

THE LIVING ORGANISMS -CHARACTERISTICS & HABITATS

Key Points

- ▶ There is a large variety of things around us. Some of these are living things whereas others are non-living things.

LIVING THINGS

- Those things which need food, water and air for their survival.
- All the animals and plants are living things including human beings.

NON-LIVING THINGS

- Those things which do not need food, water and air for their survival.
- Table or chair.

- ▶ All the living things have some common characteristics (or features) which make them different from non-living things.
- ▶ The living things are called organisms. Thus, all the plants and animals are organisms.

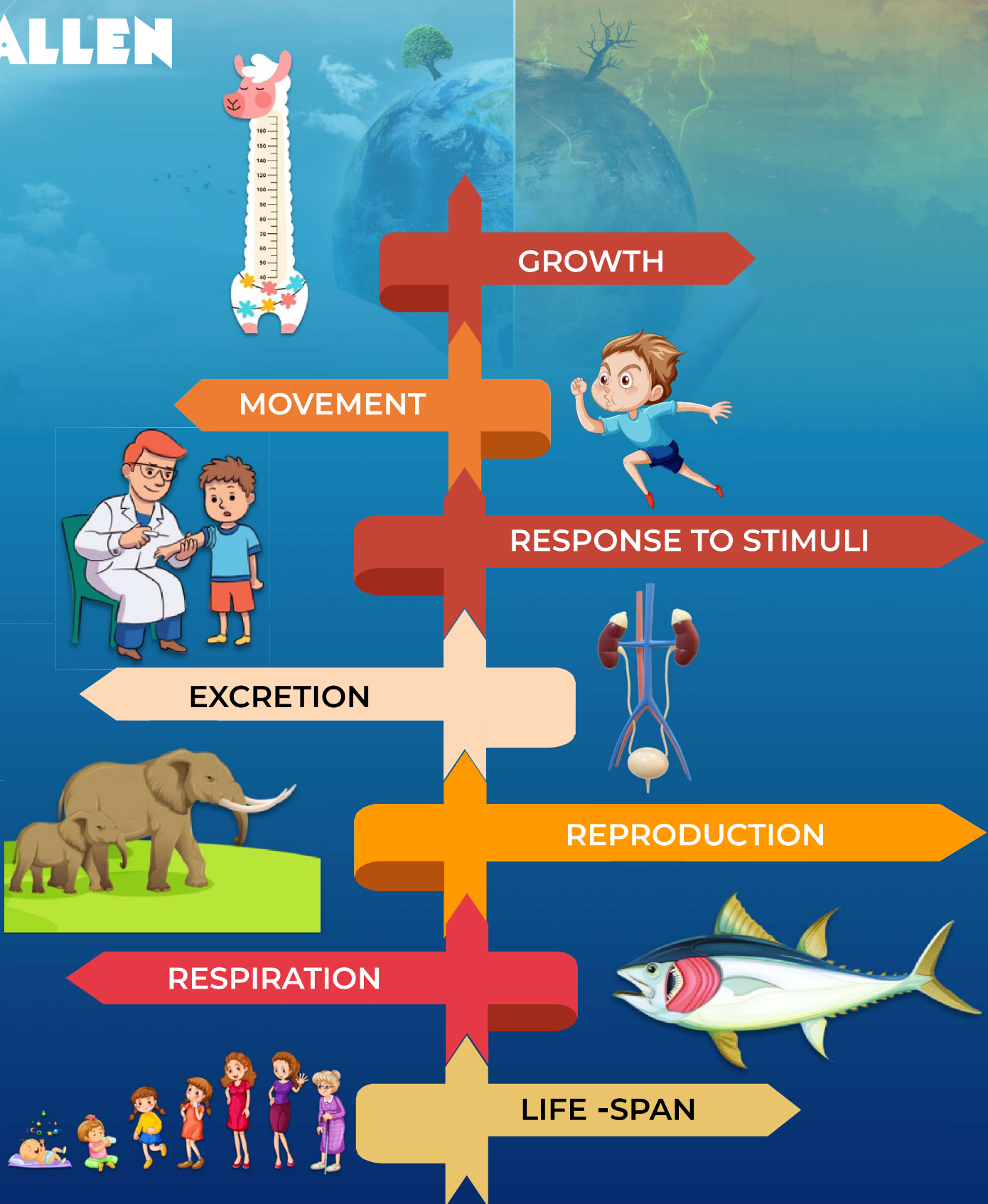
Note

The study of living things (or organisms) is called biology.

Characteristics of living things

FOOD





Food

- ▶ All the living things (plants and animals) need food to stay alive.
- ▶ Food gives the material for growth and energy to carry out various life processes taking place inside the living things.

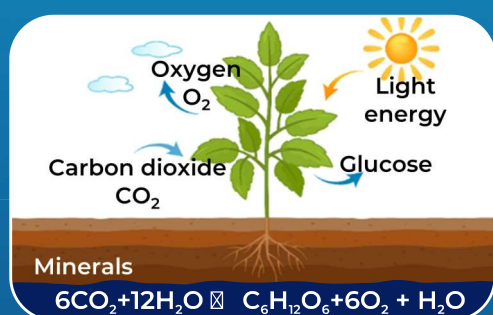
NUTRITION

Autotrophs

Green plants manufacture their own food in their green leaves by photosynthesis.

Heterotrophs

Animals cannot manufacture their own food.



Growth :

- ▶ Growth means increase in size. All the living things can grow.
- ▶ The young ones of all living things (plants and animals) grow and become bigger in size with the passing of time.
- ▶ All the living things grow from a 'single cell'.
- ▶ As the number of cells in living being's increases, it's body grows. Non-living things do not grow.



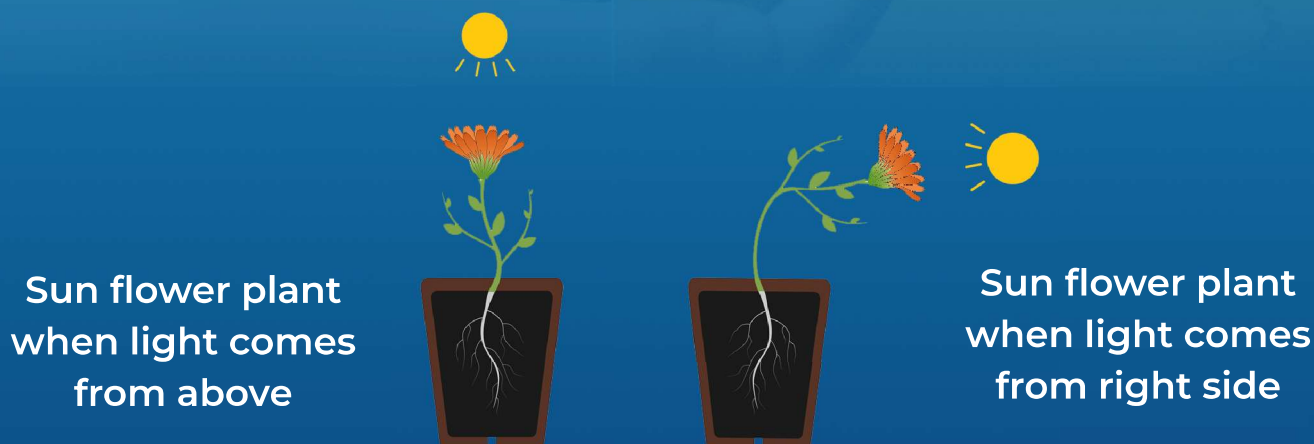
A seed grows to become a plant.



A baby grows to become an adult.

Movement :

- ▶ All the living things move by themselves (without any external help). Animals can move from one place to another or they can move their body parts.
- ▶ Non-living things cannot move by themselves.



- ▶ The plants are fixed in the soil at a place so cannot move like animals but the plants can move only parts of their body such as leaves, flowers, shoots and roots. The plant parts move towards a stimulus such as sunlight, water or gravity.

Note

The movement of leaves, roots, etc., of a plant in response to external stimuli such as light and gravity is called tropism.

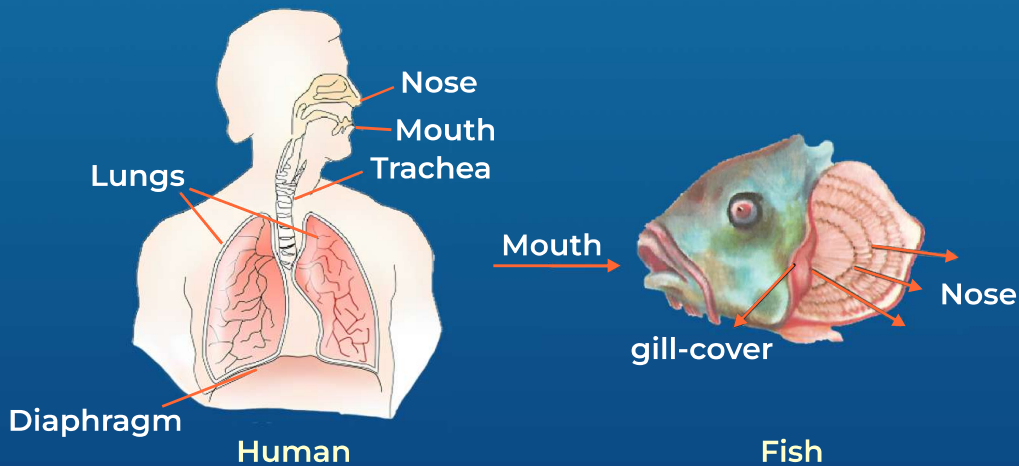
Response to Stimuli :

- ▶ The changes in surrounding to which living things respond are called stimuli ('stimuli' is the plural of stimulus).

	Stimuli	Phenomenon of response
(1)	Water	Hydrotropism
(2)	Temperature	Thermotropism
(3)	Light	Phototropism
(4)	Gravity	Geotropism
(5)	Touch	Thigmotropism

Respiration :

- ▶ All the living things need energy to grow, move and stay alive. They get this energy from food through respiration.
- ▶ Respiration is the chemical process in which food taken by an organism combines with oxygen to release energy. This energy is used by the organism to carry out its various life processes.



Breathing organs in different animals

Note

Whales and dolphins have lungs. They come to the water surface for breathing air. Their nostrils are called blowholes from which the air comes out as if from a blowpipe and produces a shower of water.

	Earthworm	Skin	
	Fish	Gills	
	Human	Lungs	 
	Whales and Dolphins	Lungs	
	Plants	Stomata	

Excretion :

- ▶ The living things produce some waste materials in their bodies during the various life processes.
- ▶ The removal of waste substances from the body of a living organism is called excretion.
- ▶ All the living things get rid of wastes from inside themselves.
- ▶ Some harmful or poisonous waste materials are also produced in plants. Some plants remove their waste products as secretions.
- ▶ Non-living things do not excrete.

Note

All living things remove metabolic waste products. In animals, it is called excretion and in plants it is secretion.

Reproduction :

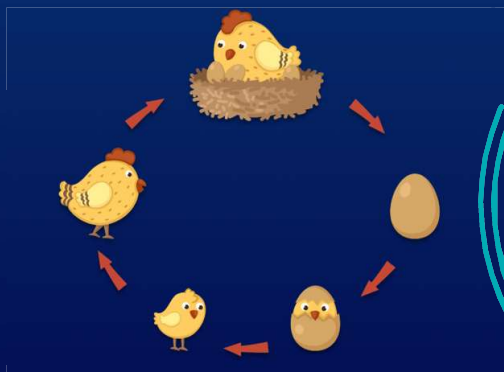
The process by which living organisms produce new members of their species is called reproduction.



Oviparous



Lay eggs



Types of
animals

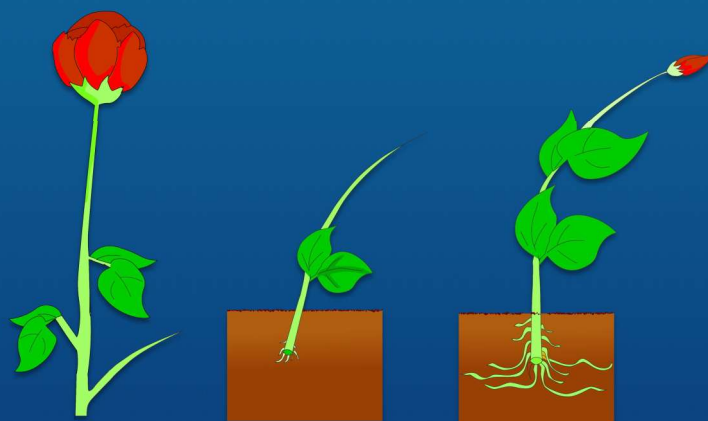


Give birth to young ones



Viviparous

- ▶ Some plants reproduce through cutting
- ▶ A small part of a plant which is removed by making a cut with a sharp knife is called a cutting.
- ▶ A cutting may be a piece of stem, root or even a leaf.
- ▶ In this method, a cutting of the existing plant (say, of stem or shoot) having some buds on it is taken and its lower part is buried in the moist soil.
- ▶ After a few days, the cutting develops roots and grows into a new plant.

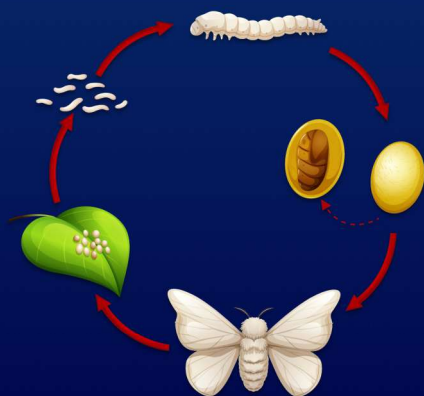


Example :

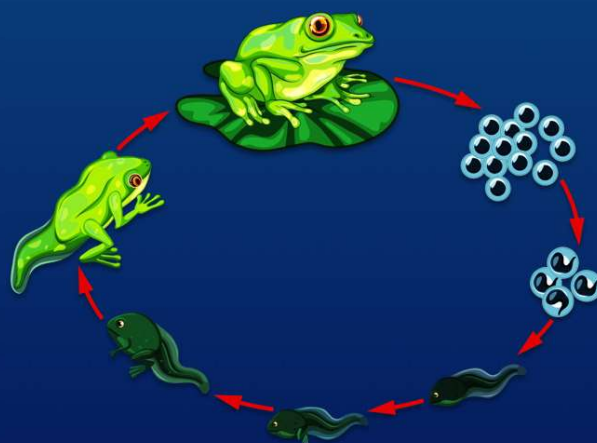
The plants such as rose, henna (mehndi), grapes, sugarcane and cactus, etc. can be grown by the cutting method.

Life-span :

- ▶ Every living thing has a limited life span on the earth. So, reproduction is essential for the survival of a species.



THE LIFE CYCLE OF SILK MOTH



LIFE CYCLE OF FROG

- ▶ All living things follow a cycle of growth & development by which an organism takes birth, grows into an adult, gets old and dies. This is known as the life cycle of organism.

Differences between plants and animals

	Plants	Animals
1	Green plants make their own food by the process of photosynthesis (Autotrophic nutrition)	Animals get their food from plants or other animals. (Heterotrophic nutrition)
2	Plants do not move from place to place since they lack organs for locomotion.	Animals move from place to place since they have organs for locomotion.
3	Plants grow throughout their life. (Unlimited growth)	Growth in animals is limited up to a certain period.
4	Plants show growth at the tips of shoots and roots. (Localised growth)	Animals show uniform growth in their body. (Diffused growth)
5	Plants lack sense organs and they show slow response to external stimuli.	Animal have sense organs and show quick response to external stimuli.
6	Plant cells have cell wall and chloroplasts.	Animal cells do not have cell wall and chloroplasts.

Note

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Habitat

- ▶ The place (or surroundings) where a plant or animal lives is called its habitat. A habitat provides (food, water, air, light, shelter (protection), and a place for breeding to the plants and animals living in it.

Terrestrial



It's a land based habitat.
Desert, Mountains (or Hills), Forest,
Grassland, Garden, Field, Soil and Homes.

Habitat

It's a water based habitat.
Examples- Pond, Lake, River, Swamps
(an area with water logged ground)
and Oceans (or Sea).



Aquatic

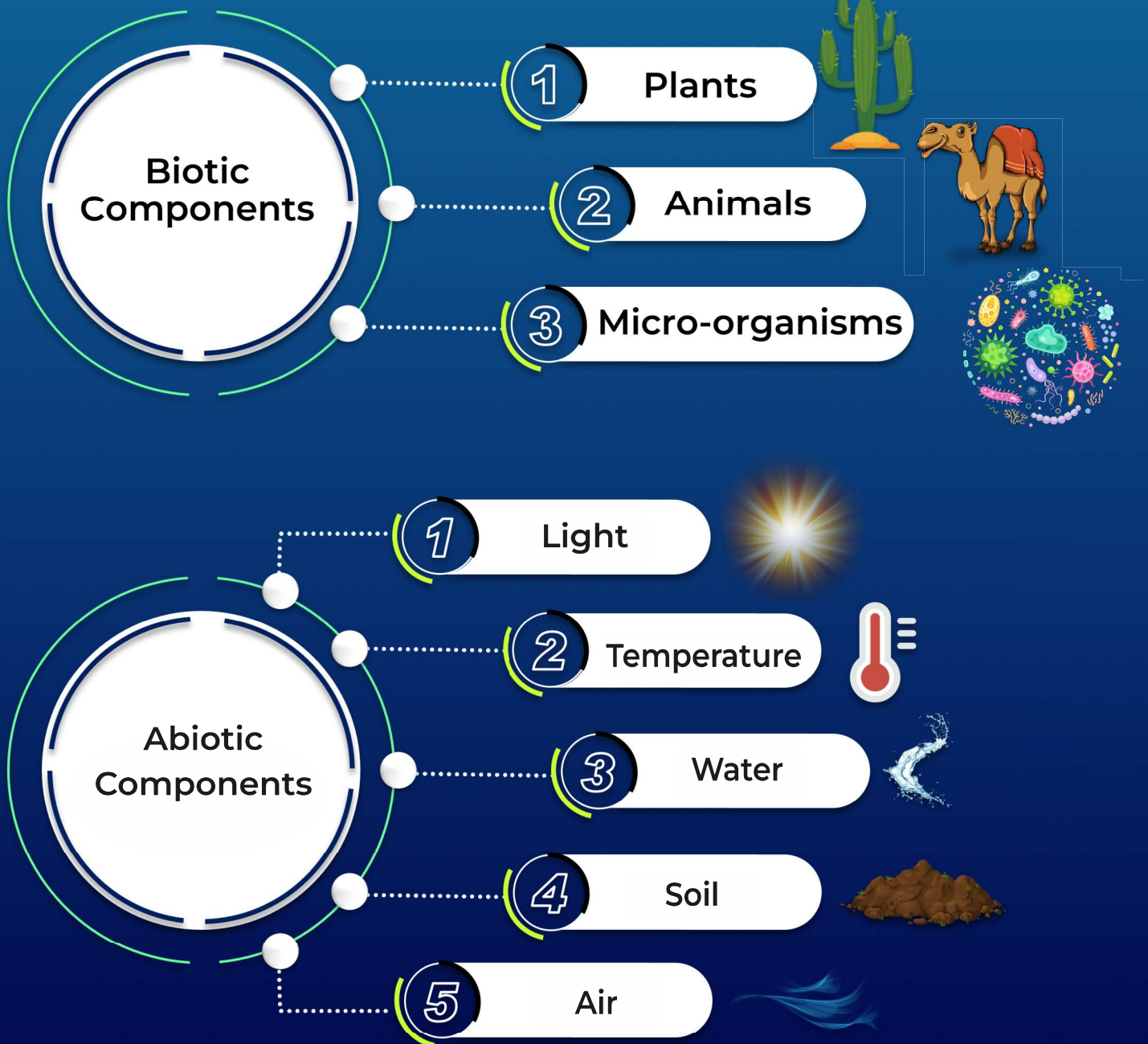
HABITAT

**Abiotic
componets**

**Biotic
componets**

**“Abiotic” means
“non living”.**

**“Biotic” means
“living”.**



Desert

Adaptation in desert animals

- ▶ The animals like desert rats and desert snakes survive in the hot desert having lack of water due to-
- ▶ They live in burrows because it stay cool during the day and hence protect these animals from the sun's heat as well as loss of water from their body.
- ▶ The desert rats and desert snakes come out of the burrows only during cool night in search of food.



CAMELS

- ▶ Padded feet
- ▶ Stores fat in hump.
- ▶ Sweat less.
- ▶ Less water wastage in urine.
- ▶ Long legs.



Adaptation in desert plants



Spines
(modified leaves to
reduce loss of water)

Green stem (stores
water and
carries out
photosynthesis)

- ▶ The desert plants are adapted to survive in hot and dry environments of Desert.
- ▶ The leaves in desert plants are either absent, very small or present in the form of spines so in desert plants photosynthesis is usually carried out by their green stem.



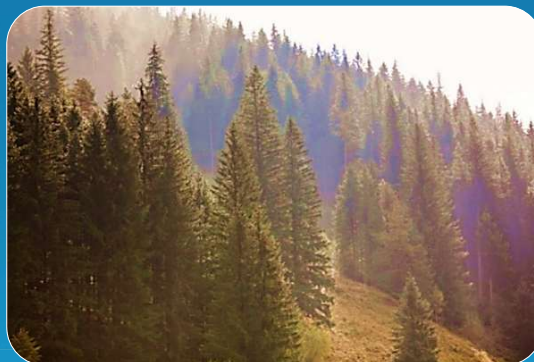
- ▶ The stems of desert plants are modified for storing water. The stems of desert plants are also covered with a thick waxy layer (called cuticle) which prevents the loss of water from it.
- ▶ Most of the desert plants have long roots which go deep into the soil for absorbing water.

Mountain regions

The mountain habitats are usually very cold and windy.

Adaptation in mountainous plants

- ▶ There is lot of rain in mountain regions.
- ▶ It is very cold during winter and snowfall may also occur.
- ▶ The rain and snow may damage the mountain trees and plants.



- ▶ Cone shape of the mountain trees make the rain-water and snow to slide off easily without damaging the branches and leaves.

- ▶ Small, needle-like leaves lose very little water in windy conditions.
- ▶ These leaves have a thick waxy layer to reduce the loss of water through transpiration and to protect them from damage by rain and snow.

Adaptation in mountainous animals

Adaptation in yak :

- ▶ Yaks have long hair on their body to protect them from cold by keeping them warm.



Adaptation in mountain goat:



- ▶ Goat has long hair to protect it from cold and keep it warm.
- ▶ Strong hooves for running up the rocky slopes of mountains for grazing.

Adaptation in snow leopard :

- ▶ The snow leopard is adapted to live in extremely cold places having snow as follows:
- ▶ The snow leopard has thick fur on its body.
- ▶ The fur on its feet and toes which protects its feet from cold when it walks on the snow.



Forests and grass land

Adaptation in Lion :

- ▶ It has long, strong and sharp claws in its front legs to catch its prey. It can withdraw the claws inside the toes so that they do not become worn out and blunt when it walks.
- ▶ The lion has eyes in front of its head which enables it to have a correct idea of the location of its prey.
- ▶ The lion is light brown in colour. The light brown colour helps the lion to hide in dry grassland (without being noticed) when it hunts for prey.



Adaptation in Deer



- ▶ Has eyes on the sides of its head which enables it to see in all directions at the same time. The all round vision of deer helps it to see its predator animals like lion (which kill it), in all the area around it.
- ▶ Has big ears. The big ears help the deer to hear the movements of predators very easily.
- ▶ The deer has brown colour. The brown colour of deer helps it to hide in dry grasslands without being noticed by lion etc.
- ▶ The deer has strong teeth for chewing hard plant stems of the forest.
- ▶ The speed of deer helps it to run away from the predators (like lion) which try to catch it.

Aquatic habitats

Oceans

Many sea-animals have streamlined bodies to help them move in sea water easily.



Ponds, lakes and rivers

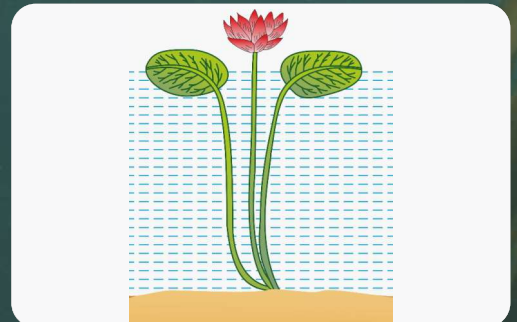
Ponds, lakes and rivers are "fresh-water" aquatic habitats. The plants which grow in water are called aquatic plants.

Floating plant

- ▶ Some aquatic plants float on the surface of water. e.g. water-lettuce and water hyacinth.

Partly submerged

- ▶ Very short and small roots whose main function is to hold the plant in place.
- ▶ Absorb water and dissolved minerals directly from the surface of their stems, branches and leaves.



Completely submerged

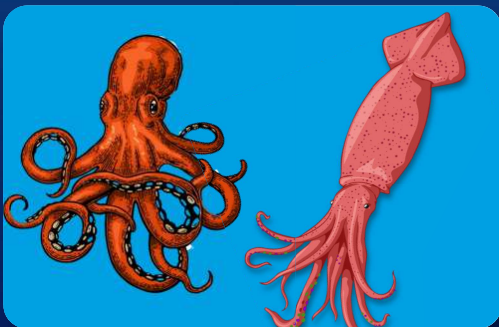
- ▶ Stems plants are soft, hollow and light, having large spaces filled with air.
- ▶ These plants do not need strong stems because the surrounding water of a pond, lake or river keeps them up.

Adaptation in aquatic plants (or water plants) :

- ▶ The aquatic plants have very short and small roots whose main function is to hold the plant in place. All the parts of an aquatic plant are surrounded by water, so an aquatic plant can absorb water and dissolved minerals directly from the surface of their stems, branches and leaves.
- ▶ The stems of aquatic plants are soft, hollow and light, having large spaces filled with air. The aquatic plants do not need strong stems because the surrounding water of a pond, lake or river keeps them up.
- ▶ The submerged aquatic plants have narrow and thin ribbon-like leaves which can bend in the flowing water of rivers and streams and hence do not obstruct the flow of water.

Frog

- ▶ Frogs have webbed back feet which help them to swim in water. This adaptation helps the frogs to live life in water.
- ▶ Frogs have strong back legs for leaping (jumping) and catching their prey. This adaptation helps the frogs to live life on land.



- ▶ Some sea-animals like squids and octopus do not have streamlined body shape.
- ▶ When these animals move in sea-water, they make their body shape streamlined.

Dolphins and whales breathe in air through blowholes when they swim near the surface of water. Dolphins and whales can stay inside water for long time without breathing.

