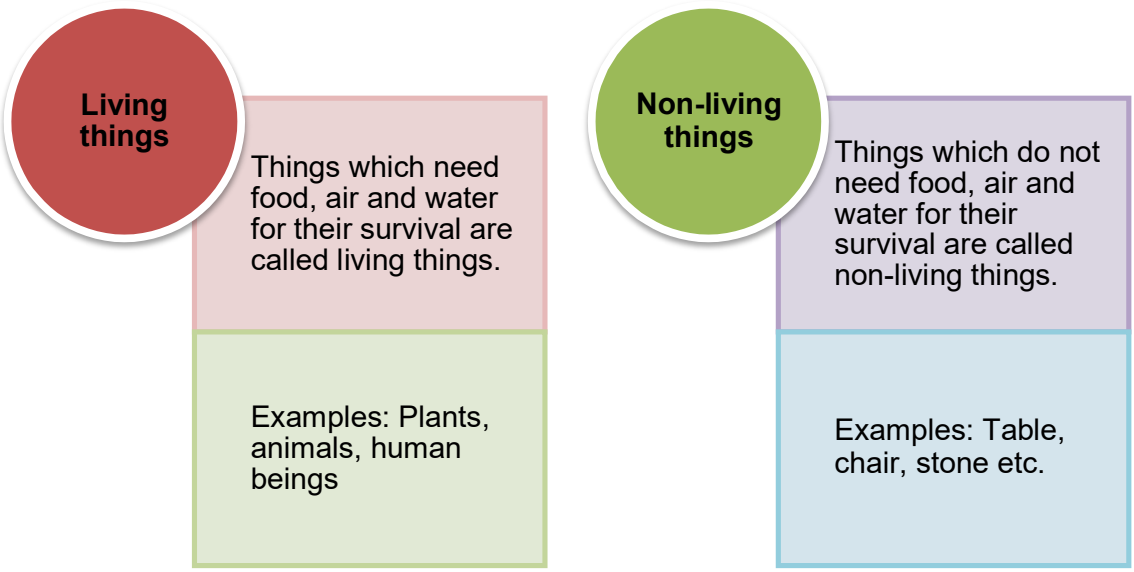
# SCIENCE

# The Living Organisms and their Surroundings

## Living and Non-living Things

- The study of living organisms is called**biology**.




## Habitat and Adaptation

### Habitat

- The place where an organism lives is called its**habitat**.
- Deserts, mountains, forests, grasslands, soil, ponds, lakes and rivers are some examples ofhabitats.
- The habitat provides food, water, air, light, shelter and a place for breeding to plants and animals living init.

## Types of Habitats

**Terrestrial habitat**

- A land-based habitat is calleda terrestrialhabitat.
- Examples: Desert,mountain, grassland, forest

**Aquatic habitat**

A water-based habitat is calledan aquatic habitat.

- Examples: Pond, lake,river, swamp

## Habitats of Some Common Plants and Animals

| PLANTS | HABITAT | ANIMALS | HABITAT |
|---|---|---|---|
| Lotus | Pond | Fish | Pond |
| Cactus | Desert | Camel | Desert |
| Rose | Garden | Tiger | Forest |
| Oak tree | Mountain | Octopus | Sea |
| Coconut tree | Sea shore | Rat | Field |
| *Hydrilla* | Pond | Earthworm | Soil |
| Sunflower | Field | Squirrel | Tree |
| Sea weeds | Sea | Snake | Forest |

## Components of a Habitat

**Biotic components**

- Biotic components are all the living things of a habitat.
- Examples: Plants, animals, microorganisms

**Abiotic components**

- Abiotic components are all the non-living things of a habitat.
- Examples: Sunlight, air, water, soil, wind, temperature,rainfall, light

# Adaptation

- The presence of specific body features which enable a plant or an animal to survive in a particular habitat is called**adaptation**.
- Adaptation is of two kinds - structural adaptation and behaviouraladaptation.
- Structural adaptation refers to changes in the shape and size of the body of ananimal.
  Examples: Ducks have webbed feet which enable them to wade through watereasily.
- Behavioural adaptation refers to changes shown by an animal with respect to its behaviour.
  Examples: Penguins move in large groups to protect themselves frompredators.

## Adaptations in Animals

**Adaptation in camel**

- It lives in the hot desert where water isscarce.
- Long eyelashes, nostrils, ears covered with hair to prevent the sand from entering into their eyes, nose andears.
- Large and flat feet which ensure that the camel can walk easily on thesand.
- Stores fats in its bulky and fatty hump and derives its nutrition using the reserve fat present in thehump.
- Excretes a small quantity of urine after a long period of time to conservewater.
- Drinks bulk of water and stores it in its stomach.

**Adaptation in fish**

- It lives inwater.
- The head, trunk and tail merge to form a streamlinedbody.
- Gills which help to absorb oxygen dissolved in water forbreathing.
- Slippery scales over its body protect the body from water.
- Strong tail forswimming.
- Flat fins to change direction and keep its body balanced inwater.

# Some Terrestrial Habitats

## Deserts

- A waterless area of land covered with sand and with little or no vegetation is called a**desert**.
- It receives very low rainfall. The annual rainfall is less than 250 mm peryear.
- The maximum temperature in deserts ranges between 43.5°C and 49°C. The minimum temperature ranges between 0°C and3°C.

## Adaptations of Organisms Living in Deserts

| **Adaptations in Desert Animals** |
|---|
| • Most of the animals in the deserts remain inactive during the day and arecalled nocturnal.<br>• They live in burrows to escape from intenseheat.<br>• Desert animals need to maintain an optimal bodytemperature.<br>• So, animals such as jack rabbits have developed long ears which provide greater surface area to dissipateheat.<br>• Desert animals such as desert rats and desert snakes pass out verysmall amounts of urine which helps them to conserve water in their body. |
| **Adaptations in desert plants** |
| • Plants growing in hot and dry regions such as deserts are called xerophytes or xerophyticplants.<br>• They have a well-developed root system which spreads deep into the soil. This helps them to absorb water from the deepest soil layerspossible.<br>• In some plants, the surface area of the stem and leaves isreduced.<br>• Some plants shed their leaves under unfavourableconditions.<br>• The leaves are either absent, very small or present in the form of spines. This helps to reduce the loss of water throughtranspiration.<br>• Stem or leaves are covered with a thick waxy layer called cuticle which prevents the loss ofwater.<br>• The leaves of plants possess sunken stomata which are slightly deeper thanthe leaf surface. |
| **Adaptations in Cactus** |
| • The leaves are smaller and fewer innumber.<br>• When water is scarce, the leaves get transformed into fine pointedspines.<br>• The stem is fleshy, thick and green so that it can store food andwater.<br>• The stem is covered with a cuticle to prevent the loss of water through evaporation.<br>• It has long roots to absorb water from a largerarea. |

## Mountain Regions

- A very high hill is called amountain.
- Mountains can be covered withsnow.
- Mountainous habitats are usually very cold andwindy.

## Adaptations of Organisms Living in Mountain Regions

| Adaptations in mountainous plants |
|---|
| • Trees are usually cone-shaped with slopingbranches<br>• Leaves are small, needle-shaped to minimise the loss of water in windy conditions<br>• Broad-leaved trees shed their leaves before the onset of winter to preventthe loss of water from their leaves |
| **Adaptations in mountainous animals** |
| • Thick skin of fur to protect them from the coldenvironment |
| **Adaptations in Yak**<br>• Long hair on its body protects it fromcold |
| **Adaptations in Mountain goat**<br>• Long hair protects the goat from cold and keeps itwarm<br>• Strong hooves help in running up the rocky slopes of mountains forgrazing |
| **Adaptations in Snow leopard**<br>• Thick fur on its body protects it from cold and keeps itwarm<br>• Thick layer of fat beneath its skin provides insulation and protects it fromcold<br>• Rounded body and small ears to minimise the body surfacearea<br>• Big feet to spread the weight on snow and to prevent it from sinking into soft snow |

## Forests

- A large area of land covered mainly with trees and plants is called a**forest**.

## Adaptations of animals living in forests

| Adaptations in lion |
|---|
| • Strong, fast and agile animal which can hunt and kill itsprey<br>• Long, strong and sharp claws on its front legs so it can catch itsprey<br>• Eyes are in front of its head to have an exact idea of the location of itsprey<br>• Its light brown colour helps it to hide in dry grasslands when it hunts itsprey |
| **Adaptations in deer** |
| • Eyes on the sides of its head enable vision in all directions at the sametime<br>• Big ears help the deer to hear the movements of predators veryeasily<br>• High speed enables it to escape from itsenemies<br>• Brown colour helps it to camouflage itself in dry grasslands without being noticed by itspredators<br>• Strong teeth for chewing hard stems of forestplants |

# Some Aquatic Habitats

## Oceans

- A very large area of sea is called an**ocean**.

**Adaptations in animals living in oceans**

- Streamlinedbodies.
- Gills forbreathing.
- Blowholes in case of Dolphins and whales forbreathing.

## Ponds, Lakes and Rivers

- Small water bodies are referred to as ponds, lakes andrivers.

**Floating plants:**

- Some aquatic plants float on the surface ofwater. They are called floating plants.
- Examples: Water lettuce, waterhyacinth

**Partly submerged plants:**

- Some aquatic plants are partly submerged in water.
- The stems of such plants grows upto the surface of water while the leaves and flowers float on the watersurface.
- Examples: Water lily,lotus

**Completely submergedplants:**

- Some aquatic plants are completely submerged inwater.
- All plant parts such as stem, branches and leaves grow underwater.
- Examples: *Hydrilla*,*Vallisneria*

| **Adaptations in aquatic plants** |
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| • They have very short and smallroots.<br>• They have soft, hollow and light stems with large spaces filled with air. This helps them to stay afloat inwater.<br>• 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 ofwater.<br>• The thin leaves also allow minerals to pass through the plantseasily.<br>• The leaves are broad butflexible. |
| **Adaptations in animals to live in water and on land** |
| • Frogs have webbed feet which help them to swim and survive inwater.<br>• They have strong hind legs for hopping and catching their prey. This helps them to survive onland. |

- The process of being accustomed to a different environment over short periods of time is called acclimatisation.