span. In case of bacteria, for example, the life span is very short.

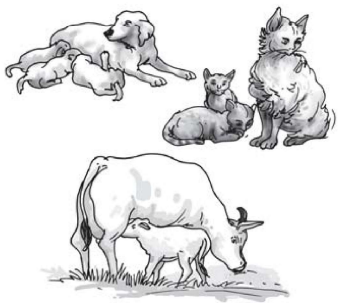
S.No.	ORGANISM	LIFE SPAN
1	Bacteria	20 minutes
2	Pea	4 moths
3	Pine	Several years
4	Housefly	1-4 months
5	Mouse	2-3 years
6	Dog	16-18 years
7	Lion	20-25 years
8	Elephant	70-90 years
9	Humans	60-80 years
10	Tortoise	120-150 years

- **Are there things in between living and non living :**

Yes, viruses are such entities existing in the universe. Viruses grow and multiply only when they are inside living things like man. Outside living bodies, they are lifeless and are just like a crystal.



A Virus



Some animals which give birth to their young ones