



Can you recall?

Characteristics of living things

There are many kinds of plants and animals around us. They show some similarities and some differences. Yet, with the help of certain features, we can tell that they are all living things. These features are not seen in non-living things. Such features are said to be the characteristics of living things. Let us study these characteristics.



2.1 : Various things in our environment



Can you tell?

What differences do we see between the young ones and the adults in the picture?

Growth



2.2 : Growth in living things

A baby grows up to become an adult person – woman or man. During the period of its growth, the baby gains in height, weight and strength. In the same manner, all animals grow into adults in a certain period. Generally, humans require 18 to 21 years for this growth.

Find out how long it takes for the young ones of hens, cows and dogs to grow into adults.



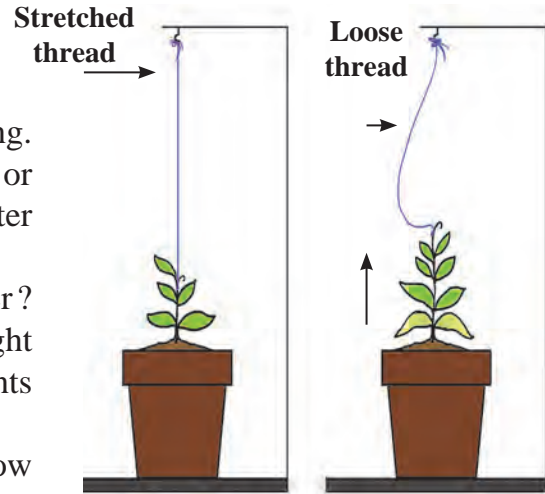
Try this.

Tie a thread to the tip of a potted sapling. Keep the thread stretched and tie it to a peg or nail above the plant. What do you observe after ten to fifteen days?

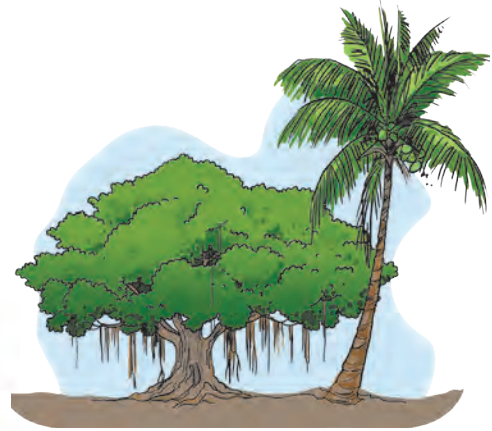
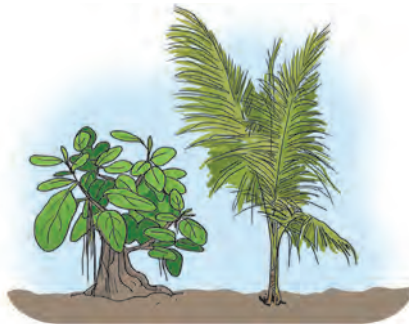
What tells us that the plant has grown taller?

In all plants, it is mainly the width and height of the stem that grows. As they grow, some plants develop branches while others do not.

Though all living things grow, animals grow only for a certain period. Plants, on the other hand, grow as long as they live. The growth of living things occurs from within the body, which means that growth occurs in all parts of the body.



2.3 : Sapling in a pot



2.4 : Growth in banyan and coconut trees

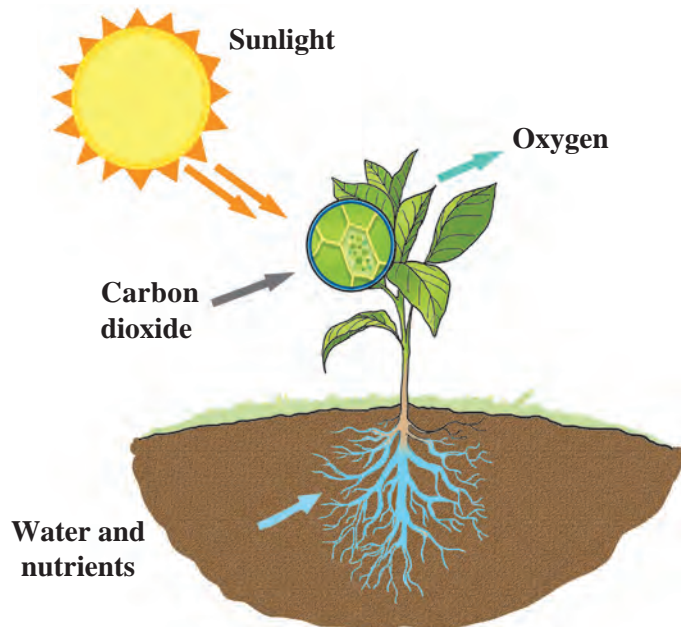


Use your brain power!

What differences do you see in the growth of trees like the mango, banyan and peepal and that of the bamboo, coconut and toddy palms.

Food is necessary for growth

Plants make their own food in sunlight. Plants produce food from water, nutrients in the soil and the carbon dioxide present in the air. This process takes place in the leaves of plants. It is brought about in the presence of sunlight, with the help of the chlorophyll in the leaves. This process of food production is called photosynthesis. During this process, plants give out oxygen. Plants appear mainly green in colour due to the chlorophyll in them.



2.5 : Photosynthesis



2.6 : Intake of food by animals

Animals, however, do not have chlorophyll. They do not produce their own food. They search for food. Animals such as goats, sheep, horses eat grass while wild animals such as tigers and lions meet their need for food by hunting other animals which live on plants.

The intake of food and the resultant growth is an important characteristic of living things.



Observe and discuss.

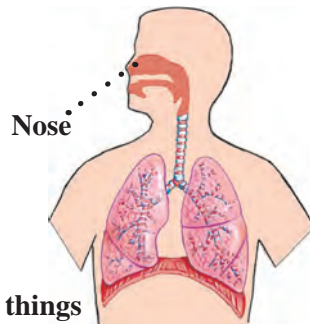


A leaf of a plant

Respiration

1. Hold your hand in front of your nose or keep your hand on your chest. What do you feel ?
2. If we observe a sleeping dog, what movement of its belly do we see ?

Living things need oxygen in order to live. Inhaling oxygen and exhaling the carbon dioxide formed in the body due to the use of oxygen is called respiration. Animals such as fish, snake, mouse, etc. have specific organs for respiration. On the other hand, plants respire by means of microscopic pores on their stems and leaves.



Respiration is a characteristic of living things.

2.7 : Respiration in living things



Can you recall ?

1. Is all the food we eat used by the body ?
2. What is the unused part of food converted into ?

Excretion

Waste substances are formed during the many processes that take place in the bodies of animals. These are called excreta and the process of eliminating them from the body is called excretion. Animals have specific organs for excretion.

Plants, too, excrete. For example, some plants shed leaves in a specific season. Waste substances stored in the leaves of plants are shed along with the leaves.



2.8 : A tree shedding leaves



Try this.

Take a transparent plastic bag. Tie it over a leaf of a plant as shown in the picture. Observe it after six to seven hours. What do you see?

Droplets of water collect on the inside of the bag. It means that, plants excrete water in the form of vapour.

Excretion is a characteristic of living things.



Use your brain power!

What is the sticky substance seen on the stems of the babul (acacia) or drumstick trees?



2.9 : Excretion on the leaves of a plant



Observe and discuss.

Have you experienced this? What happened immediately after the following actions?

1. Light flashed suddenly into your eyes.
2. Suddenly you felt a pinprick.
3. The leaves of the mimosa plant were touched.
4. At sunset, lamps on the street or courtyard are lit and insects gather around the lamps.



The mimosa

Responsiveness to stimuli and movement

Living things act in various ways when responding to a stimulus. If you suddenly enter a cowshed, the cows and buffalos stand up, begin to move, one or two may even start mooing. These are all movements.

A creeper planted in the courtyard leans towards a support. A potted plant placed in a window grows towards sunlight. It means that plants, too, show movement. Living things move of their own accord.

The movement or the change taking place in a living thing at such a time is their response to a stimulus. An event that occurs in our surroundings is a stimulus. The ability of living things to respond to a stimulus is called their responsiveness to stimuli.



A potted plant

2.10 : Responsiveness and movement



Use your brain power!

1. In each of the examples given above, what is the stimulus and what is the response?
2. What is the main difference between the movements of plants and animals?

Responsiveness to stimuli is a characteristic of living things.



Can you tell? What do we learn from these pictures ?

Reproduction

Living things produce other living things like themselves. Some animals give birth to their young ones. Some lay eggs. Their young ones hatch out of the eggs. New plants are produced from the seeds, stems or leaves of plants.

The process by which a living thing generates a new living thing like itself is called reproduction or procreation.

Reproduction is a characteristic of living things.



A bird and its eggs



Bryophyllum



A mare and her foal



Rose cuttings

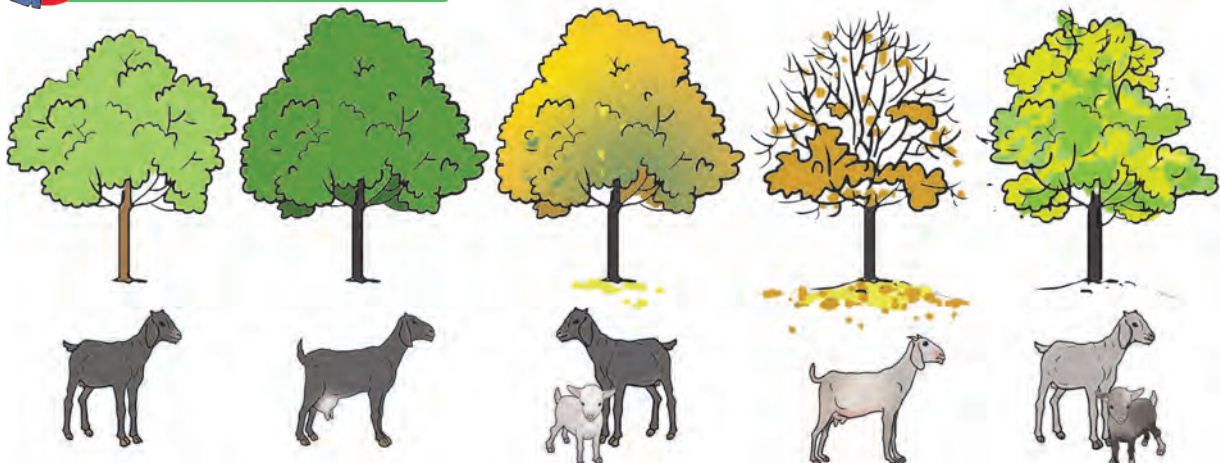


Use your brain power!

Why have so many types of plants and animals been able to survive on the earth even today ?



Observe and discuss.



A definite lifespan

2.12 : Lifespan

At a certain stage of life, living things become capable of reproduction. Later on in life reproduction stage, their organs become weak and still later, their life comes to an end. In other words, living things die. The lifespans of different animals and plants are different. For example, the lifespan of the dog is about 12 to 18 years, while the ostrich lives for 50 years.

You may have wondered what exactly the living things are, how they came into being, and so on.



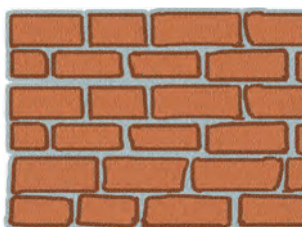
Do you know ?

The lifespan of the giant turtle found on the Galapagos Island in South America is about 170 years. On the other hand, the lifespan of the mayfly ranges from 1 hour to 24 hours.



Can you tell ?

Observe a honeycomb and a wall.
What are they made of ?



2.13 : A wall



A honeycomb

You may have seen the small compartments of a honeycomb. These compartments are joined together to form a honeycomb. A wall has bricks. To construct a wall, we firmly join the bricks together.

A cellular structure

Living things are made of small units called cells. All the actions and processes in the bodies of living things are brought about with the help of these microscopic cells.

Some living things are made of a single cell. These are called **unicellular organisms**. On the other hand, the living things that are made of many cells are called **multicellular organisms**. The amoeba and some other microorganisms are unicellular while man, cow, mouse, cockroach, elephants, banyan tree, the onion plant, etc. are all multicellular organisms. All the characteristics of living things are seen in every cell of a living thing, whether it is unicellular or multicellular.



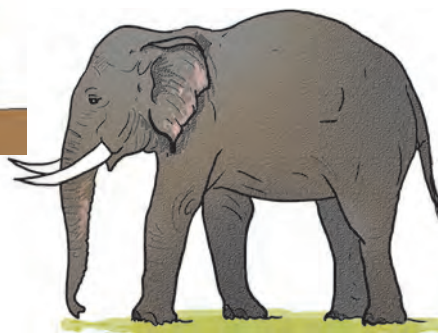
Amoeba



Paramoecium



Cellular structure is the main characteristic of living things, even though the number of cells may vary.



2.14 : Various living things

Institutes at work

The institutes that work for the survey and conservation of the various plants and animals in different parts of India are the Botanical Survey of India (1890) and the Zoological Survey of India (1916) respectively. In case you find an unfamiliar plant or animal in your surroundings, you can communicate with these institutes to obtain more information about it.



Can you tell?

In what way are plants and animals useful to us?

Useful living things

Plants are used for household as well as industrial purposes. For example, fenugreek (*methi*), potato, okra (*bhendi*), apple, banana are used as food while *vasaka* (*adulsa*), *hirada*, *behada*, asparagus are used as medicines.

Animals are also useful to us. Dogs, cats, cows, buffalos are kept for domestic uses. Fish, sheep, fowl are used as food, while animals like horses, oxen, camel prove useful in various occupations. The earthworm is very useful in agriculture.



Vasaka



2.15 : Useful living things

Harmful living things

Some animals and plants around us are harmful to man. For example, mosquitoes and flies spread diseases. Cockroaches, mice, rats destroy our food. Lice, ticks also spread diseases. The bites of some poisonous lizards, spiders, snakes and scorpions can even cause death. If wild elephants enter human settlements, they cause a lot of destruction.

Some plants, too, can be harmful, as for example, the dodder, parthenium and other weeds.

Pods of the nettle, colocasia leaves cause itching. Plants like oleander, lantana have strong odours. The *datura* plant is poisonous. Uncontrolled growth of fungi and algae in water pollutes drinking water and may cause the spread of diseases.



Datura



Colocasia leaves

2.16 : Harmful living things

Wild animals

Wild animals that hunt other animals for food are called predators, for example, tigers, lions, wolves, leopards. Sometimes, due to deforestation, such animals enter human settlements in search of food and may kill domestic animals or people.



2.17 : Wild animals



Find out.

Watch TV channels such as National Geographic, Discovery and collect information regarding various plants and animals found in our surroundings. Have a class discussion with reference to the collected information.



Always remember...

Many plants and animals in nature satisfy our needs. The use of such plants and animals should be restricted only to our needs. We should not pluck leaves, flowers and fruit unnecessarily. Animals should not be hunted. They should not be teased just for fun. It is the responsibility and duty of all of us to protect plants and animals.



What we have learnt-

- Growth, respiration, excretion, reproduction, responsiveness to stimuli, movement, a definite lifespan and a cellular structure are the characteristics of living things.
- Animals grow for certain period of their life. Plants, however, grow as long as they live.
- Animals have specific organs for respiration, while plants respire through microscopic pores on their leaves and stems.
- The process of eliminating waste products from the body is called excretion.
- All living things have the ability to reproduce.
- Living things move because of their ability to respond to stimuli.
- Plants show spontaneous movements but they cannot leave their place and go elsewhere as animals do.
- Living things have a definite lifespan at the end of which they die.
- Many animals and plants are useful to us in our daily life. Some animals and plants can be harmful to us.
- The smallest unit of a living thing is the cell.



Exercise

- Write the answers to the following questions in your own words.**
 - What are the differences between plants and animals?
 - What are the similarities between plants and animals?
 - How is the plant kingdom useful to us?
 - How is the animal kingdom useful to us?
 - What makes living things different from non-living things?
- What helps them to breathe?**
 - A fish
 - A snake
 - A crane
 - An earthworm
 - Man
 - A banyan tree
 - A caterpillar
- Fill in the blanks with the proper words from the brackets.**
 - The process by which plants make their own food is called
 - To inhale and to exhale is called respiration.
 - The elimination of waste substances from the body is called
 - The ability to respond to an event is called to
 - On completing their lifespan, every living thing
(oxygen, dies, excretion, carbon dioxide, responsiveness, photosynthesis, stimuli)
- Write the uses of these animals and plants.**

Animals : Honeybees, sharks, yaks, sheep, earthworms, dogs, bivalves, horses, mice.

Plants : Ginger, mango, eucalyptus, babul (acacia), teak, spinach, aloe vera, turmeric, holy basil, *karanja*, *moh*, mulberry, grapevine.
- What are the peculiarities of the movements of these living things?**

Living things : Snakes, tortoises, kangaroos, eagles, chameleons, frogs, gulmohur, sweet potato creeper, dolphins, ants, rattlesnakes, grasshoppers, earthworms.
- Write in detail about how the plants and animals found in your surroundings prove useful or harmful.**

Activity :

- Obtain information about the work of the Botanical Survey of India and the Zoological Survey of India by visiting the websites : www.bsi.gov.in www.zsi.gov.in
- Collect information about the lifespan of various animals, make a chart and display it in your class.
- Gather information about the poisonous snakes found in India and present it in a Science Exhibition.

