

# 01

# Wonders of the Living World

The environment is our surrounding including us. It consists of land, water bodies, houses, plants, animals etc.

Let's do the following activity to find out the components of the environment.



## Activity 1.1

- Observe your classroom & the environment outside the classroom (school garden).
- Then, list out what you could see in the environment.

You can observe many different things in the environment as well as in the classroom. Different environments consist of different components. Find out the things that you can see in the following environments. (Fig. 1.1)

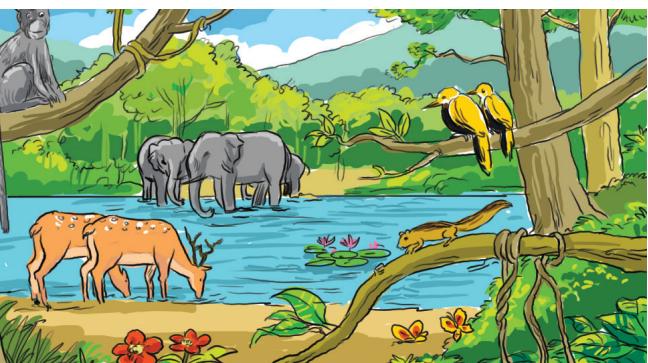


Fig. 1.1 ▾ Different environments

Let's identify the nature of the components of the environment. Can you wear a pair of shoes that you used when you were a baby? No, you can't. Why is that?

Now, the size of your body is larger than earlier. **The increase in size, height or amount is called growth.**



Fig. 1.2

Can you see a growth in everything in the environment? Let's do the following activity to find about it.



### Activity 1.2

- Complete the following grid using the things you listed in Activity 1.1.

Things that grow	Things that do not grow
<b>child</b>	<b>pencil</b>

It is clear that there is a growth in some components while there is no growth in some components.

Components with a growth are called **living things** or **living organisms**.

The components without a growth are called **non-living things**.



Fig. 1.3 ▷ Living and non - living things



### Assignment 1.1

- Observe your house and the garden. List out what you can see and categorize them as living and non-living things.

Let's do the following activity to study more about living things/organisms.



### Activity 1.3

- Divide the living things listed in Activity 1.1 and Assignment 1.1 into two more categories.

It is easily understood that the two categories are plants and animals. Therefore, it's clear that living things can be divided into two main groups as plants and animals.

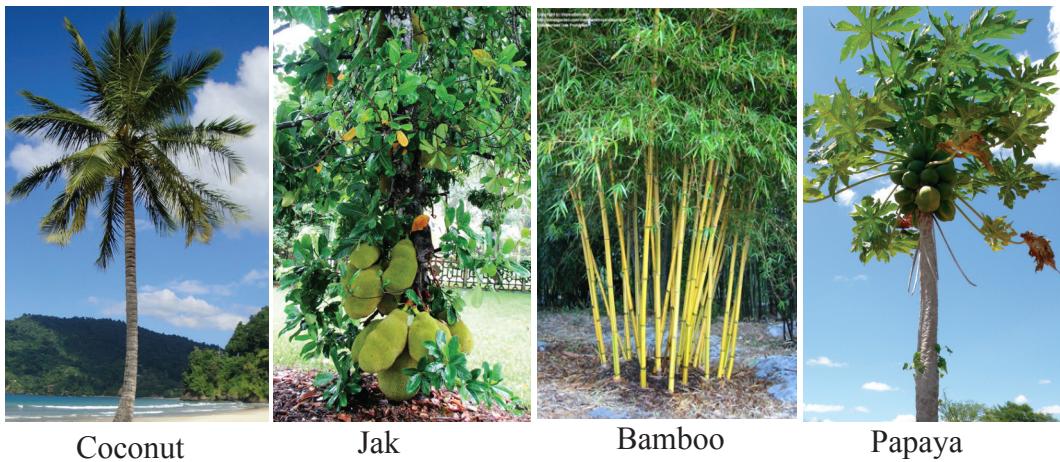


Fig. 1.4 ▲ Some plants

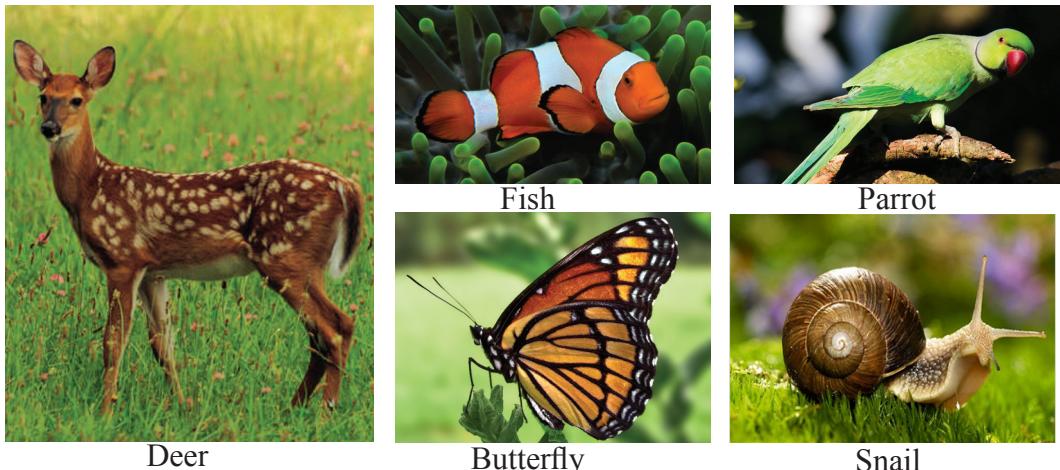


Fig. 1.5 ▲ Some animals

Are there any other organisms except plants and animals?



#### Activity 1.4

**You will need :-** some water taken from a pond, water rotted with hay, a compound microscope, slides and cover slips

**Method :-** Put the water taken from a pond on to one slide and water rotted with hay on to another slide. With the help of your teacher, observe them under the compound microscope.

When you observe the two water samples under the microscope, you will be able to observe some tiny organisms. These organisms that cannot be observed with the naked eye, are called **micro-organisms**. Some micro-organisms that can be observed in the water taken from a pond are shown in Fig 1.6.



Fig. 1.6 ▶ Some micro-organisms in a drop of water

The compound microscope is used to observe things that cannot be seen with the naked eye.

A large number of micro organisms can be seen in water, soil, air and in rotten food.



### Assignment 1.2

Make a booklet including

- information about micro - organisms,
- uses of micro - organisms,
- harms of micro - organisms.

Fig. 1.7 ▶ Compound microscope



Accordingly, organisms can be divided into three main groups. They are **plants, animals and micro-organisms**.



### Assignment 1.3

With the help of your teacher design an experiment to show that there are micro organisms in soil.

## 1.1 Characteristics of Organisms

### ►► Growth

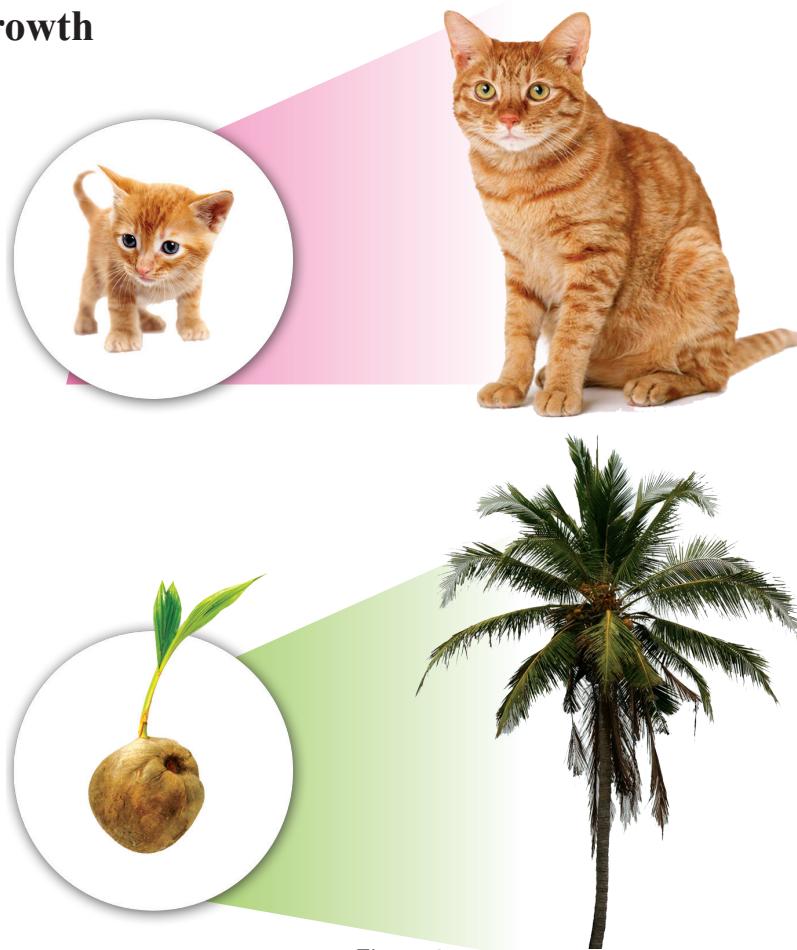


Fig. 1.8

The above photographs show how the size of plants and animals is increased with age. **This increase in size, height or amount is called growth.** Growth is a common feature of organisms. There is no growth in non-living things.

Let's do the following activity to understand further about the growth of organisms.



## Activity 1.5

### You will need :

few yoghurt cups with wet soil, some green gram seeds, a measuring tape

### Method :

- Soak the seeds in water for one day.
- Plant the seeds in the yoghurt cups with wet soil (make some holes at the bottom of the yoghurt cups).
- When the seeds are germinated and grown up to a certain height, start measuring the height of the plants and observe the nature of the leaves daily. (Get the help of your teacher)
- Repeat it for two weeks.
- Fill in the following grid with your observations.

Date	Height of the green gram plants	Number of leaves

You can observe the growth of the plants with time. (Fig 1.9)



Fig. 1.9 ▲ Germination and growth of a seed

## ►► Nutrition

All organisms including humans need food for survival. **Satisfying the food requirements of organisms is called nutrition.**

Most green plants produce food within themselves. Hence, these plants are called **autotrophic**.

They use carbon dioxide from air, soil water and sun light to produce food. This process is called **photosynthesis**.

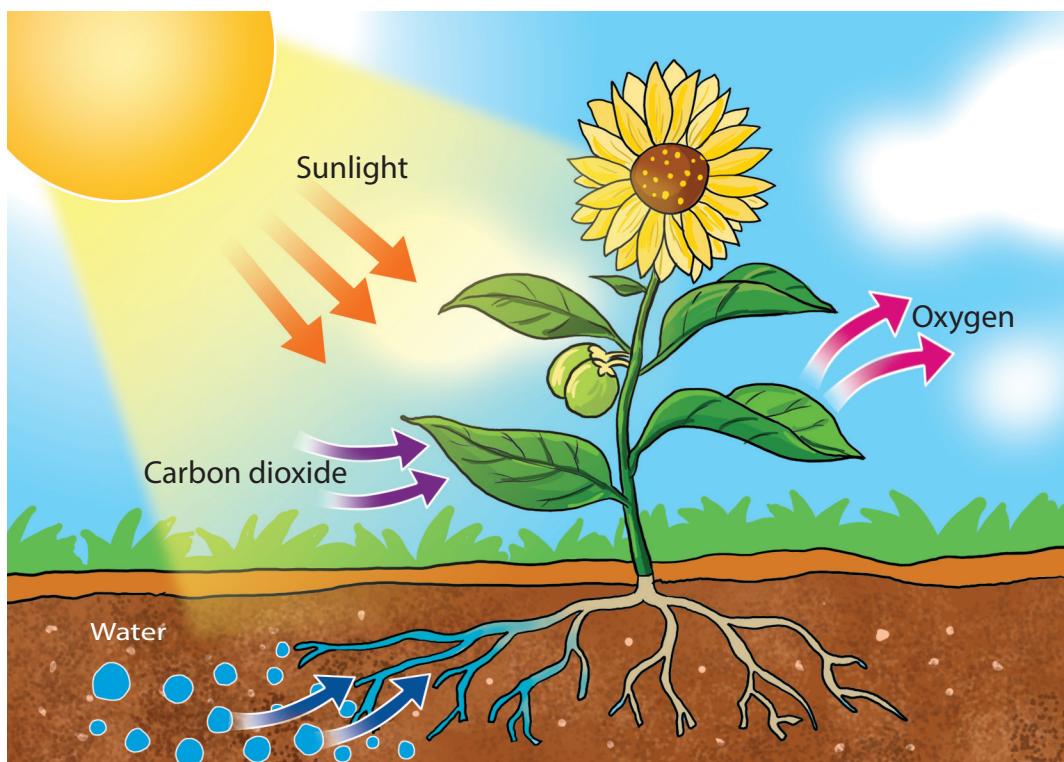
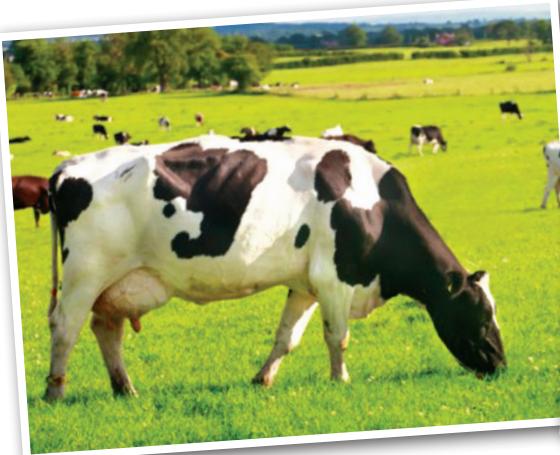


Fig. 1.10 ► Photosynthesis

Animals can't produce their own food. They depend on plants directly or indirectly. Therefore, animals are considered as **heterotrophic**.

Animals such as deer, cows etc. take plants as food. They depend on plants, directly. But animals such as tiger, lion take flesh as food. So, they depend on plants indirectly.



A cow eating grass

A lion eating an animal

Fig. 1.11



### For your extra knowledge

During the process of photosynthesis, plants absorb carbon dioxide and release oxygen. So, the amount of these two gases in the air can be kept constant.

## ► Movement

Showing different movements is a common feature of living organisms. Apart from movements, some animals can move from place to place. Animals moving from one place to another place is called **locomotion**. There are special appendages for animals for locomotion. Several locomotions of animals are shown in fig 1.12 below.



Swimming

Creeping

Running



Flying



Walking

Fig. 1.12

There are some animals that cannot move, but they show different movements. Sea Anemone, Coral Polip living in oceans are such animals.(Fig 1.13)



Sea Anemone



Coral Polip

Fig. 1.13



#### Assignment 1.4

Mention different types of appendages used by animals for their locomotion and write names of animals as examples.

After a touch, the leaves of a touch me not (*Mimosa*) plant shows a sleeping movement. Also, *Albesia*, *Sesbenia* (Kathurumurunga/Agaththy), Tamarind leaves show sleeping movements in the evening. These are some examples of movements of plants.

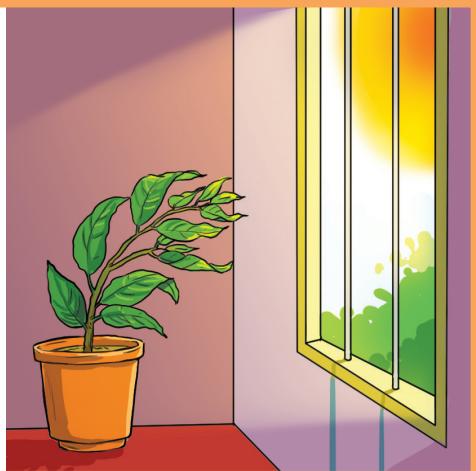


Fig. 1.14 ▲ Touch me not plant (*Mimosa*)

Although, plants show many other movements, they cannot be observed during a short period of time.

When a plant is kept on a window sill, after some days the stem of the plant bends towards the sunlight. This too is a movement of a plant.

Fig. 1.15 ▶ Plant bending towards sunlight



Non-living things do not move on their own. Non-living things will move only when an external force is applied.

## ►► Respiration

When a person is lying in a relaxed position, you will see that his chest and the stomach move up and down. Why?

It is because we take air in (inhale) and release air out (exhale). **Oxygen in the air, once breathed in, reacts with the food stored in the body and produces energy. This process is called respiration.** In the process of respiration, oxygen is used and carbon dioxide is released.

Oxygen needed to breathe is taken in by inhaling while the produced carbon dioxide is released by exhaling.

The chest moves up and down because of the process of inhaling and exhaling. These movements are called **respiratory movements**.

Plants too breathe. But, they do not show respiratory movements as animals.

Respiration is a common feature of every organism. There is no respiration in non-living things.



### Assignment 1.5

Observe and report the respiratory movements and respiratory organs of different animals.



### For your extra knowledge

The patients with respiratory difficulties are given oxygen artificially. Also, mountain climbers and divers use artificial oxygen.

Let's do the following experiment to find out whether exhaled air contains carbon dioxide.



### Activity 1.6

**You will need :** a straw, a test tube, colourless calcium hydroxide solution

#### Method :

- Put some colourless calcium hydroxide solution into a test tube.
- Then bubble the exhaled air into the test tube as shown in the Fig.1.16.
- Record your observations.



Fig. 1.16

You will see that the colourless calcium hydroxide changes into off white. This happens due to the presence of carbon dioxide. Hence, the exhaled air contains carbon dioxide.

## ►► Reproduction

It is obvious that every organism dies one day or the other. So, for the continuation of the living world it is essential to have new generations.

**A matured living being producing new members of the same species is known as reproduction.**

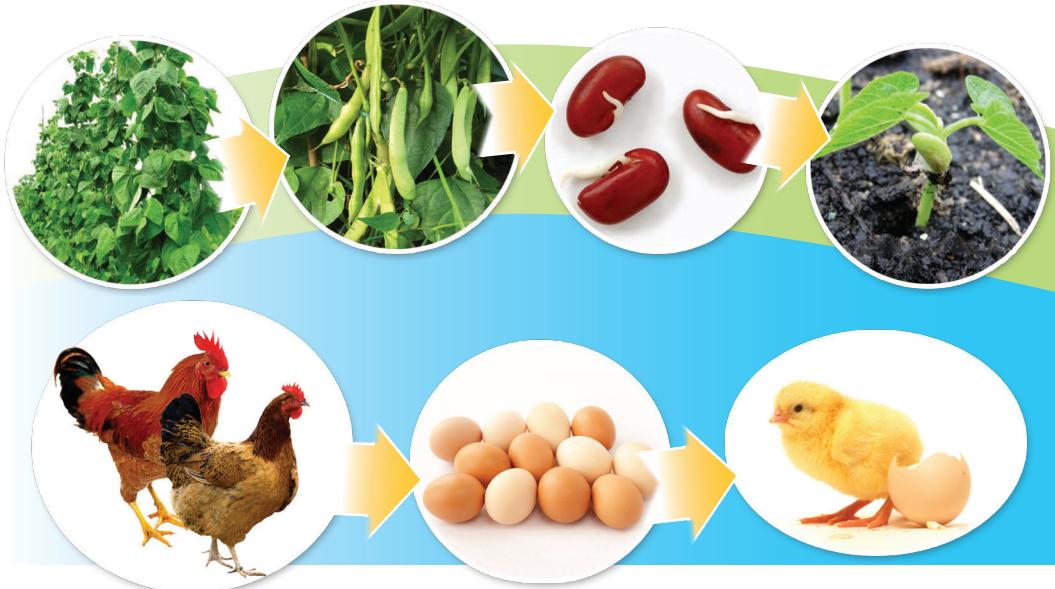


Fig. 1.17 ▲ Reproduction of some plants and animals

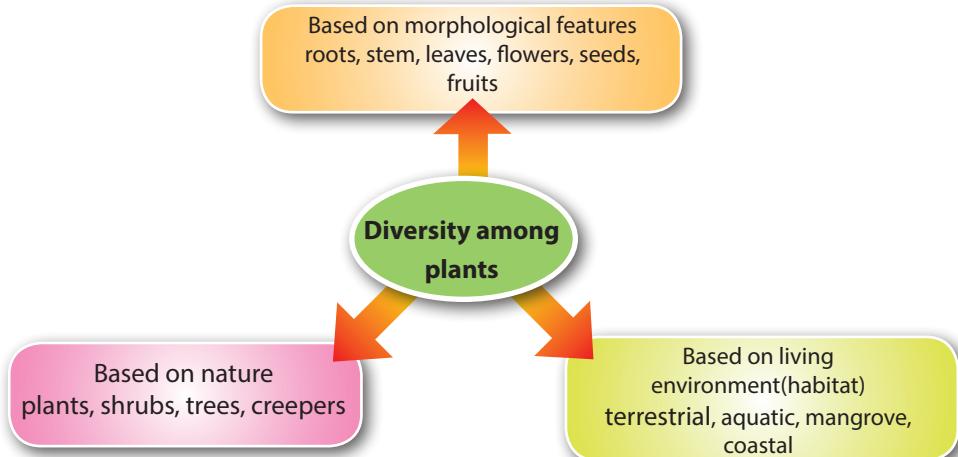
Fig 1.17 shows the reproduction of some plants and animals.

Reproduction of organisms occurs in different methods. Reproduction is essential for the existence of living organisms. It's common for all organisms. Reproduction does not occur in non-living things.

## **1.2 Differences between Animals and Plants**

### **►► Diversity of Plants**

- There is a vast diversity among plants and animals in the environment.
- Based on the nature of plants, they can be categorized as plants, trees, shrubs and creepers.
- Also there is diversity among plants in relation to morphological features such as roots, stem, leaves, flowers, shape, size and colour of fruits and seeds.
- Plants grow not only on the terrestrial environments but also, on aquatic, coastal and mangrove environments.

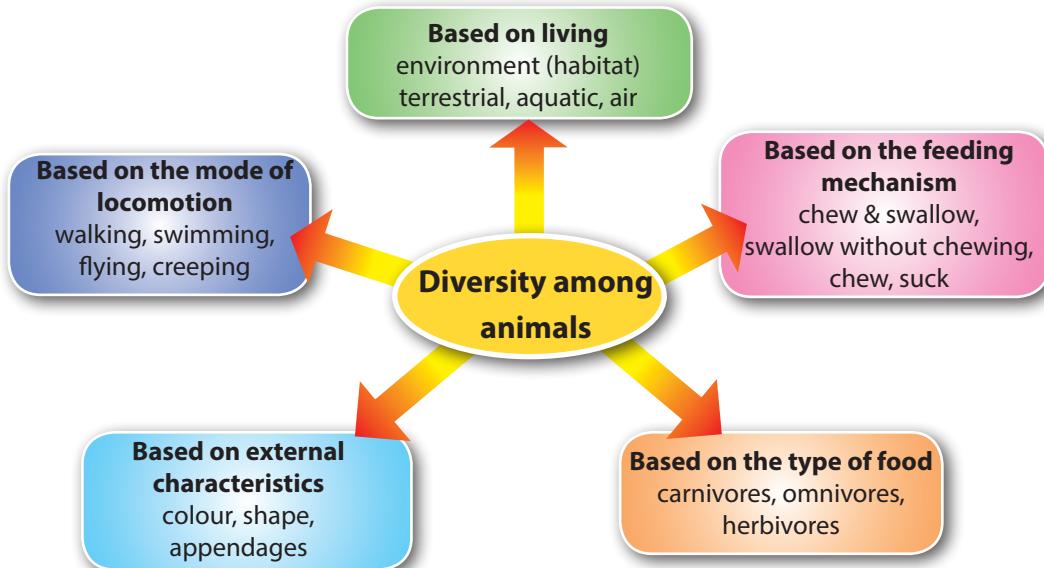


### Assignment 1.6

Observe the plants in the environment. Categorize them as plants, shrubs, trees and creepers. Draw their flowers, leaves, seeds, fruits etc. to identify the diversity of plants.

## ►► Diversity of Animals

The following figure shows that there is a vast diversity among animals too.



You will learn more about the diversity among animals and plants in your upper grades. Diversity among animals and plants is a very important factor for the environment. It increases the beauty of the nature too. So, it is our responsibility to care for and conserve the animals and plants. You must not discharge harmful materials to the environment. Hence, you too can take part in protecting the wonder of the nature.



### Activity 1.7

- Study some plants and animals and identify the differences between them.
- Fill in the following grid using the data you gathered.

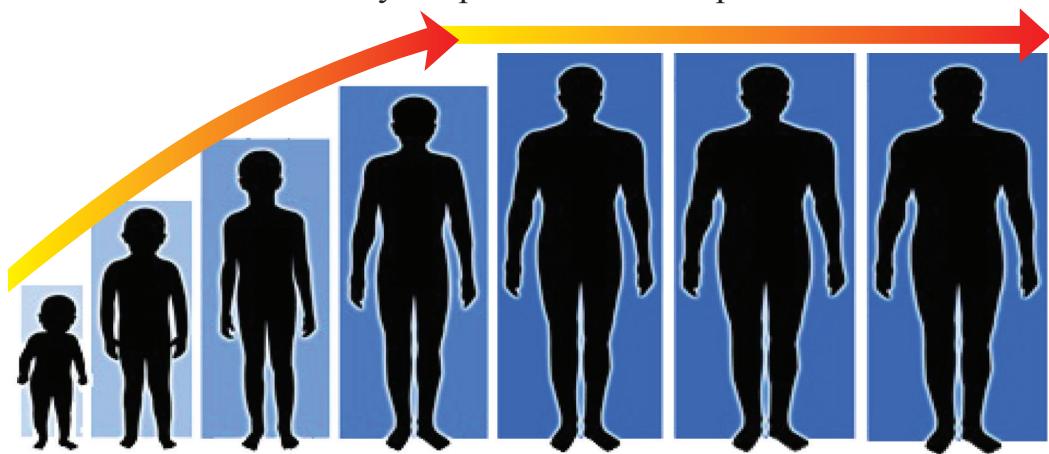
Characteristics of plants	Characteristics of animals

Compare the following table with the table you completed above.

Table 1.1

Characteristics of plants	Characteristics of animals
Plants grow fixed to the ground. They do not show locomotion, but show movements.	Animals show locomotion.
Produce their own food by photosynthesis. Hence, they are autotrophic.	Do not produce their own food. Depend on other plants and animals for food. Hence, they are heterotrophic.
Chlorophyll is present within the cells.	Chlorophyll is absent within the cells.
Growth is visible during the entire life span. Thus, growth is unlimited.	Growth in animals visibly stops after a certain period of time.

Growth in animals visibly stops after a certain period of time.



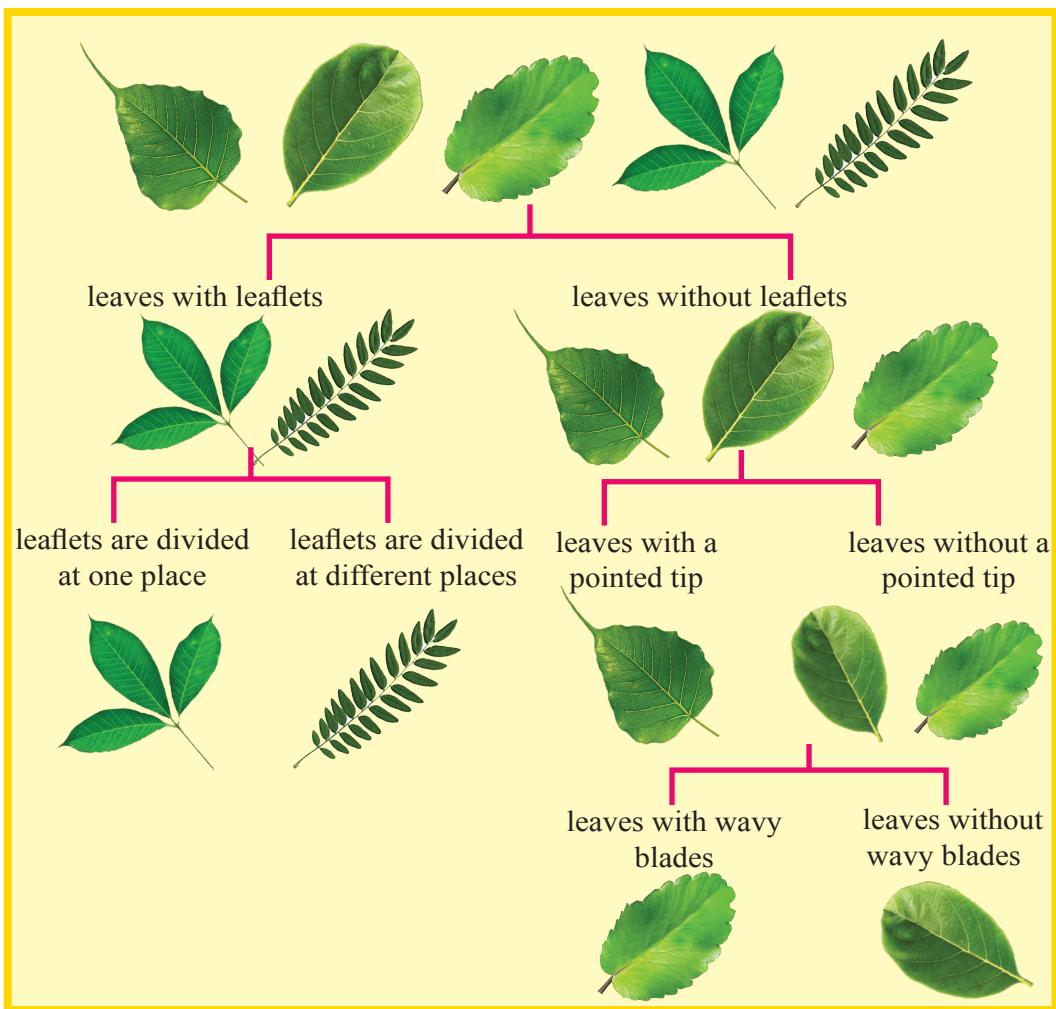
Growth is visible during the entire life span.

## ►► Dichotomous Keys

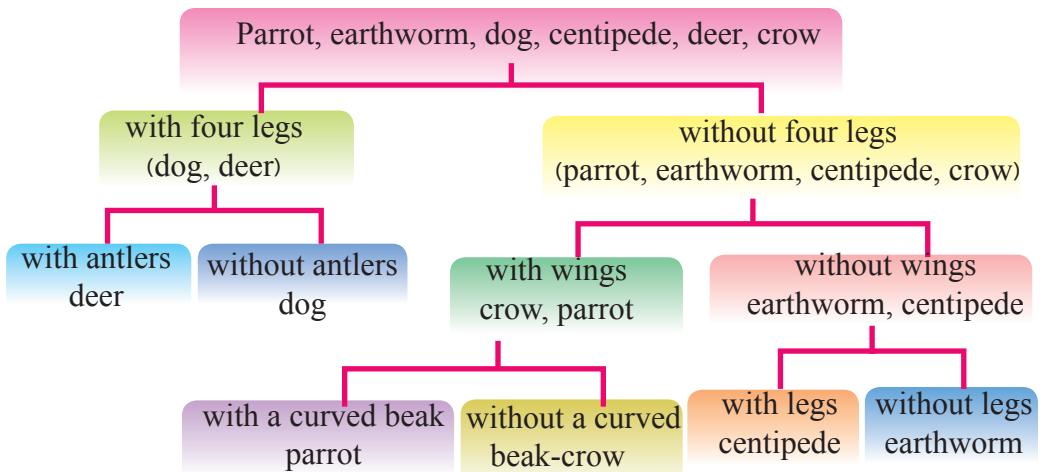
It is very easy to use dichotomous keys to classify and identify organisms.

Categorization of organisms using the presence or absence of a characteristic feature is known as a **dichotomous key**. It is more suitable to use external features that can be easily observed.

Following figure shows how a dichotomous key is used to classify and identify some leaves.



Following dichotomous key shows a classification of some animals.





## Assignment 1.7

Select 6 plants from the school garden and prepare a dichotomous key to classify them. Show your dichotomous key to your teacher.



## Summary

- There are living things (organisms) as well as non - living things in our environment.
- Organisms can be classified into 3 major groups as plants, animals and micro-organisms.
- Growth, nutrition, respiration, movements and reproduction are the main characteristics of living organisms.
- There are many differences between plants and animals.
- There is a vast diversity among animals as well as among plants.
- Dichotomous key can be used to classify and identify plants and animals.

## Exercise

01. Select the most suitable answer.

(i). A characteristic that is not common to all living organisms.

- |                |                   |
|----------------|-------------------|
| a) respiration | b) photosynthesis |
| c) growth      | d) reproduction   |

(ii). The process that creates energy in organisms is

- |                 |                |
|-----------------|----------------|
| a) growth       | b) nutrition   |
| c) reproduction | d) respiration |

(iii). The chemical that can be used to identify carbon dioxide in the laboratory is

- |                    |                      |
|--------------------|----------------------|
| a) copper sulphate | b) calcium hydroxide |
| c) water           | d) coconut oil       |

- (iv). The gas emitted during the process of photosynthesis is
- a) oxygen
  - b) carbon dioxide
  - c) nitrogen
  - d) hydrogen
- (v). The most suitable equipment to observe the micro-organisms in water is
- a) telescope
  - b) compound microscope
  - c) magnifying glass
  - d) binocular

02. Select the most suitable word and fill in the blank.

- (i). The energy needed for photosynthesis is supplied by ..... (sun / man).
- (ii). There ..... (is / isn't) a limit of growth within plants.
- (iii). Most of the animals are ..... (autotrophic/ heterotrophic).
- (iv). A characteristic which can be seen in animals but cannot be seen in most plants is ..... (locomotion / reproduction).
- (v). An essential requirement for photosynthesis is ..... (oxygen / carbon dioxide).

03. Use a dichotomous key to classify the given plants.

grass, mango, guava, hibiscus, coconut

04. Use a dichotomous key to classify the given animals.

cat, butterfly, cock, cow, rat snake, leech

## Project

Go on a field trip to study further about the characteristics and diversity of organisms which you studied in the lesson "Wonders of the Living World." Make a plan with your teacher to organize the trip.

### Technical Terms

Organisms	- தீவின்	- உயிரங்கிகள்
Non living things	- அதீவி இலங்கள்	- உயிரற்றவை
Environment	- பரிசுரய்	- சூழல்
Micro - organisms	- குறை தீவின்	- நுண்ணங்கிகள்
Growth	- வளர்ந்து வருதல்	- வளர்ச்சி
Nutrition	- பெருக்குதல்	- போசனை
Movement	- வழங்குதல்	- அசைவு
Locomotion	- சுலபமாக மாற்றுதல்	- இடப்பெயர்ச்சி
Reproduction	- பூர்வநாயகமாக்குதல்	- இனப்பெருக்கம்
Respiration	- ஓய்வு விடுதல்	- சுவாசம்
Photosynthesis	- ஒளியூத்துப்பு	- ஒளித்தொகுப்பு
Diversity	- விவில்தல்	- பல்வகைமை
Dischotomous key	- எட்டுப்படிமுறை	- இணைக்கவர்ச்சுட்டி
Autotrophic	- சீவுமூல விடுதல்	- தற்போசனி
Heterotrophic	- விதமாக பெருக்குதல்	- பிறபோசனி