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Parts of a plant , The root system and shoot system , types of roots , functions of roots and stem Period 1

SUBJECT : (Science)
CHAPTER NUMBER: 1
CHAPTER NAME : The Leaf

ROOT SYSTEM AND SHOOT SYSTEM

- A plant can be broadly divided into two systems- **the root system and the shoot system.**
- The part of the plant that remains in the soil is called the **root system .**
- The part of the plant that grows above the soil forms the **shoot system.**
- It consists of the **stem, branches, leaves, buds ,flowers and fruits.**

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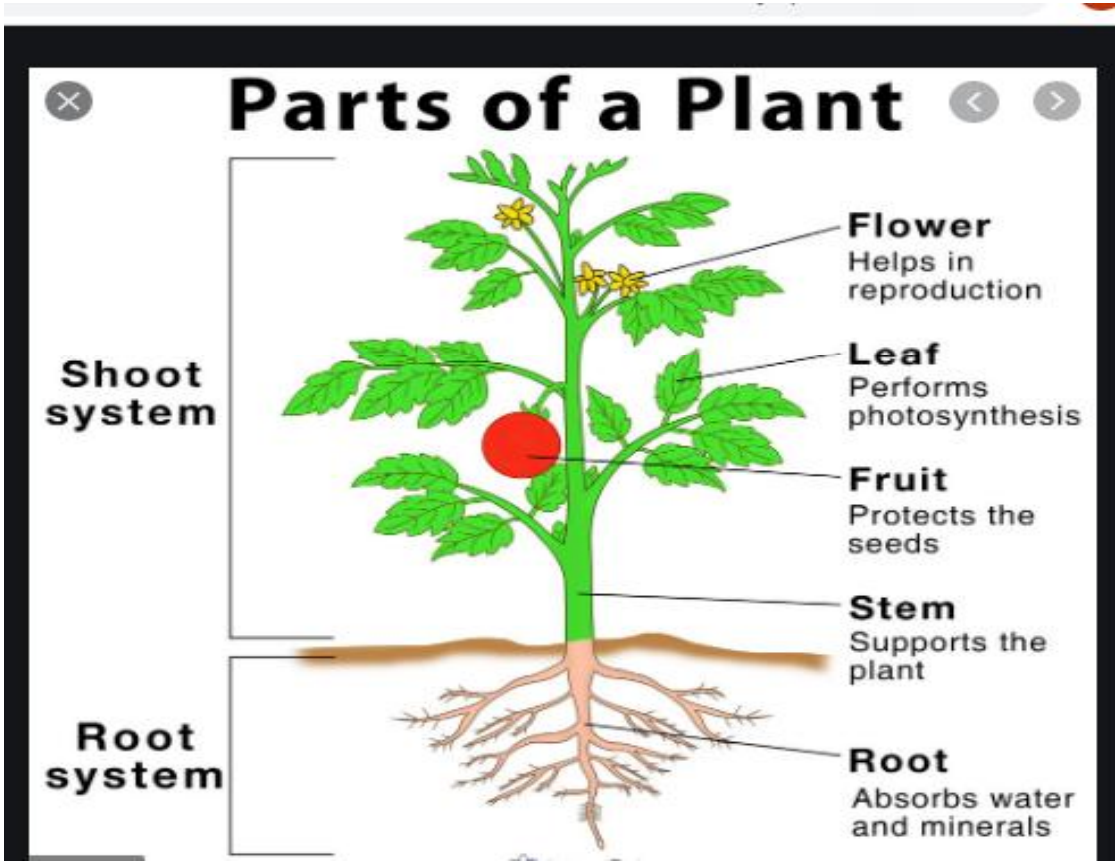
ROOT SYSTEM AND SHOOT SYSTEM



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- **Roots , stems and leaves** are the vegetative parts of the plant.
- **Flowers , fruits and seeds** are the reproductive parts of the plant.

Characteristics of roots

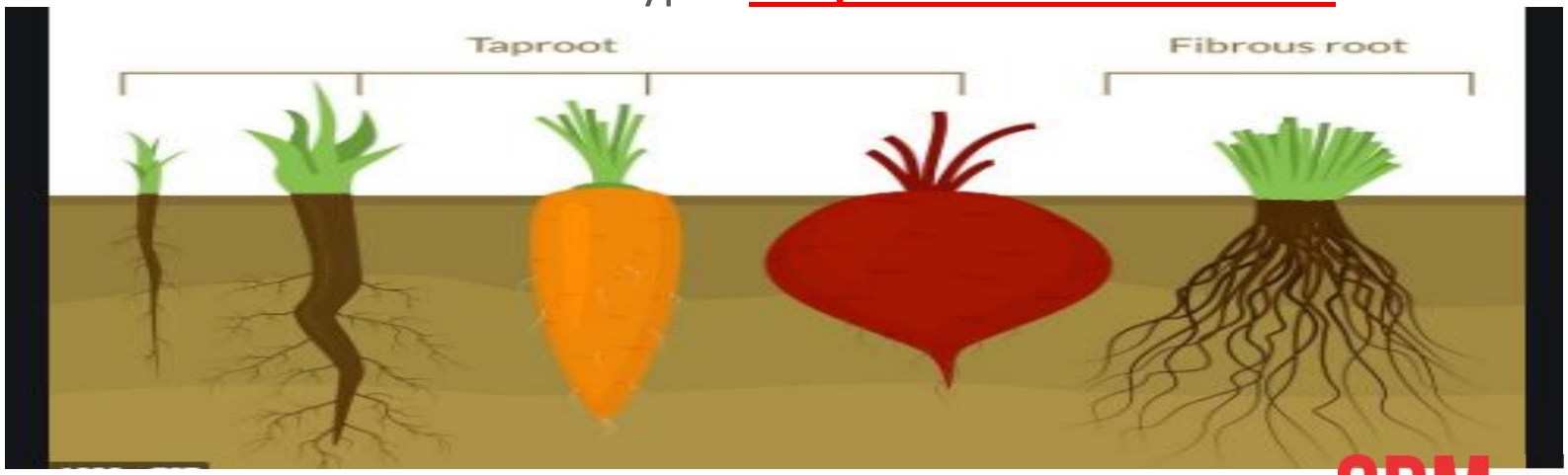
- It is the part that usually grows below the ground.
- It always grow towards moisture and gravity , and grow away from light.
- They do not have seeds , flowers or fruits .

THE ROOT SYSTEM

- **The root** is a part of a plant that attaches it to the soil for support.

Mostly it grows **under the soil .**

- Roots are of two types **- taproot and fibrous root.**



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TAP ROOT

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TAP ROOT

- **In a tap root,** a single, thick main road grows from the base of the stem.
- This root is generally **broad** at the top and tapers gradually to become **narrow** at the bottom .
- Smaller branch roots, called **lateral roots,** grow from the **main root.**
- Plants **with tap roots include** carrot, beetroot turnip, mango, neem, mustard sunflower, rose and tulsi.

FIBROUS ROOT

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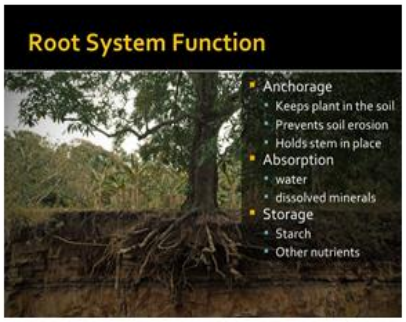
FIBROUS ROOT

- **In a fibrous root**, a number of thin, hair- like roots grow from the base of the stem.
- There is **no main root.**
- This type of root appears as a **cluster of fibres.**
- Plants such as **grass, maize, wheat, rice, sugarcane and onion have fibrous roots**

FUNCTIONS OF THE ROOT

The basic functions of the roots are as follows .

- **Anchorage of the plant .**
- **Absorption of water and minerals .**
- **Prevention of soil erosion**



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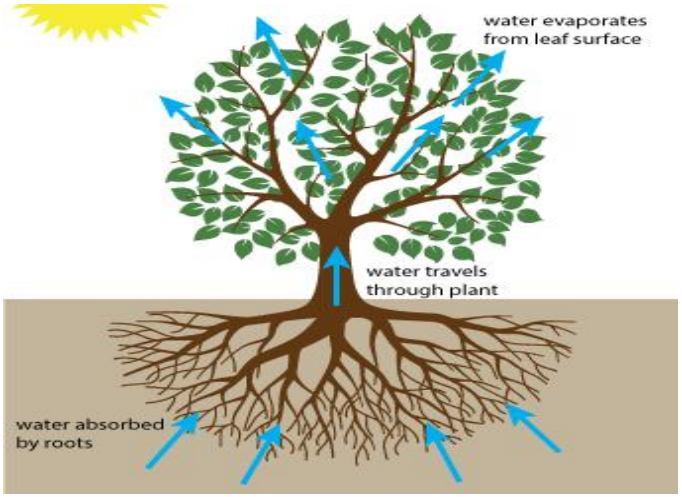
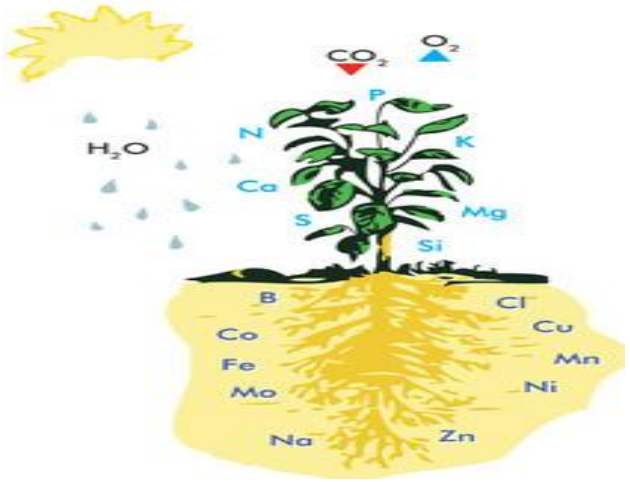
ANCHORAGE OF THE PLANT

The root of a plant anchors it or fixes it to the soil .
It enables the plant to stay firmly attached to the soil.

ABSORPTION OF WATER AND MINERALS

- The root **absorbs** water and minerals from the soil.
- These are then drawn upwards by the **shoot system**.
- Water is essential for **photosynthesis**.
- Minerals help in the proper **growth and development** of the plant.





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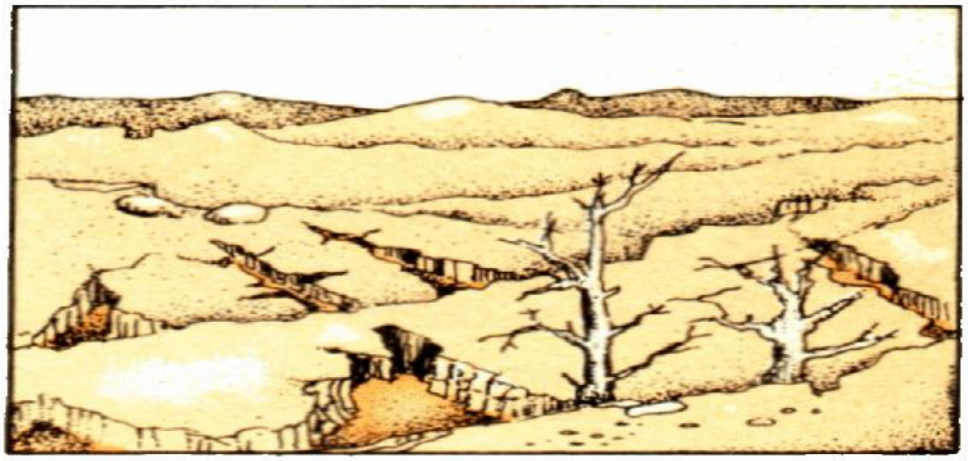
PREVENTION OF SOIL EROSION

The roots of a **plant bind** the soil particles together ,thus preventing the top layer of the soil from being blown or washed away.



Loss of plant cover leads to soil erosion.

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Period 2

Subtopic: The leaf - Structure of a leaf , Types of leaves- simple and compound , Arrangement of leaves

SUBJECT : (Science)
CHAPTER NUMBER: 1
CHAPTER NAME : Getting to know plants

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Email: info@odmps.org
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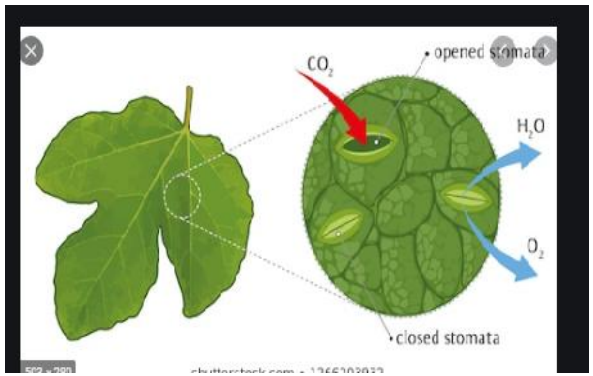
THE LEAF

- **The leaf** is a thin, flattened, green part of a plant that is a attached to the stem or branch at a **node.**

- Leaves contain tiny openings called **stomata,** through which exchange of gases, such as **carbon dioxide, oxygen** and **water vapour** takes place.



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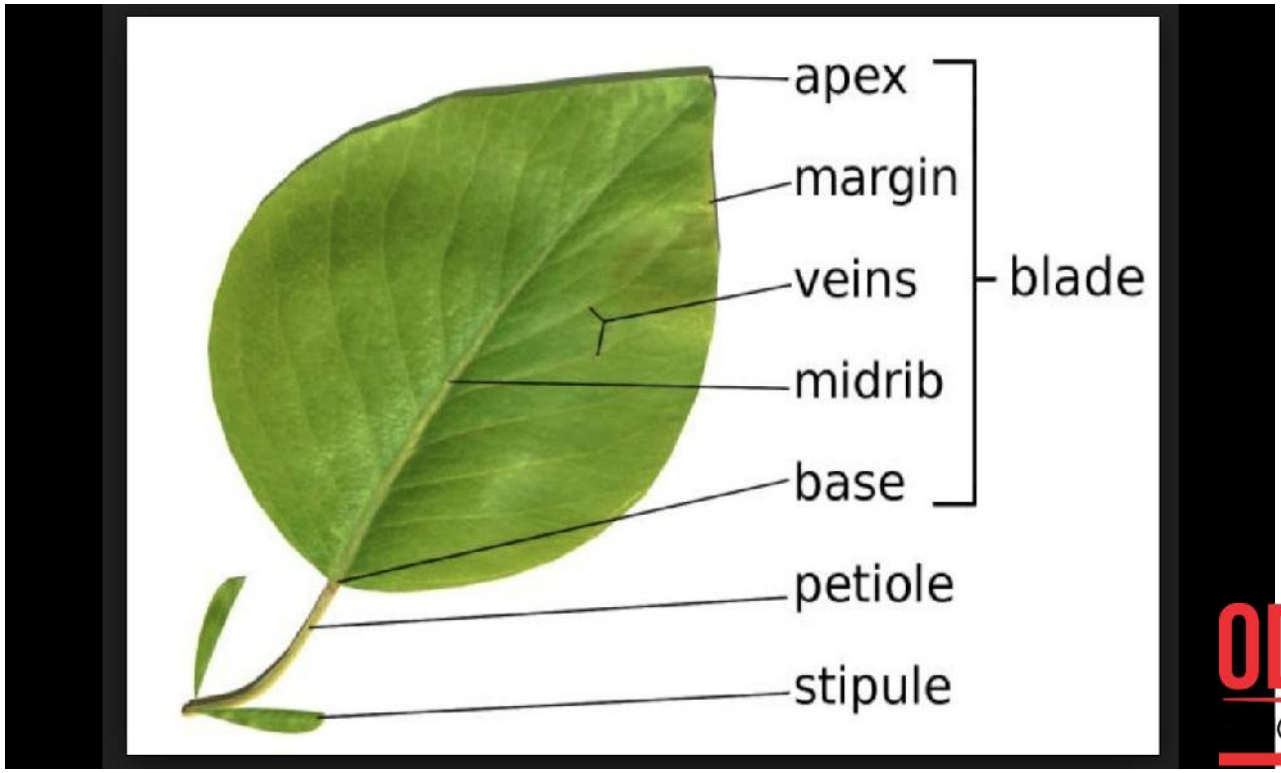
PARTS OF A LEAF



PARTS OF A LEAF

- The leaf has different parts - **lamina, petiole, apex, margin, midrib and veins.**
- The flat, broad and green portion of the leaf is called leaf blade or **lamina**.
- The tip of the leaf is called **apex.**
- The edge or boundary of the leaf is called **leaf margin.**
- The fine lines which spread across the lamina are the **veins.**
- The **midrib** is the main vein which continues from the petiole and runs from the base of the leaf to the apex.
- **Stipule** is the leafy outgrowth at the base of some leaves or its stalk , usually occurring in pairs and soon shed.

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Types of leaf

A simple leaf consists of a single lamina, which is not divided into segments . E.g mango, guava etc.

A compound leaf is one in which lamina is divided into several small leaflets , each attached to the same petiole.

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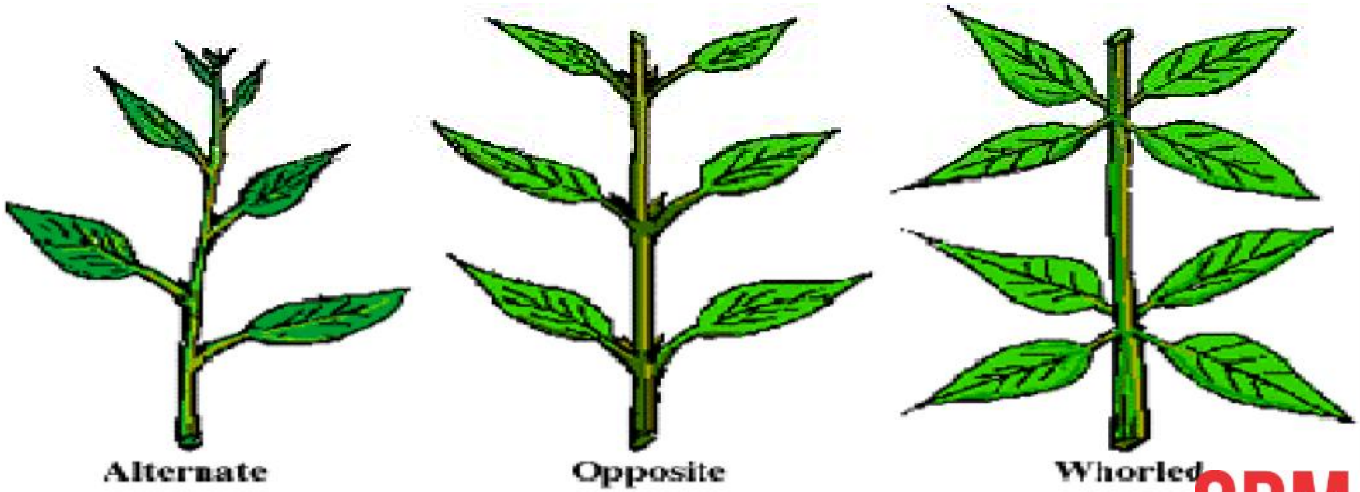
- **Arrangement of leaves**

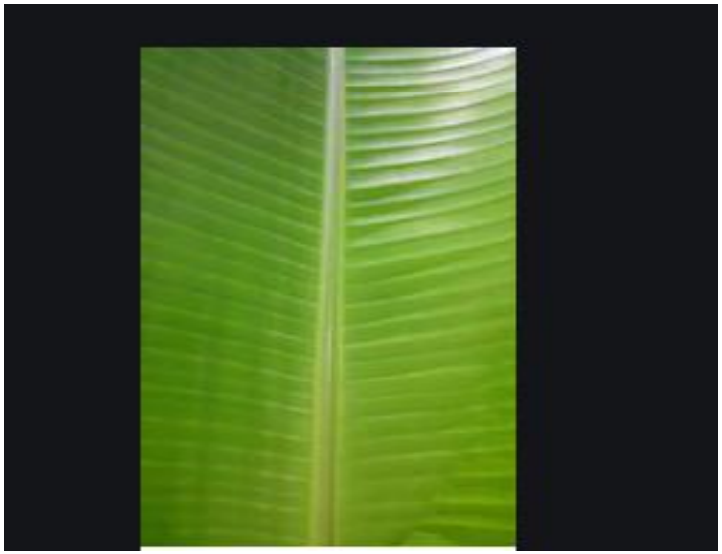


VENATION

- The arrangement of veins in a leaf is called **venation.**
- There are two types of venation- **parallel venation and reticulate venation.**
- **In parallel venation**, **all the veins run para**llel to each other from the base to the apex of the leaf.
- **In reticulate venation**, veins are arranged in the form of **a net- like pattern on the leaf .**

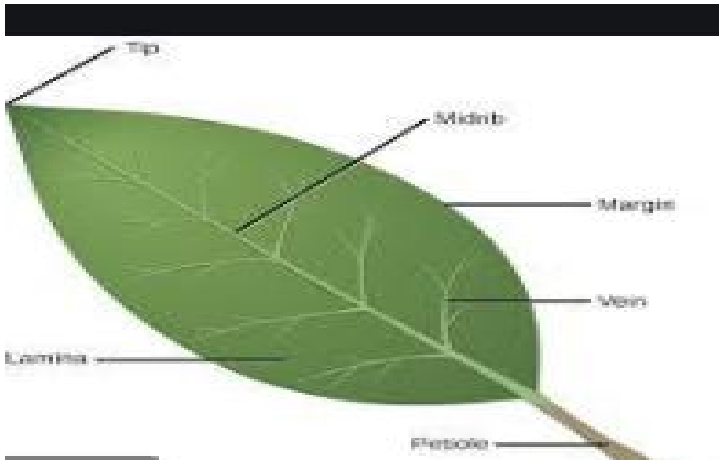
PARALLEL VENATION

- **Parallel venation** is seen in plants such as rice, wheat, bamboo, sugarcane and onion.
- In general, plants with **parallel venation** have **fibrous roots.**

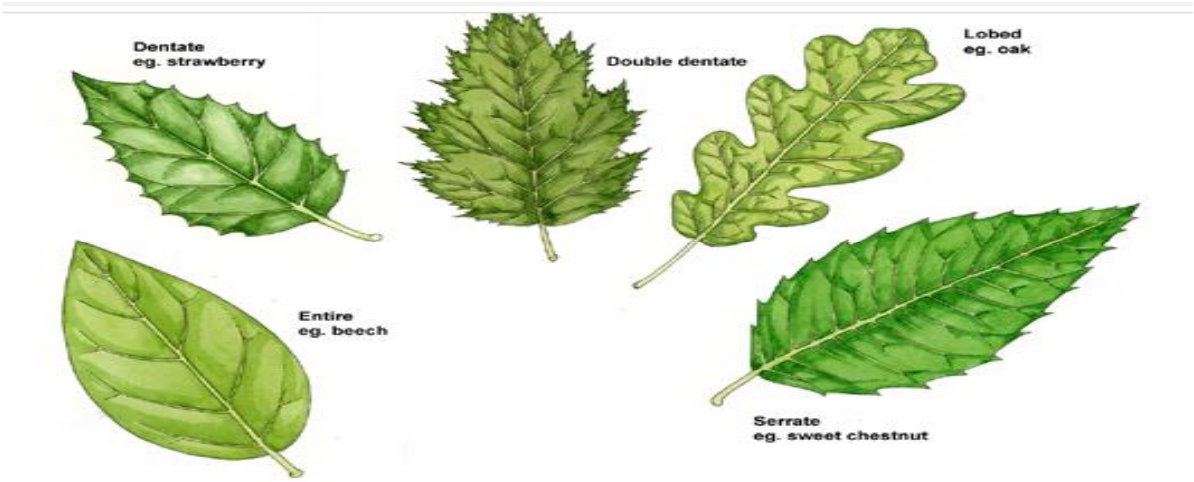


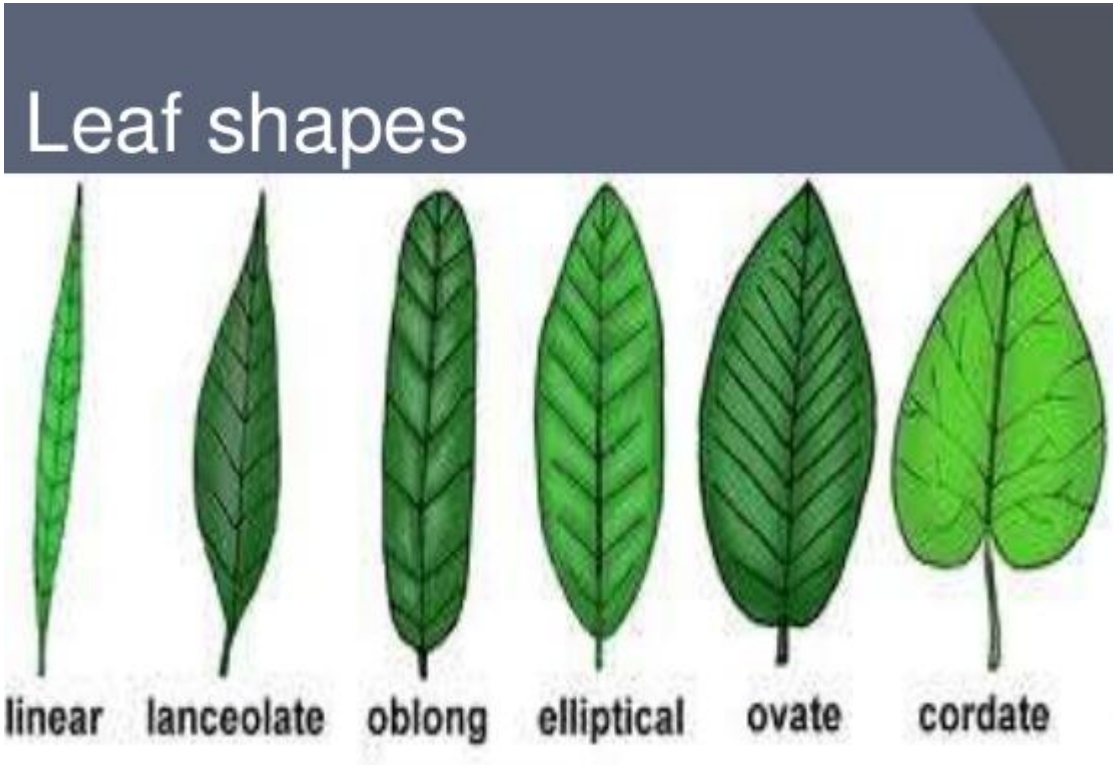
RETICULATE VENATION

- **Reticulate venation** is seen in plants such as rose, peepal, mango neem and Hibiscus.
- Plants with **reticulate venation** have **tap roots.**



Classification of leaves on the basis of margin





Classification of leaves on the basis of shapes

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Period 3

Subtopic: Venation and Functions of Leaf

SUBJECT : (Science)
CHAPTER NUMBER: 1
CHAPTER NAME : Getting to know plants

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VENATION

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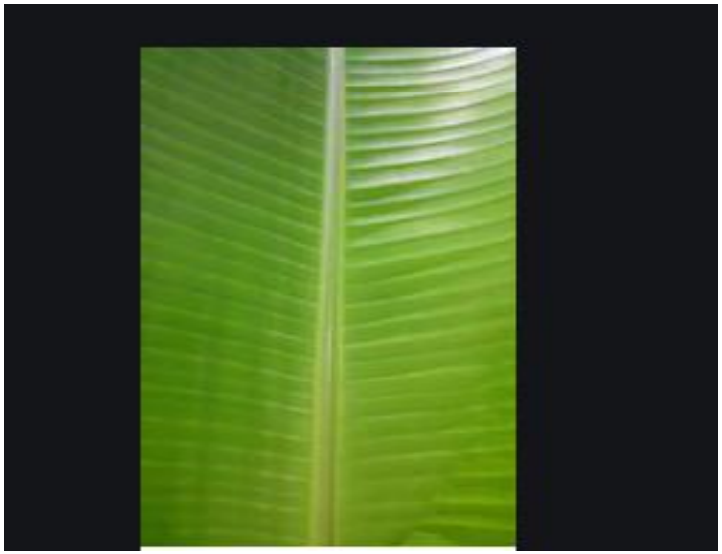
PARALLEL VENATION

- **Parallel venation** is seen in plants such as rice, wheat, bamboo, sugarcane and onion.
- In general, plants with **parallel venation** have **fibrous roots.**



RETICULATE VENATION

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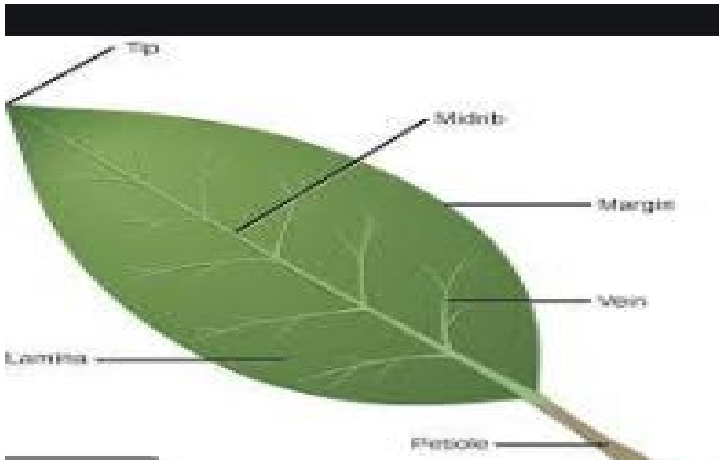
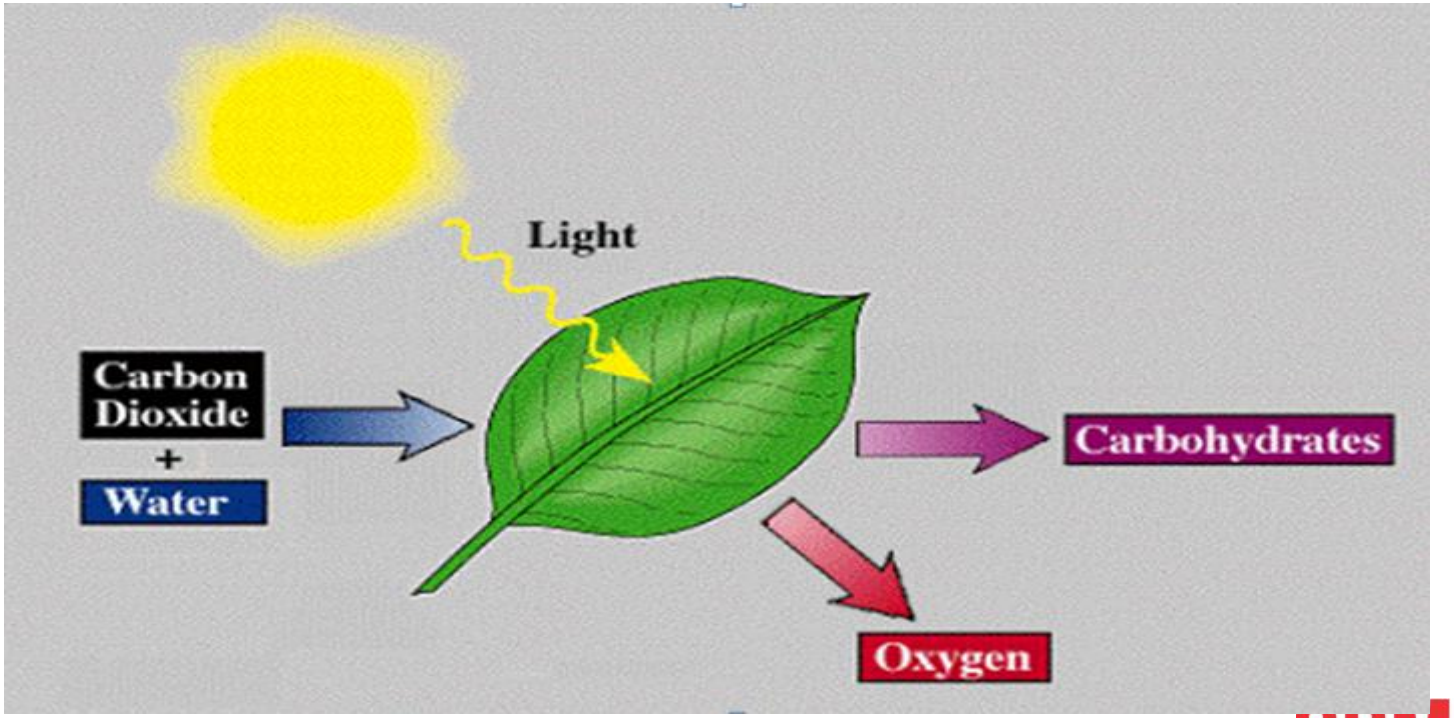
- Plants with **reticulate venation** have **tap roots.**



PHOTOSYNTHESIS REACTION



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FUNCTIONS OF THE LEAF

- **Leaves of plants perform these functions.**
- 1. **Leaves make food for the plant by photosynthesis**. The green pigment chlorophyll present in the leaves traps sunlight for photosynthesis reaction to take place.
- The food is in the form of glucose(a type of sugar).
- This glucose is used by the plant for obtaining energy.
- The extra glucose is converted to starch and it stored in fruit, stems and roots.
- **2. Plants breathe through their leaves with the help of stomata.**
- **3. Leaves of the plant lose water in the form of water vapour through stomata.**
- The process of water movement through a plant and its evaporation from aerial parts in the
- form of water vapour is called transpiration.

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Period 4

Subtopic: Photosynthesis, Transpiration and their significance

SUBJECT : (Science)
CHAPTER NUMBER: 1
CHAPTER NAME : Getting to know plants

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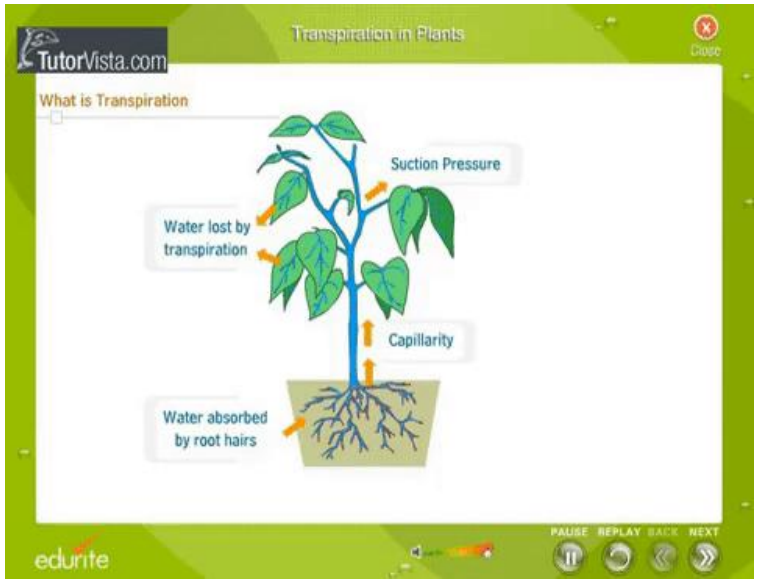
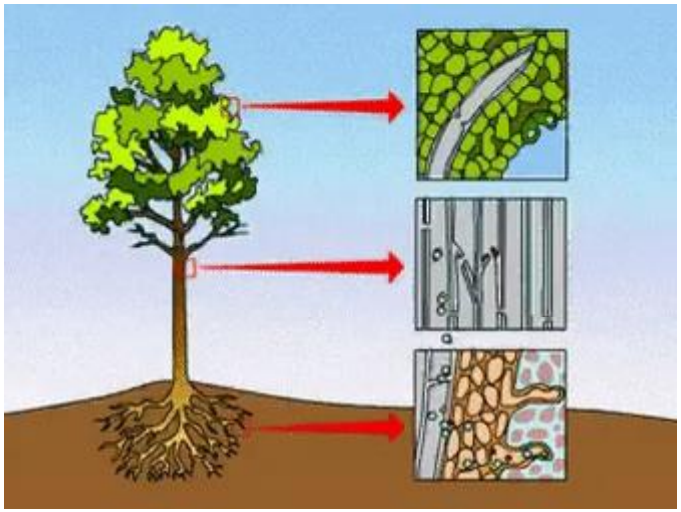
Transpiration is an essential process of eliminating the excess amount of water from the **plant's** aerial parts





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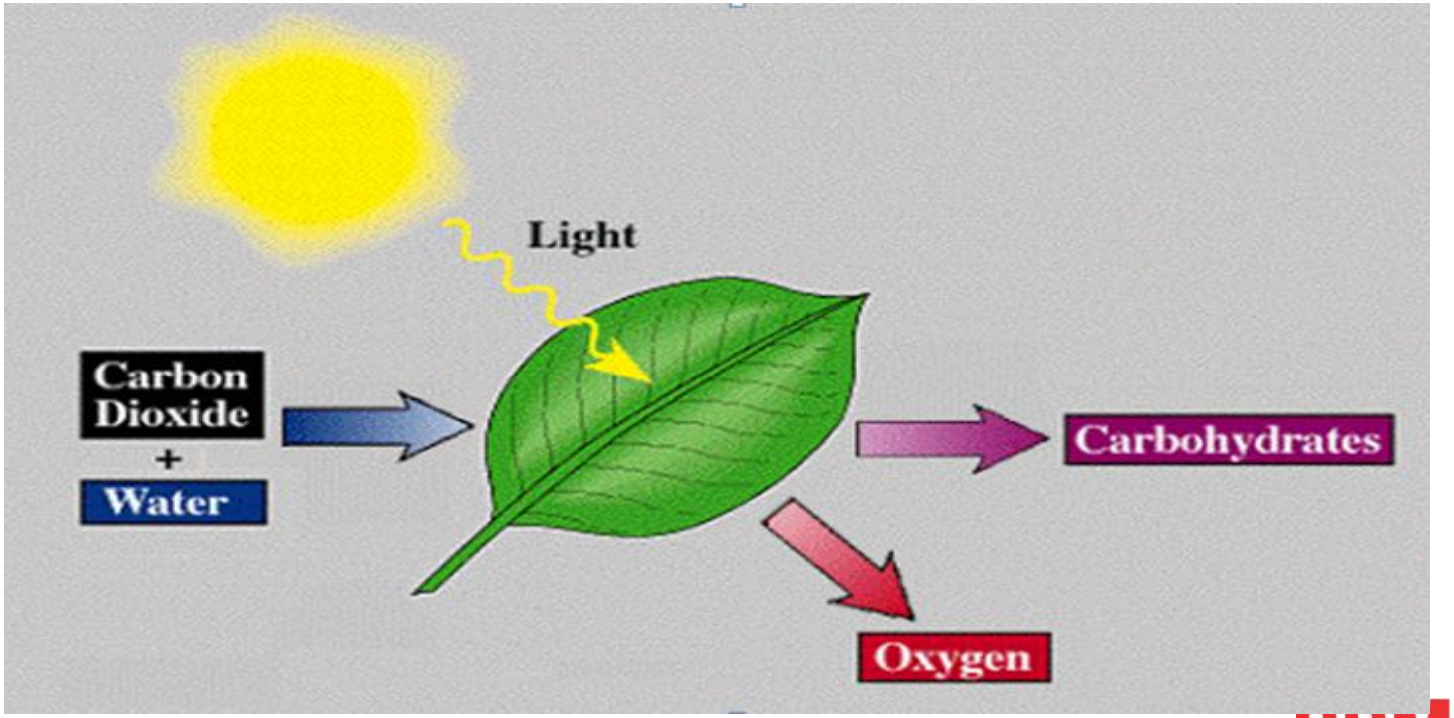
PHOTOSYNTHESIS REACTION



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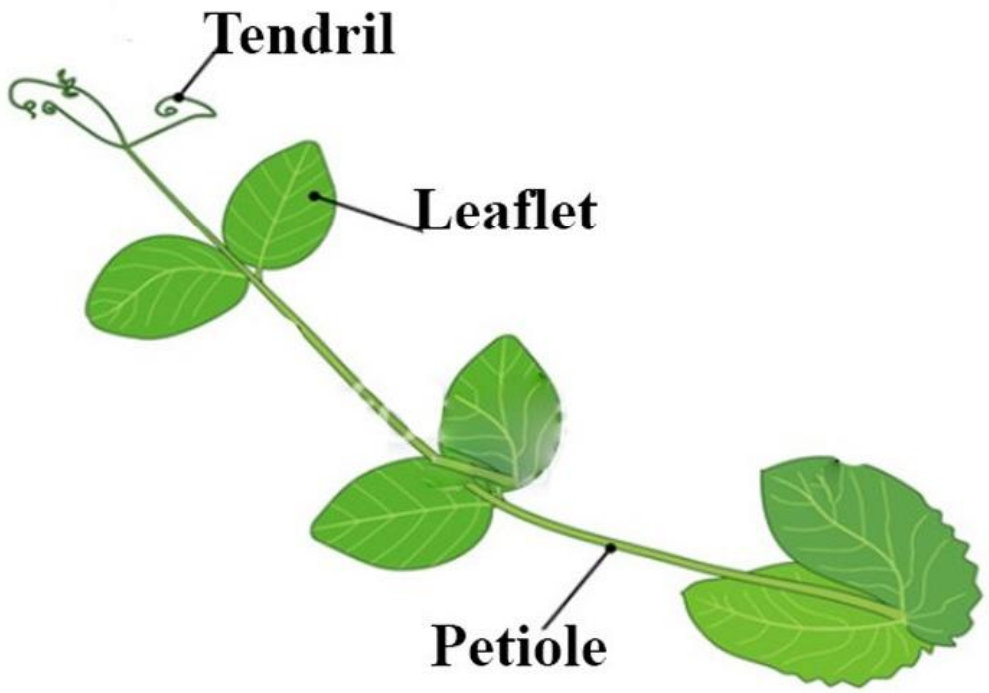
Period 5

Subtopic: Modification of leaf and their significance

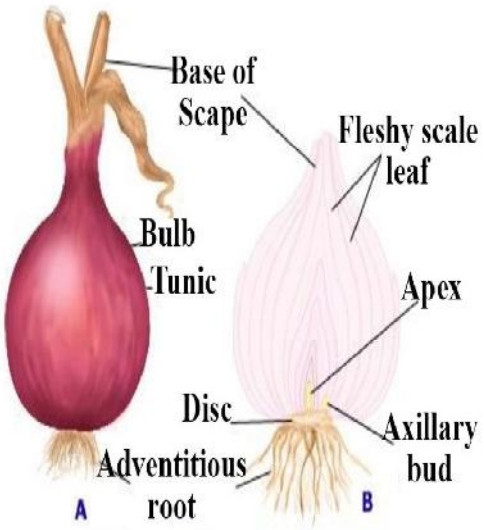
SUBJECT : (Science)
CHAPTER NUMBER: 1
CHAPTER NAME :The Leaf

Leaf Tendril : In case of certainly weak stemmed plants , leaves or leaflets are early plaa modified wiry, coiled structures called tendrils . They are sensitive to touch. As they touch any object they coil around it and support the plant to climb up. Example : sweet pea



Spines :Leaves are modified into spines to reduce water loss like cactus .In prickly pear poppy leaves bear spines on the margin .

Scale leaves : In some plants like onion and ginger , thick fleshy or thin and dry scaly leaves are present. Their function is to store and protect the buds .



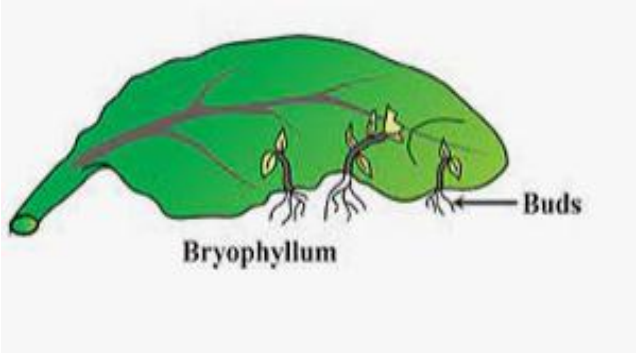
MODIFICATIONS OF LEAF

- In **pea and sweet pea**, the leaves are modified into long, slender, coiled structures called **tendrils.**
- In **cacti** the leaves are modified into sharp, pointed structures called spines .These spines also help to prevent the loss of water through **transpiration.**
- In some **insectivorous plants**, the leaves are modified into **pitcher or bladder** like structures to trap, hold and digest insects and small animals.

Insectivorous Plants

Vegetative Propagation in leaves

- Apart from flower buds, there are buds in the axil (point of attachment of the **leaf** at the node) of **leaves** which develop into shoots. These buds are called **vegetative** buds . A bud consists of a short stem around which immature overlapping **leaves** are folded. The **vegetative** buds can also give rise to new plants.



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