Chapter 6

Living and Non-living

Points to study

6.1 Living and non-living – introduction
6.2 Difference between living and non-living
6.3 Characteristics of living beings

6.1 Living and non-living - Introduction :

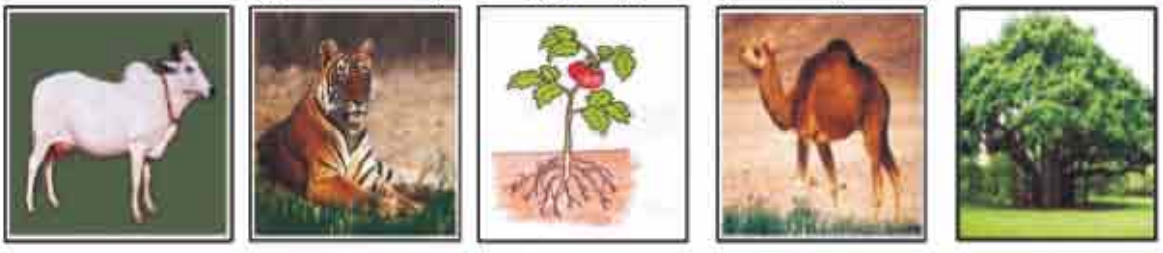
Think about your nearby surroundings and name the objects and the animals found in the environment. Make a list of these objects and animals and classify them according to the following table-

Table 6.1 Classification of objects and animals according to their activities:

S.No.	Name of the object and animal	Moves by itself	Eats food	Breathes	Grows with time
1	Bag	No	No	No	No
2	Cow				
3	Goat				
4	Stone				
5	Chair				

On the basis of above table, we can say that some animals like humans, cow, goat, parrot, fish etc move by themselves, they breathe and grow. Growth is clearly visible in plants also but these activities are not present in other objects.

So, those organisms in which processes like respiration, movement, growth, reproduction, nutrition etc occur are living. For example- cow, goat, camel, tiger, banyan tree, plants etc. The things in which above mentioned processes are absent are non-living. For example- bag, pen, pencil, rubber, table, chair etc.



Cow Tiger Plant Camel Banyan

Figure 6.1 - Living beings

Animals and plants show characteristics like growth, movement, respiration, nutrition, reproduction, excretion etc and thus they are called living beings.

In this way, all the objects and plants found in our surroundings are divided into two groups.

(i) Living- All plants, animals and microorganisms

(ii) Non-living- All objects except plants, animals and microorganisms.

6.2 Differences between living and non-living

Complete the following table to differentiate between living and non-living:

Table 6.2

S. no	Characteristic	Living	Non-living
1.	Life span	Fixed life span	Not fixed
2.	Food		
3.	Respiration		
4.	Reproduction		
5.	Growth		
6.	Excretion		

6.3 Characteristics of living beings

By interpreting the above table 6.2, we can say that living beings have some specific characteristics. These characteristics are as follows:

(i) Living beings eat food.

(ii) Living beings grow.

(iii) Living beings respire.

(iv) Living beings can move by themselves.

(v) Living beings have sensation and they respond towards stimulus.

(vi) Living beings perform excretion.

(vii) Living beings reproduce.

(viii) Living beings have a fixed life span.

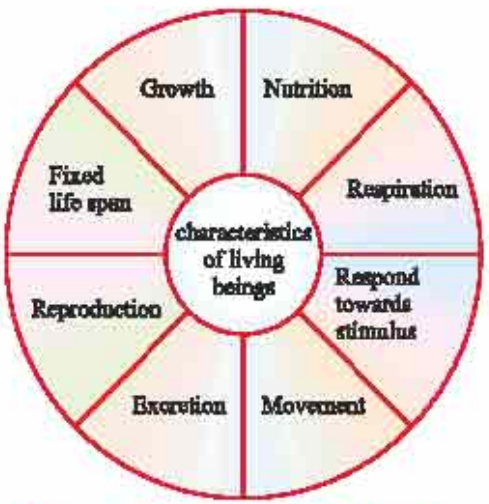


Figure 6.2 Characteristics of living beings

(i) Living beings eat food

How do plants take food?

What do animals eat?

You know that plants prepare their own food by photosynthesis and animals depend mainly on plants for their food. Food provides energy to living beings so that they can perform various daily activities.

(ii) Living beings grow

On the basis of our daily observations, we can say that living animals and plants grow. It is the basic characteristic of all the living beings. In animals, growth stops after a certain time but in perennial plants, growth continues.

Figure 6.3 (a) Growth in plants

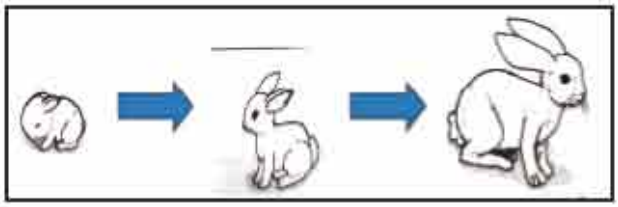


Figure 6.3 (b) Growth in animals

(iii) Living beings respire

Do all living beings breathe?

Which gas is taken in by living beings during respiration and which gas is given out?

Living beings take in oxygen and give out carbon dioxide gas during respiration.

The breakdown of glucose by oxygen and release of energy in our body is called respiration. Carbon dioxide gas is released in this process.

Does respiration occur in plants also? Yes, respiration occurs in plants also.

Respiration is essential for all living beings (animals and plants). Living beings cannot survive without respiration.

(iv) Living beings can move on their own

You have seen human beings and animals walking, fishes swimming in the water, birds flying and snakes crawling.

Do plants also move from one place to another?

Do plants also show movement?

Which characteristics of movement are found in plants?

Let us find out. Animals can move from one place to another but in plants, only indications of movement are observed. The bending of sunflower plant towards the sunlight is an example of movement in plants.

Some non-living things like bus, cycle, car etc can also move. They show movement but they do not move on their own. Here, movement is caused by external factors. They lack other characteristics of living beings.

(v) Living beings are sensitive and respond towards stimuli

- Why do you pull back your leg when pricked by a thorn or a needle?
- Why does your mouth start watering when you see delicious food?

By discussing the above mentioned questions, we can conclude that living beings react towards changes in our environment, in one way or the other, and it is called the response towards stimuli.

- Do plants also respond towards stimuli?
- Plants also respond towards stimulus. For example- leaves of mimosa plant (touch-me-not) shrivel when touched.

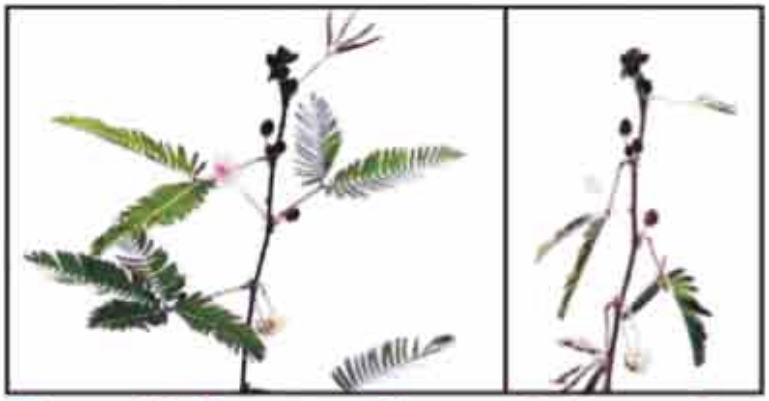


Figure 6.4 : Response of leaves of mimosa plant

(vi) Excretion occurs in living beings

You know that all animals eat food. Digestion of food occurs in the body of animals. Not whole of the ingested food is used by the body. The undigested part of food is expelled out of the body as waste (faeces- urine). Body sweat is also a form of waste material.

- Do plants also release waste material?

Some harmful materials are also present as waste in plants. They are removed in the form of secretions. In some plants, these waste materials are collected in some special parts, like- gum.

The process of removal of waste material out of the body by living beings is called excretion.

(vii) Reproduction occurs in living beings

Animals produce offsprings similar to them by the process called **Reproduction.** Some animals reproduce by laying eggs. Make a list of animals found around you that can reproduce by laying eggs.

Similarly, you might have seen new plants getting produced by the germination of seeds. On this basis, we can say that all living beings produce offsprings of their own kind and this process is called **Reproduction.**

- Reproduction is an important characteristic of living beings.
- Reproduction ensures the existence of living species.
- Living beings produce offspring similar to them.

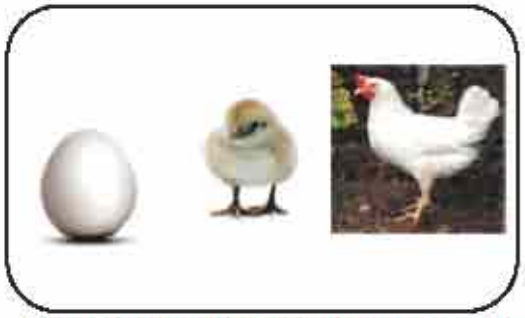


Figure 6.5 (a) Reproduction in animals

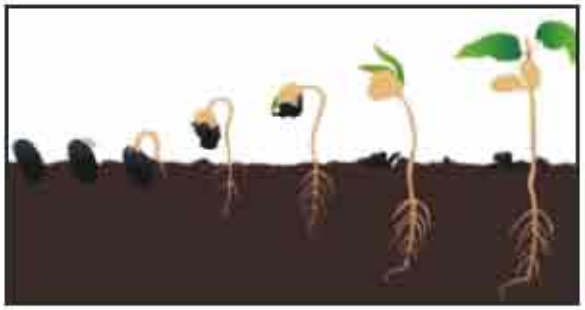


Figure 6.5(b) Germination and growth in plants

(viii) Living beings have a fixed life span

- Do all living beings have a fixed life span?
- Do all living beings grow?
- Do all living beings die?

It is true that all living beings take birth, they grow and then they die. All living beings have almost fixed life span.

Life and death are the true characteristics of living beings. So, live life happily.

Virus

Virus is the connecting link between living and non-living. They remain as non-living during their independent phase. As soon as they enter living beings, they start normal growth (multiplication) and show other such characteristics of living beings. They cause various diseases in plants and animals.

Figure 6.6 : Virus

Jagdish Chandra Bose

Acharya Jagdish Chandra Bose was born on 30 November, 1858 and he spent his childhood in Rarroli village (now in Bangladesh). Acharya Bose graduated from Calcutta University and completed M.A. from Camilton University, Cambridge. In 1896, he achieved a doctorate degree in science from London University. He was selected as a fellow of Royal Society in 1920. He conducted important researches in the field of physics and biology. Acharya Bose invented an extremely sensitive instrument called Cesco graph, to measure the slow growth in plants. He experimentally proved the sensitivity of plants. At the end of the 19th century, the works of J.C. Bose, brought fame to India, worldwide. In 1898, it was proved that Marconi's wireless receiver was invented by Jagdish Chandra Bose. Acharya Bose invented an instrument which could produce microwaves, which ranged from 25 millimeter to 5 millimeter in length.

What have you learnt

- Two types of things are found in our surroundings- living and non-living.
- Some characteristic features of living beings are nutrition, growth, respiration, movement, response towards stimuli, excretion, reproduction and fixed life span.
- Reproduction ensures the existence of the species of living beings.
- Virus are the connecting link between living and non-living.
- Virus are non-living during independent phase but as soon as they entire living beings, they acquire characteristics similar to living beings.

Exercises

Choose the correct option

1. It is a connecting link between living and non-living?

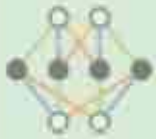
   (a) virus (b) table ( )

   (c) cow (d) none of these

2. This is essential for the existence of species of the living beings?
   (a) respiration (b) reproduction ( )
   (c) movement (d) growth

Fill in the blanks

1. Living beings _____ towards stimuli.
2. Plants prepare their own food by the process of _____.
3. During respiration, animals use _____ and give out _____.
4. Bending of sunflower plant towards the sunlight is a characteristic of _____.



Short answer type question

1. Make a list of the characteristics found in living beings?
2. What is respiration? Explain.
3. Give an example to demonstrate movement in plants.
4. Mention two examples which show that plants respond towards stimulus.

Long answer type question

1. Explain movement in animals and plants giving example of each.
2. Differentiate between living and non-living, by giving examples.
3. Describe the response towards stimuli in animals and plants.

Practical work

1. Observe the daily life of any one animal and write the observations in a notebook.
2. Prepare a chart on the characteristics of living beings and display it in your classroom.

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