



Fig 3.1 Vegetables

Mani and Mythli are helping their mother in the kitchen.

Mother : Children, will you help me to make a fresh vegetable salad?

Mani : Sure Amma. We will be glad to help you.

Mother : Choose some vegetables that you want from the basket.

Mani and Mythli selected tomato, spinach, cabbage, groundnut, cucumber, green peas, carrot and beetroot.

Shall we classify them.

Roots	Leaves	Fruits	Seeds

The Children made a tasty salad with the different parts of the plant.



3.1. CHARACTERISTICS OF LIVING THINGS

Things that have life are called living things.

eg. Plants and animals.

Things that do not have life are called non-living things.

eg. Rock, book.

Among living things, some are plants and some are animals. Now the question is, how do living things differ from non-living things?

Living things show the following characteristics, whereas non-living things do not.

All living things

- ☛ need food,
- ☛ respire to convert food into energy.
- ☛ grow at certain stages of life.
- ☛ respond to their surroundings.
- ☛ live for a definite span of time.
- ☛ reproduce their own kind.
- ☛ are made up of cells.

32. HABITAT - VARIOUS HABITATS OF PLANTS

Children, shall we go for a walk around our school and make a list of different plants and animals there. We see different varieties of plants around us. All plants are well adjusted to the place where they live. The living place of a plant provides food, shelter and suitable climate to survive and reproduce successfully. Such a place

of living is called a habitat. In nature, plants live in different habitats such as water, land, desert, hills and so on.

WARMING (1909) classified the plants into three types on the basis of their water requirement. They are

1. Hydrophytes.
2. Mesophytes.
3. Xerophytes.

1. Hydrophytes

Hydrophytes means water plants (Hydro = Water, and Phytes = Plants).

These plants live in the water of ponds, lakes and rivers. Plants which live in water are called hydrophytes. They are divided into three types:

a) Free-floating hydrophytes

These plants float freely on the water surface.

eg. Water hyacinth (Agayatamarai)



Fig 3.2 Water hyacinth (Agayatamarai)

b) Attached floating hydrophytes

These plants are fixed at the bottom of the pond and the leaves float on the surface of the water.

eg. **Water- lily (alli).**



Fig 3.3 Water- lily

c) Submerged hydrophytes

These plants are rooted in the mud and remain under- water.

eg. **Vallisneria**

Adaptations of Hydrophytes

1. Root system is poorly developed. In some cases roots are even absent.
2. Stem is thick, short and spongy with air spaces to float in water.



Fig 3.4 Vallisneria

3. Leaves have a waxy-coat that prevents their decay in excess water.

2. Mesophytes

These plants grow in places with moderate water supply. They cannot grow in places with too much of water or too little water. Most of the crop plants are mesophytes.

eg. **Wheat, maize, sunflower, mango, neem.**



Fig 3.5 Sunflower (Surya kanthi)

Adaptations of mesophytes

1. They have well developed root system.
2. Leaves are usually large and broad.

3. Xerophytes

Xerophytes means desert plants:

(Xero = Desert and Phytes = Plants)

Plants which grow in dry areas (deserts) are called Xerophytes. The plant body is adapted to cope with the water scarcity, high temperature, strong winds, etc.

eg. **Opuntia (chappathikalli).**



Fig 3.6. Opuntia (chappathikalli)

ADAPTATIONS OF XEROPHYTES:

1. They have long roots which go deep into the ground so as to absorb water.
2. In Opuntia, the stem is thick, flat and green, and does the function of photosynthesis.
3. Leaves are reduced or modified into spines to prevent the loss of water from their surface.

3.3. HERBS, SHRUBS AND TREES



“Valli... the walk around the campus was very interesting wasn't it?”

“Yes Selva, did you notice that all plants are not of the same size.”

“You are correct valli.”

Flowering plants can be grouped based on their size of stem.

They are herbs, shrubs and trees.

1. Herbs

- Small plants with soft and green stem are called herbs.
- They are non-woody plants



Fig 3.7 Paddy

and do not grow more than one metre in height.

eg. **Radish, wheat, paddy, sunflower.**

2. Shrubs

- The medium sized plants with a thin but hard and woody stem are called shrubs.
- They do not have a clear main stem.
- They tend to branch and become bushy.

eg. **Rose, jasmine, croton, Tulsi, lemon.**

3. Trees

- ☛ Tall and big plants with a distinct hard and woody stem are called trees.
- ☛ The main stem is called trunk which gives out branches and leaves.

eg. **Neem, mango, teak, coconut, banyan.**



Fig 3.8 Mango tree

3.4. PARTS OF A PLANT

Shall we recollect the salad that Mani and Mythili made. It was made with different parts of the plant.

A typical flowering plant consists of two main systems, viz. Root System (underground part), and Shoot System (aerial part). The root System consists of main root and its lateral branches. The Shoot System has a stem, branches and leaves. The flowering plant produces flowers, fruits and seeds at maturity. Root, stem and leaves are called vegetative parts of a plant as they do not take part in reproduction. Flowers, fruits and

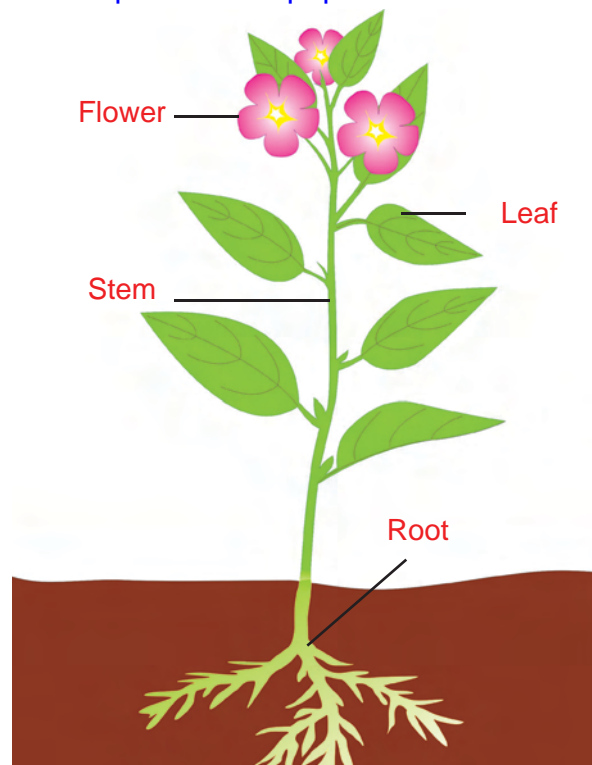


Fig 3.9 Parts of a plant

seeds are reproductive parts of a plant as they take part in reproduction.

3.4.1. ROOTS, STEM, LEAVES AND FLOWERS

Root system

The part of the plant which grows under the soil is called Root System. It usually develops from the radicle of embryo. It is the descending part of the plant. It grows away from sunlight. It does not have chlorophyll. Nodes and Inter-nodes are absent. It does not bear leaves or buds. Root system is broadly classified in two types. They are

1. Tap root system
2. Adventitious root system

ACTIVITY 3.1

Let us take a jar and fill it with water. Place an onion in the neck of the jar and its base in the water. Observe the onion roots.



1. Tap Root System

The radicle of the embryo grows deep into the soil and becomes the primary root (tap root). This root gives rise to lateral roots such as secondary roots and tertiary roots. Generally dicot plants have tap root system.

eg. Mango, neem, carrot, radish, etc.

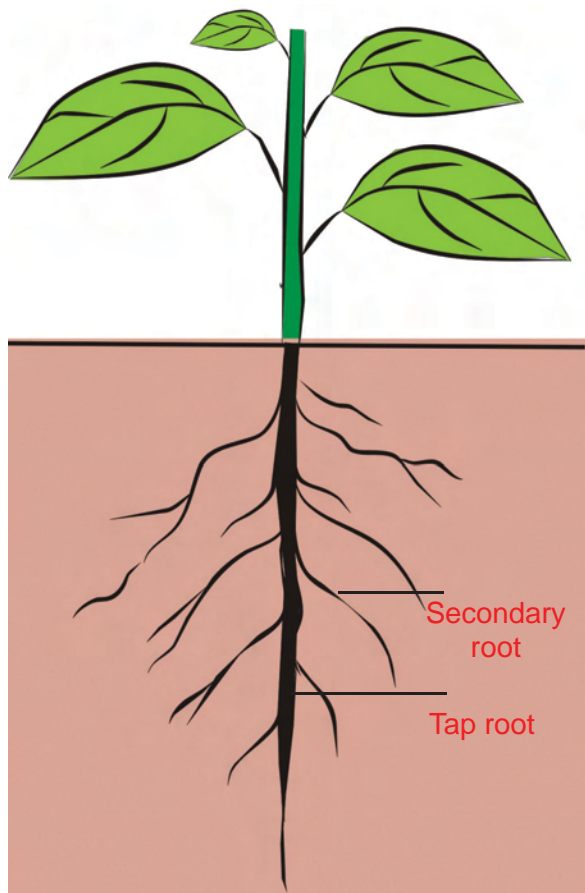


Fig 3.10 Tap Root

2. Adventitious Root System

Roots that grow from any part of the plant other than the radicle are called adventitious roots. These roots arise in cluster which are thin and uniform in size. As these roots arise in cluster, they are also called as fibrous roots. Most monocot plants show adventitious roots.

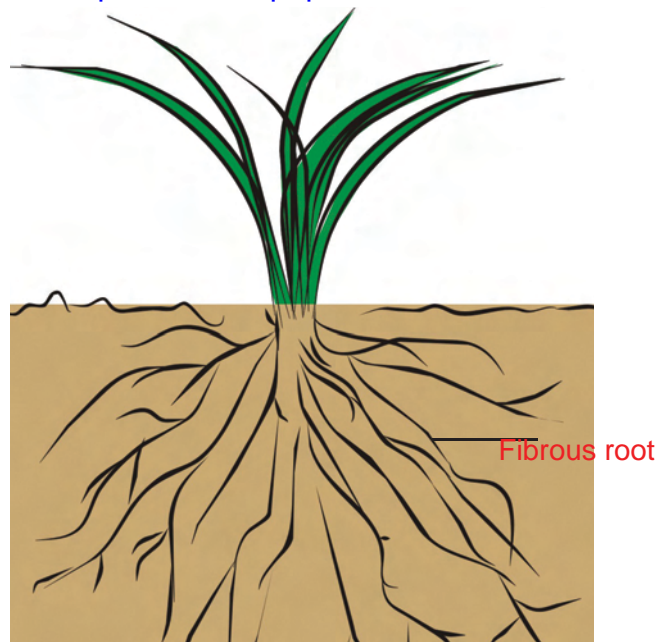


Fig 3.11 Adventitious Root

eg. Rice, grass, maize, bamboo.

Normal functions of roots

1. Roots absorb water and minerals from the soil and transport to the stem.
2. Roots fix the plant firmly to the soil.

Shoot system

The part of the plant which grows above the ground is called shoot system. It develops from the plumule of the embryo. Stem is the ascending part of the plant axis. It grows towards the sunlight. The shoot consists of main stem with a branches, nodes, inter-nodes, leaves, buds, flowers and fruits. Young stems are green and old stems are brown in colour. The place from where the leaf arises is known as node. The distance between the two successive nodes is called inter-node. It bears buds either in the axils of leaves or at the tip of the stem.

Normal functions of stem

1. Support: The stem holds the branches, leaves, flowers and fruits.

2. Conduction: The stem transports water and minerals from roots to the upper parts. It also transports the prepared food from leaves to other parts.

ACTIVITY 3.2

Children, it is very interesting to help our mother in the kitchen, and next time you clean greens (Keerai), try to observe the various parts of the plant.

Leaf

Leaf is thin, broad, flat and green part of the plant. The leaf consists of three main parts. They are leaf blade (leaf lamina), Leaf stalk (Petiole) and Leaf base.

Leaf blade (leaf lamina):

It is the expanded part of the leaf which is green in colour. It has a midrib (a main vein), in the centre of the leaf blade. The midrib has branches on either side which are called veins.

Petiole

The stalk of the leaf is called petiole. It connects the lamina to the stem.

Leaf base

The basal part of the leaf with which it is attached to the stem is called leaf base. The leaf base may bear two small lateral leaf-like structures called stipules.

Normal functions of leaf

1. Synthesis of Food: Leaves produce food by photosynthesis.

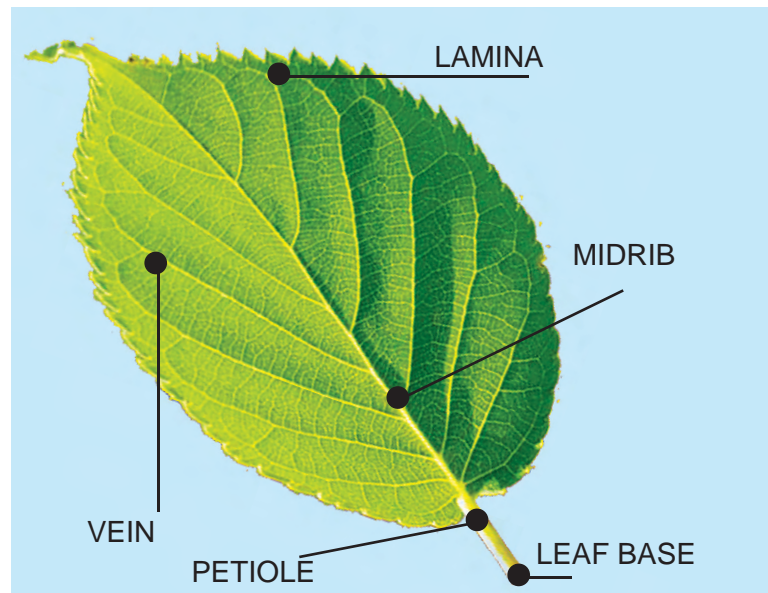


Fig 3.12. Leaf

2. Exchange of Gases: Leaves exchange gases through stomata. Plants take in carbon dioxide and give out oxygen during photosynthesis. They take in oxygen and give out carbon dioxide during respiration. This is called exchange of gases in plants.

3. Transpiration: The loss of excess water from the leaf in the form of water vapour through stomata is called transpiration.



Fig 3.13 Transpiration

ACTIVITY 3.3

Let us cover a leaf of a potted plant with a transparent polythene bag. Observe it after few hours. We will find water droplets in the polythene bag. This proves transpiration in leaves.

Flower

Flower is called the reproductive part of a plant because it helps in sexual reproduction. The flower changes into fruit after pollination and fertilization. Like leaves, flowers also have stalk. The stalk of a flower is called pedicel. There are stalk less flowers also.

eg. **Banana.**

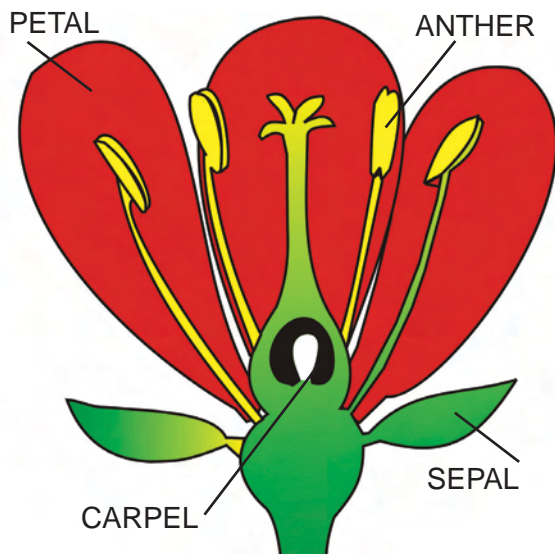
Parts of a typical flower

Fig 3.14 Parts of a flower

A flower has four parts, viz. Calyx, Corolla, Androecium and Gynoecium.

Calyx: The green, leaf like parts in the outermost circle of a flower are called sepals. They protect the flower when it is a bud.

Corolla: The brightly coloured parts of a flower are called Petals. They are the second part of the flower.

They can be of different colours, shapes and sizes.

Androecium: The stamen is the third part of a flower. It is the male part of the flower. Each stamen consists of a stalk called filament and a bag like structure on the top of filament called anther. Anther forms pollen grains which are the male gametes.

Gynoecium: It is the inner most part of the flower. It is the female part of a flower. A carpel has three parts. The upper part of the carpel is the stigma. The middle part is called style. The lower swollen part is called ovary. Ovary contains ovule which has the egg (female gamete).

Function of a Flower

1. Reproduction: It is the organ of reproduction in plants and grows into fruits and seeds.

2. Perfume: It is extracted from some flowers.



Fig 3.15 Kurinji