

ENVIRONMENTAL STUDIES

UNIT - 1

LIVING ORGANISMS

After studying this unit you :

- differentiate between living beings and non-living things.
- identify the important characteristics of living beings.
 - growth
 - nutrition
 - movement
 - respiration
 - excretion
 - response to stimulus
 - reproduction
 - life span
 - cellular structure

In our daily life, we come across plants, animals, stone, soil etc., Can you think of some such examples? They may be broadly classified into two categories namely **living beings** and **non-living things**. Living beings include plants and animals. Non-living things include stone, soil etc. Why do we group plants and animals under living beings, stone and soil under

non-living things ? Life can be defined only in terms of certain characteristics such as growth, nutrition, movement, respiration and response to stimulus etc. Non-living things do not have these characteristics.

Let us study about these characteristics.

1) Growth :

Can you wear the clothes of your younger age ? How do you feel ? Will it be comfortable ?

This is because of your growth. **Growth** means, an increase in size of living beings. Have you observed some of the following happenings in your surroundings?

- i) Baby growing into a small child
- ii) Kitten growing into a cat
- iii) Plant growing into a tree

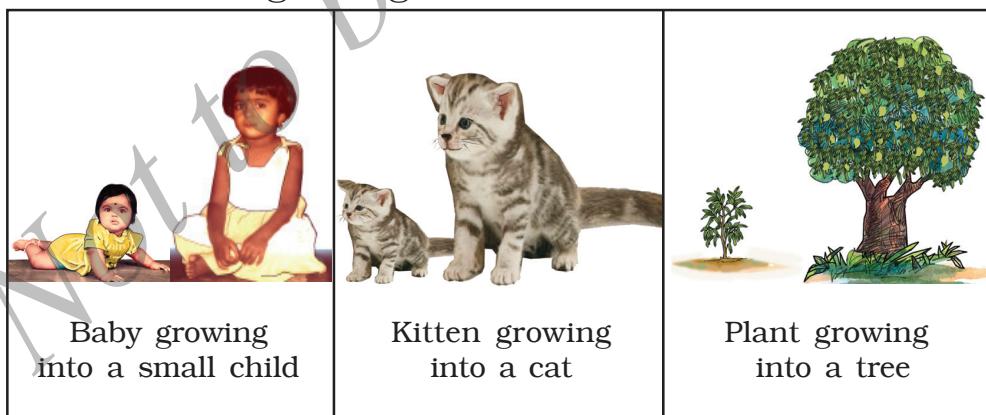


Fig. 1.1

All these pictures show the growth of the living beings. The growth is internal.

Know this :

Sometimes non-living things increase in size. Example : a heap of waste increases in size. The growth is external.

Try this : Take a pot filled with soil. Sow some bean seeds in it. Sprinkle water daily and keep that pot in the sunlight for 4 to 5 days and observe. What change do you observe ? What is the reason for that change ?

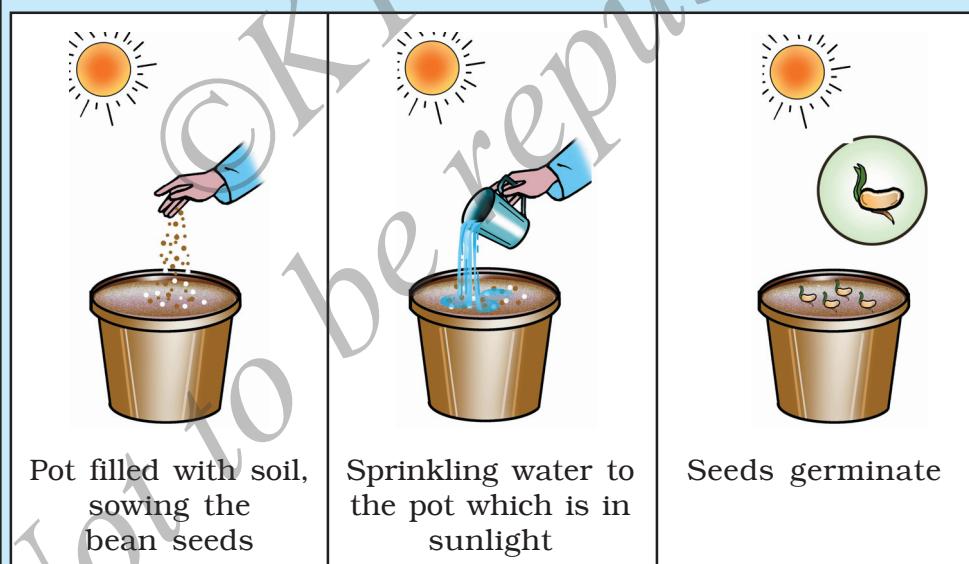


Fig. 1.2

Non-living things do not grow.

2) Nutrition :

Living beings need food for their growth, survival and to produce energy required for various activities. The process by which a living being assimilates food and uses it for growth is called **nutrition**.

Word help :

Assimilate - be absorbed into system.

Non - living things do not need food.

Activity : 1.1 : List out some of the food items that you eat daily.

1.	6.
2.	7.
3.	8.
4.	9.
5.	10.

3) Movement :

You have seen birds flying in the sky. We walk, a fish swims and a frog leaps.

All these actions like flying, walking, swimming and leaping are called **movements**. Micro - organisms like amoeba and paramecium also show movement.



Fig. 1.3
Movements of living beings

Non-living things do not move on their own.

Activity 1.2 : Write the names of different animals showing different kinds of movements.
Example : snail crawls.

Activity 1.3 : Observe the movements of paramecium under the microscope with the help of your teacher.

4) Respiration

Activity 1.4 : Try this experiment.

Take about 2 ml of lime water in a test tube and observe its colour. Gently blow air into the test tube through a straw.

What do you observe ?

Do you find any change in the colour of the limewater in the test tube ?

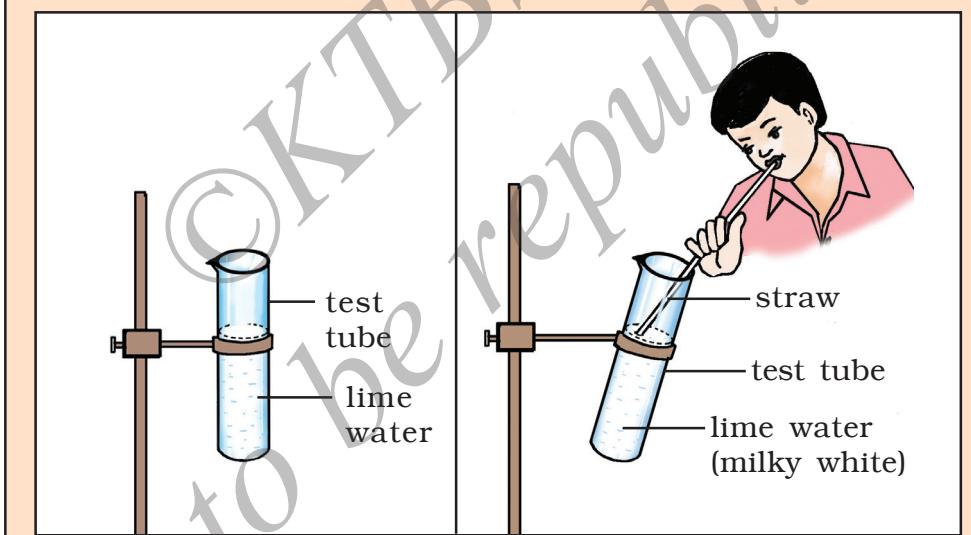


Fig. 1:4

Know this :

When carbon dioxide is passed through limewater, the colourless lime water turns milky white.

Try This : Take some sprouted beans in a wide mouthed glass bottle. Take some lime water in a small beaker (50 ml capacity) and place it in the bottle as shown in the figure. Close the lid of the bottle tightly. After one day observe the lime water kept in the beaker inside the bottle. What will you notice ?



Fig. 1.5

After conducting this experiment, what is your conclusion ?

Living beings respire. During respiration, the living beings take in air, uses **oxygen** and give out **carbon dioxide**. The oxygen taken in is used to release energy from food. You know that energy is used by the organisms to perform various life activities.

This experiment shows that the air that we breath out contains carbon dioxide.

Non-living things do not respire.

Activity 1.5 : Observe the respiratory movements of dog, fish, frog and man.

5) Excretion :

Living beings produce waste materials in their body while carrying out life activities. The discharge of waste products like urine and sweat from the body of a living being is called **excretion**.

If these waste products are not eliminated, they become toxic and may harm the living beings.

Word help :

Eliminate - remove.
Toxic - poisonous.

Non-living things do not excrete.

6) Response to stimulus :

If you touch an insect like butter fly, What will it do ? It may fly away from that place. Thus it reacts to the changes in its surroundings. The change in the surroundings is



Fig. 1.6

called the **stimulus** and the reaction of the butterfly to fly away is called the **response**.



Hello, I am touch-me-not plant. Don't touch me. If you touch me, I will fold my leaves.

Fig. 1.7



I am sunflower.
I tend to turn in the direction of the sun.
Hence my name is sunflower.

Fig. 1.8



I am millipede.
If you touch me,
I roll into a coil.

Fig. 1.9

These are some common activities taking place in our surroundings. Recall some of these instances.

1. When light falls directly on your eyes, you close your eyes.
2. When you show a piece of bread to a dog, it secretes saliva.
3. When you hear a loud sound of a bursted cracker, you close your ears.
4. When you touch a hot object, suddenly you take away your hand.

Word help :

Saliva - watery substance produced in the mouth.



Fig. 1.10

Activity 1.6 : From the instances mentioned in the figure 1.10, list out the stimuli and the corresponding responses separately in the columns given.

<i>Stimulus</i>	<i>Response</i>
1.	
2.	
3.	
4.	

Non-living things do not show any response to stimulus.

7) **Reproduction :**

Living beings continue their progeny by producing young ones of their own kind. This process is called **reproduction**.

Word help :

Progeny - offspring.

For Example,

- i) A woman gives birth to a baby.
- ii) A cow gives birth to a calf.
- iii) A hen lays eggs, which develop into chicken.
- iv) A plant reproduces through seeds.

Non-living things can not reproduce.

8) Life span :

Living beings have a definite life span. **Life span** is the period between the birth and death of a living being. The life span of living beings vary from a short period to a long period.

Depending upon the life span of plants, they are grouped as annuals, biennials and perennials.

- i) **Annuals** : These are plants which live for one year or one season, produce flowers, fruits, seeds and die.

Example : wheat, paddy, mustard, cucumber, tomato.

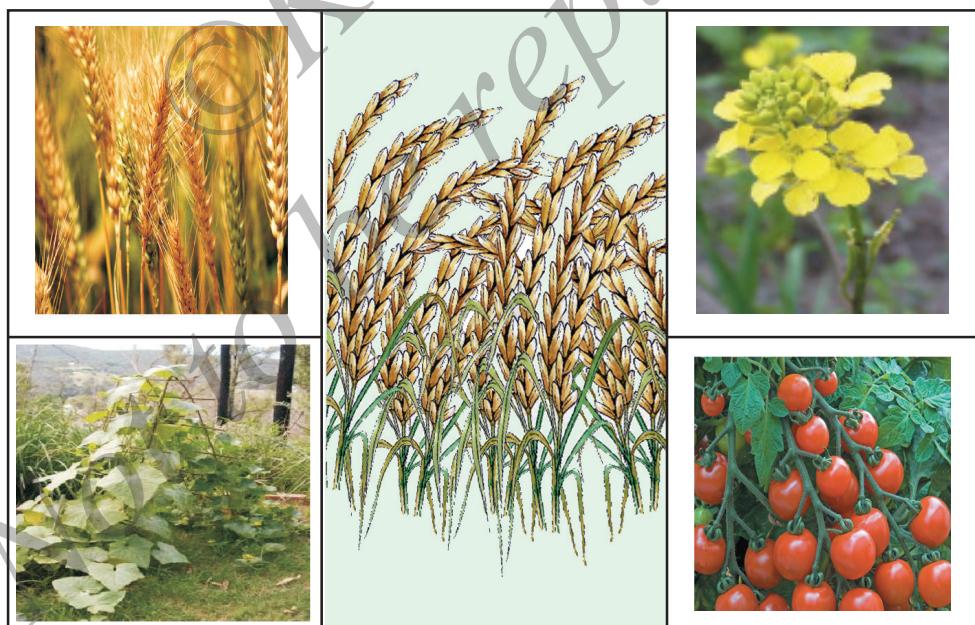


Fig. 1.11
Annuals.

- ii) **Biennials** : These are plants that live for two years or two seasons, produce flowers, fruits, seeds and die.

Example : carrot, sugarcane, cabbage, beetroot.



Fig. 1.12 Biennials

- iii) **Perennials** : Some plants live for many years and produce flowers, fruits and seeds throughout their life. They are perennials.

Example : mango, lemon, jackfruit, coconut tree.



Fig. 1.13
Perennials

Non-living things do not have life span.

Activity 1.7 : Collect pictures and names of several plants. Group them as annuals, biennials and perennials.

Know this :		
Life span of some living beings		
Sl. No.	Name of the living beings	Life span (in years)
1.	rat	5 - 7
2.	dog	20 - 25
3.	vulture	60 - 70
4.	man	70 - 100
5.	tortoise	150 - 200
6.	bamboo	about 20
7.	mango tree	90 - 120
8.	coconut tree	over 100
9.	neem tree	150 - 200
10.	banyan tree	about 400

9) Cellular Structure :

Living beings are made up of cells. **Cells** are very small units which can be seen only with the help of a microscope.

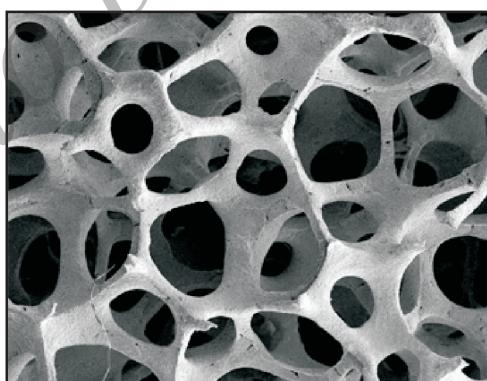


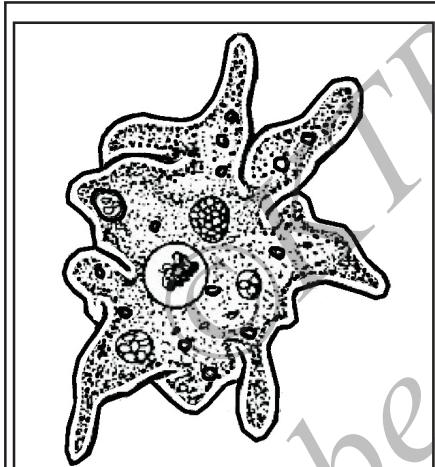
Fig. 1.14
Cellular Structure of Living beings

Some of the living beings like amoeba, paramecium, euglena are made up of only one cell. These are called **unicellular organisms**. Some living beings like dog, man, rose plant are made up of many cells. These are called **multicellular organisms**.

Word help :

Unicellular - consisting of a single cell.

Multicellular - consisting of many cells.



Unicellular organism



Multicellular organism

Fig. 1.15

Activity 1.8 : Take a thin peel of onion and observe the cellular structure under a microscope with the help of your teacher.

Non-living things do not have cellular structure.

Know this :

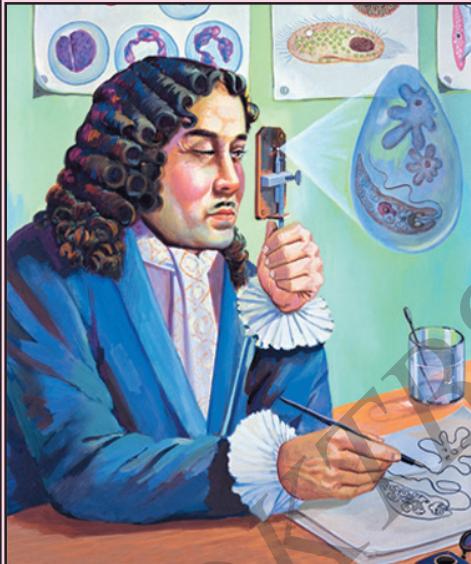


Fig. 1.16
Leeuwenhoek (1632-1723)

Leeuwenhoek, a lens grinder from Holland was the first one to develop microscope. He observed a drop of pond water under his microscope and found a number of micro-organisms.



Fig. 1.17
Robert Hooke (1635-1702)

Robert Hooke, a scientist from England was the first one to discover the cell. He observed a slice of cork under the compound microscope developed by him. He discovered small honey comb like structures in it. He called them as **Cells**.

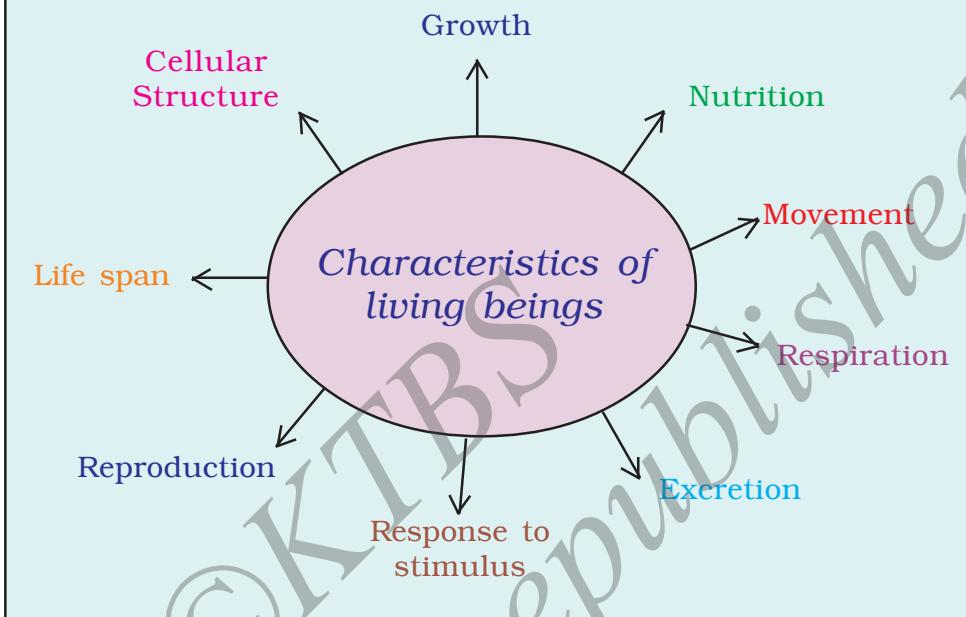
Activity 1.9 : Look at these pictures. List them as living beings and non-living things in the columns.



Fig. 1.18

<i>Living beings</i>	<i>Non-Living things</i>

Characteristics of living beings :



Remember :

- Living beings show certain characteristics which make them distinct from non-living things.
- Living beings have the characteristics like growth, nutrition, movement, respiration, excretion, response to stimulus, reproduction, life span and cellular structure. Non-living things do not have these characteristics.
- An increase in size of living beings is called growth.
- Nutrition is a process by which a living being assimilates food and uses it for growth.

- Micro-organisms like amoeba and paramecium also show movement.
- During respiration, the living beings take in oxygen and give out carbon dioxide.
- The discharge of waste products like urine and sweat from the body of a living being is called excretion.
- Life span is the period between the birth and death of a living being.
- Based on their life span, plants can be grouped as annuals, biennials and perennials.
- Living beings are made up of cells.

Tips :

- Have pets at home, observe their life style.
- Practise deep breathing which increases life span and improves health.

Exercises :

I. Choose the most appropriate answer and put a tick (✓) mark against it :

1. The discharge of waste products from the body, produced due to life activities is called
 - a. respiration
 - b. excretion
 - c. nutrition
 - d. reproduction

2. Sugarcane is an example for
- a. biennial
 - b. triannual
 - c. perennial
 - d. annual

II. Fill in the blanks with suitable words :

1. All living organisms are made up of _____
2. Living beings made up of only one cell are called _____
3. The period between the birth and death of a living being is called _____
4. An increase in size of living beings is called _____
5. The process of using oxygen from the air and giving out carbon dioxide is called _____

III. Answer the following questions :

1. What are the characteristics of living beings ?
2. What is reproduction ?
3. What is nutrition ?
4. How are plants classified according to their life span ?
5. Living beings need food. Why ?

**IV. Identify the characteristics of living beings in the following table by encircling them.
For example : LIFE SPAN**

R	E	S	P	O	N	S	E	T	O	S	T	I	M	U	L	I	
E	X	C	R	E	T	I	O	N	A	B	C	D	E	F	I	J	
X	P	Y	Q	O	Z	R	R	V	C	T	E	O	W	X	F	L	
P	S	T	K	G	L	I	M	O	V	E	M	E	N	T	E	M	
P	T	S	U	R	K	A	N	Y	A	R	A	P	Q	R	S	K	
R	E	P	R	O	D	U	C	T	I	O	N	C	D	E	P	O	
S	R	Q	P	W	W	O	N	M	L	K	J	I	H	G	F	A	R
T	U	V	W	T	Y	Z	N	U	T	R	I	T	I	O	N	R	
H	L	Q	U	H	M	I	V	N	J	W	O	K	X	P	G	Q	
C	E	L	L	U	L	A	R	S	T	R	U	C	T	U	R	E	
A	B	R	E	S	P	I	R	A	T	I	O	N	T	S	B	G	

Project work :

Try This :

In the case of touch-me-not plant,

- (a) give a feather touch
- (b) give a rough touch
- (c) put a drop of water
- (d) concentrate sun's rays using a lens
- (e) cut the leaf into half

Count the pairs of leaves that close and time taken to reopen in each case.