

SCIENCE

CHAPTER 7: GETTING TO KNOW PLANTS

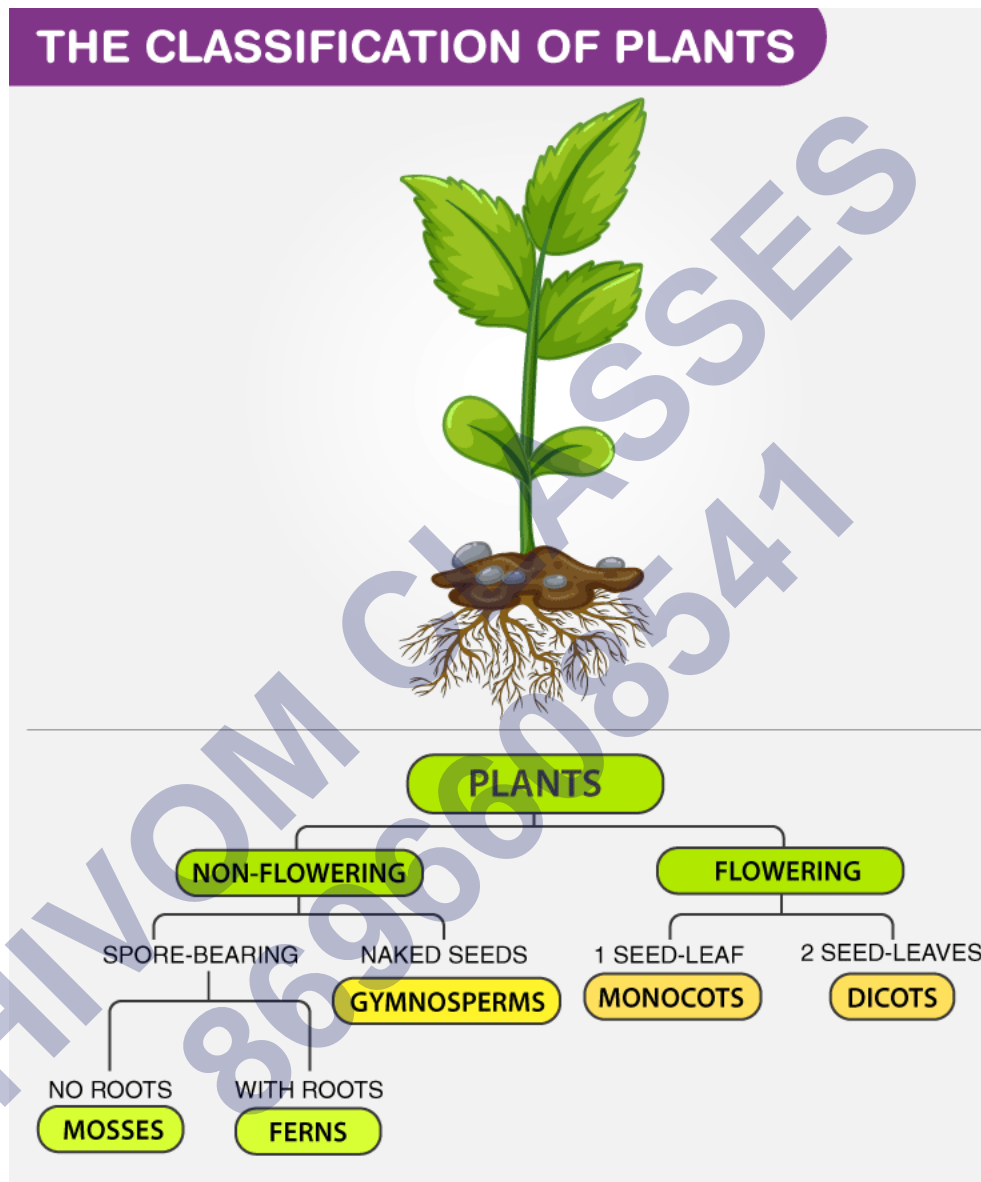


Getting To Know Plants

Introduction

Plants are **living things** which **grow in the soil** and **remain fixed at a place** through their roots.

Classification of Plants



Plants can be classified into various categories depending on various features.

On the basis of flower

Flowering also called **Angiosperms**: Sun flower, Rose, tomato

Non- Flowering also called **Gymnosperms**: Pines, ferns, mosses.

On the basis of their

Size, Type of Stem, spread of branch, plants are classified into 3 categories:

- Herbs

- Shrubs
- Trees

Characteristics	Herbs	Shrubs	Trees
Size	Short plants with height less than 1m	Medium-sized plants with height around 1-3m	Tallest plant with height more than 3-4 m
Nature of stem	Green and tender stem, have a few branches	Hard & woody stem, not very thick.	Thick
Type of branches	Branches are either absent or present sparsely	Branches arise from the base of the stem giving it a bushy appearance	Branches arise from the upper part of the stem at some distances from the ground. Some trees like coconut tree are branch less; they have only one stem that bears leaves, flowers and fruits
Examples	mint, tomato, spinach, wheat, paddy, grass etc.	Rose, lemon, henna, hibiscus etc	Banyan, mango, neem cashew, oak etc

Certain plants have

weak stems and cannot stand upright. They are categorized into two types:

Creepers

- The stems of these plants spread/trail on the ground.
- Stems are long, thin and fragile and cannot stand erect.
- Examples – water melon, strawberry, pumpkin, sweet potato etc



Climbers

- More advanced than creepers.
- They have thin long and weak stems that cannot stand upright but they can use external support to grow vertically and carry their weight.
- These types of plants use special structures called tendrils to climb.
- Examples – pea plant, grapevine, money plant, etc.



Some Other Types of Plants

Moss

- Small nonflowering green plants.
- Grow in damp and shady areas.



Grass

- Flowering plants.
- Short in height.
- Long narrow leaves.



Aquatic Plants

- Grow in water only.
- They are either rooted in mud under water (lotus) or float without any anchorage (water hyacinth) other e.g., water lilies, hydrilla & tape grass.



Types of Plants



Herbs: Plants with green and tender stems.



Shrubs: Stems branch out near the base giving them a bushy appearance.



Tree: Tall plants with hard, thick and brown stem.

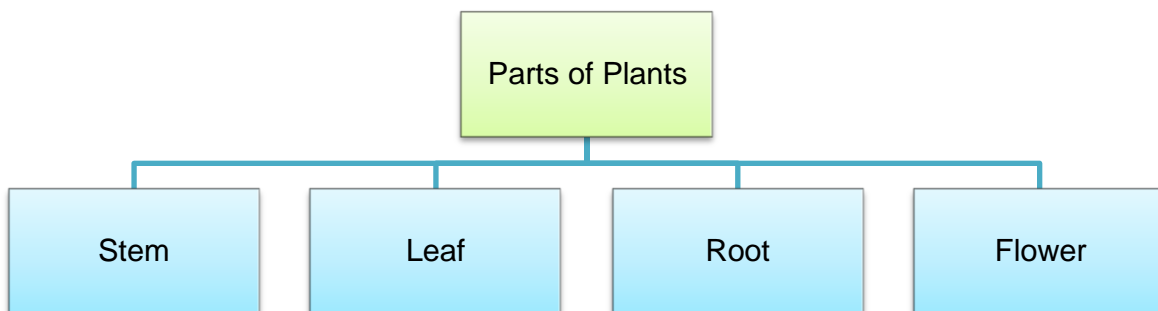


Creepers: These are plants with weak stems and cannot stand upright .

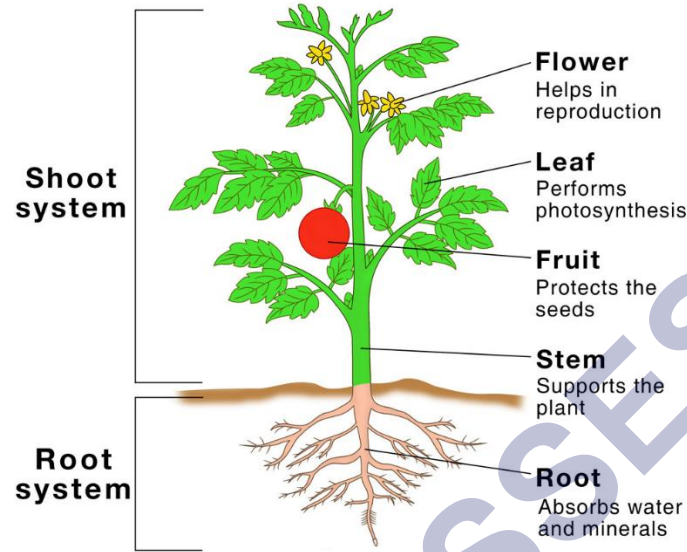


Climbers: These plants take the support of neighbouring structures and climb up. They climb with the help of special organs called tendrils.

Parts of Plants



Parts of a Plant



Stem

- The stem is a **part of the shoot system**. It bears leaves, buds, fruits and flowers. It may be soft or woody.
- Functions of the stem are:

Hold plants upright.

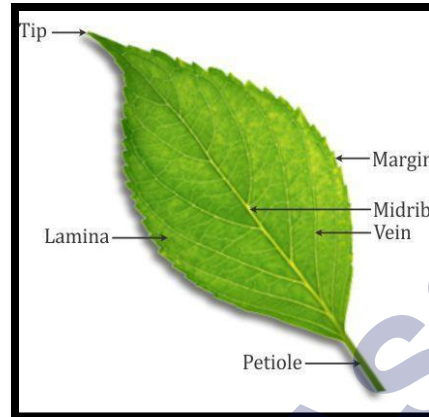
Conduct water and minerals from the roots to the leaves and other parts of plants.

Carry prepared food from the leaves to the other parts.



Leaf

- A leaf is an outgrowth of the stem and is **flat, thin** and **usually green** in colour.
- The leaves may be of different shapes- needle shaped, oval, heart shaped, oblong, circular or tapering.



- The different parts of a leaf are mentioned below:

Lamina

- Flat, green portion of the leaf.
- Also known as **leaf blade**.

Veins

- Form a **supporting framework**.
- Transport raw materials and manufactured food in and out of the lamina.

Midrib

- It is the central vein of the leaf.
- Smaller veins grow from the midrib.

- The primary functions of leaves:

Plants perform photosynthesis. They manufacture food from carbon dioxide and water with the help of chlorophyll and light energy.

Stomata present on leaves help plants in the exchange of gases.

During respiration, plants lose excess amount of water through the stomata which helps in cooling the plant.

- The pattern or arrangement of veins on a leaf is termed as venation. There are two basic types of venation:



Reticulate Venation

The veins originating from the midrib branch give rise to a **net-like pattern** on the leaf.

Examples: Peepal and mango



Parallel Venation

The veins originating from the midrib run **parallel** to one another.

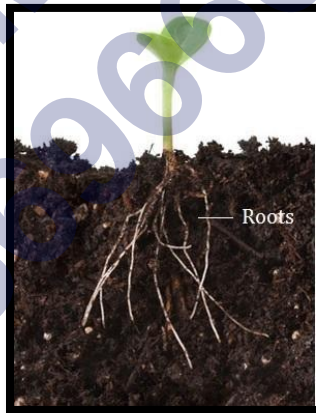
Example: Banana leaf

In some plants, veins run parallel from the tip to the base of the leaf.

Example: Grass

Root

- Roots are **present below the ground** and generally, are not green in colour.
- They do not bear flowers, fruits or leaves.

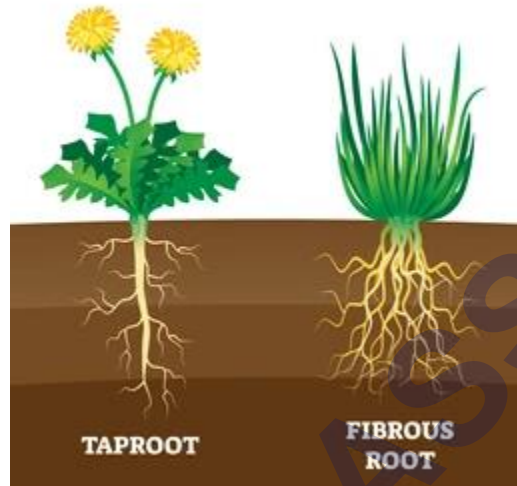


- The first root of a plant is the **radicle**, which is present within the seed. It gives rise to the **primary root** from where the plant develops its root system.
- Depending on its type, a plant develops either a **taproot system** or a **fibrous root system**.

Tap Root System	Fibrous Root System
<ul style="list-style-type: none"> A thick central primary root called tap root. 	<ul style="list-style-type: none"> A cluster of roots originates at the base of the stem.

- Tap root gives rise to several lateral secondary roots.

- All roots are equal in thickness and give a bushy appearance together.



- Roots have the following functions:

Fix the plant to the soil.

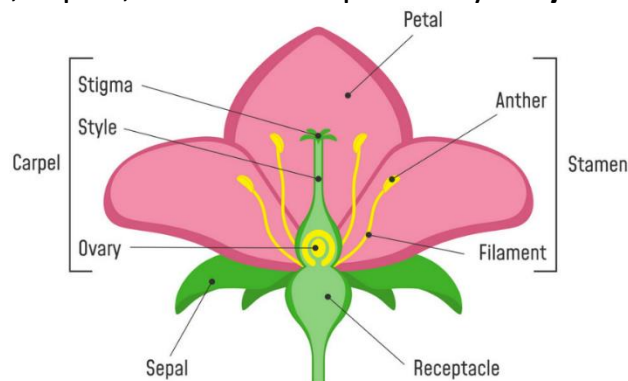
Absorb minerals and water from the soil.

Help to bind the soil together so that it does not get washed away during rain or blown away by the wind.

Some roots such as carrot, radish, sweet potato, turnip and tapioca store excess food. These are actually modified roots which are commonly consumed by us.

Flower

- A flower is a **reproductive structure** found in flowering plants.
- The structure of flowers may not be the same in all plants.
- The number of petals, sepals, stamens and pistil may **vary** from plant to plant.



Petals

- Prominent parts of an open flower.
- Protect the reproductive organs of the plant.

Sepals

- Green, small leaf-like structures.
- Protect the bud.
- They are either separate or joint to one another.

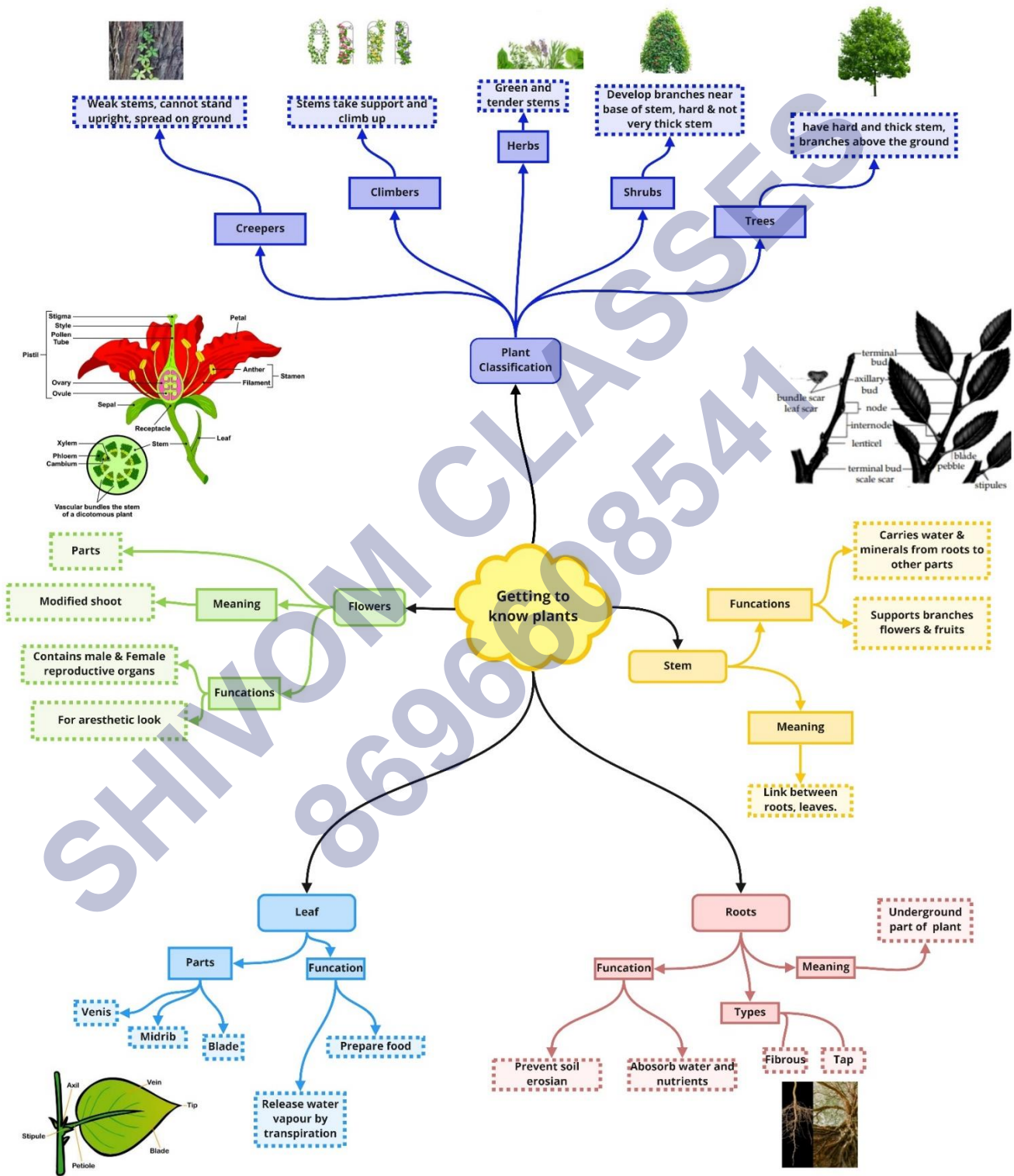
Stamen

- **Male reproductive part.**
- Consists of an **anther** and a **filament**.
- anthers contain pollen grains which produce male gametes.

Pistil

- Innermost part of the flower.
- **Female reproductive organ.**
- Also known as **carpel**.
- Consists of stigma, style and ovary.
- **Stigma** is a sticky disc like stop part of the pistil on which the pollen grains settle.
- **Style** is the middle part which connects the stigma to the ovary.
- **Ovary** is the lowermost swollen part containing one or more ovules.
- Ovules are female gametes.

Class : 6th Science
Chapter- 7: Getting to know plants



Important Questions

Multiple Choice Questions:

Question 1. _____ is the part of the stem between two nodes.

- (a) Node
- (b) Midrib
- (c) Internode
- (d) Veins

Question 2. The arrangement of leaves at a node is:

- (a) Phyllotaxy
- (b) Stamen
- (c) Petals
- (d) Sepals

Question 3. The root absorbs water from the:

- (a) Stem
- (b) Soil
- (c) Branches
- (d) Flower

Question 4. The outside the soil gives support to the branches of the plants and trees due to which they do not break.

- (a) Stem
- (b) Soil
- (c) Branches
- (d) Roots

Question 5. Name plants which have roots outside the soil.

- (a) Sugarcane
- (b) Money plant
- (c) Banyan
- (d) All of these

Question 6. Which part of the plant joins leaf and root ?

- (a) Branches

- (b) Buds
- (c) Flowers
- (d) Stem

Question 7. Those roots come out from the base of stem is:

- (a) Taproot
- (b) Fibrous roots
- (c) Veins
- (d) None of these

Question 8. The branches of this root arise from a thick structure under the ground are:

- (a) Taproot
- (b) Fibrous roots
- (c) Veins
- (d) None of these

Question 9. A process in which water comes out from the leaves in the form of vapour is:

- (a) Photosynthesis
- (b) Transpiration
- (c) Venation
- (d) Conduction

Question 10. In leaves the veins run parallel to each other in:

- (a) Reticulate venation
- (b) Parallel venation
- (c) Both (a) and (b)
- (d) None of these

Question 11. The leaf has a network of veins on both sides of the midrib in:

- (a) Reticulate venation
- (b) Parallel venation
- (c) Both (a) and (b)
- (d) None of these

Question 12. The swollen part of the pistil is:

- (a) Ovules

- (b) Petals
- (c) Ovary
- (d) Sepals

Question 13. Flowers that have stamens and no pistils are:

- (a) Male flowers
- (b) Female flowers
- (c) Both (a) and (b)
- (d) None of these

Question 14. Those flowers have both segments and pistils are:

- (a) Bisexual
- (b) Unisexual
- (c) Stamen
- (d) None of these

Question 15. Pollen grains are produced in:

- (a) Stamen
- (b) Anthers
- (c) Pistil
- (d) All of these

Very Short Question:

1. List few plants found around your house.
2. Are all the plants same in size?
3. What are the major parts of plants?
4. How many kinds of plants are there?
5. Name two plants that belong to herbs.
6. Give two examples of shrubs.
7. Give two examples of trees.
8. Define petiole.
9. What is lamina?
10. What are veins?

Short Questions:

1. What are weeds?
2. Classify plants and give an example of each.
3. What are herbs? Give two examples.
4. What are shrubs? Give two examples.
5. What are trees? Give two examples.
6. What are creepers? Write an example.
7. What are climbers?
8. Explain an activity to show that stem conducts water and other substances.

Long Questions:

1. What do you mean by leaf venation? Explain various types of leaf venation with example.
2. Explain the structure of a typical flower with the help of a diagram.
3. Explain an activity to test the presence of starch in a leaf.
4. Explain that sunlight is essential for photosynthesis.
5. Explain the important functions of root.
6. Explain various kinds of roots with the help of an example.

Answer Key-

Multiple Choice Answers:

1. (c) Internode
2. (a) Phyllotaxy
3. (b) Soil
4. (d) Roots
5. (d) All of these
6. (d) Stem
7. (b) Fibrous roots
8. (a) Taproot
9. (b) Transpiration
10. (b) Parallel venation
11. (a) Reticulate venation
12. (c) Ovary

13. (a) Male flowers
14. (a) Bisexual
15. (b) Anthers

Very Short Answers:

1. Answer: Mango, neem, grass, chilli, palak and banyan tree.
2. Answer: No, all plants are of different sizes.
3. Answer: Stem, root, leaves and flowers.
4. Answer: There are three kinds of plants:
 - (i) Herbs
 - (ii) Shrubs
 - (iii) Trees
5. Answer:
 - (i) Tomato
 - (ii) Potato
6. Answer:
 - (i) Lemon
 - (ii) Orange
7. Answer:
 - (i) Mango
 - (ii) Neem
8. Answer: The part (stalk) of a leaf by which it is attached to the stem is called petiole.
9. Answer: The broad green flat part of leaf is called lamina.
10. Answer: The lines on the leaf are called veins.

Short Answer:

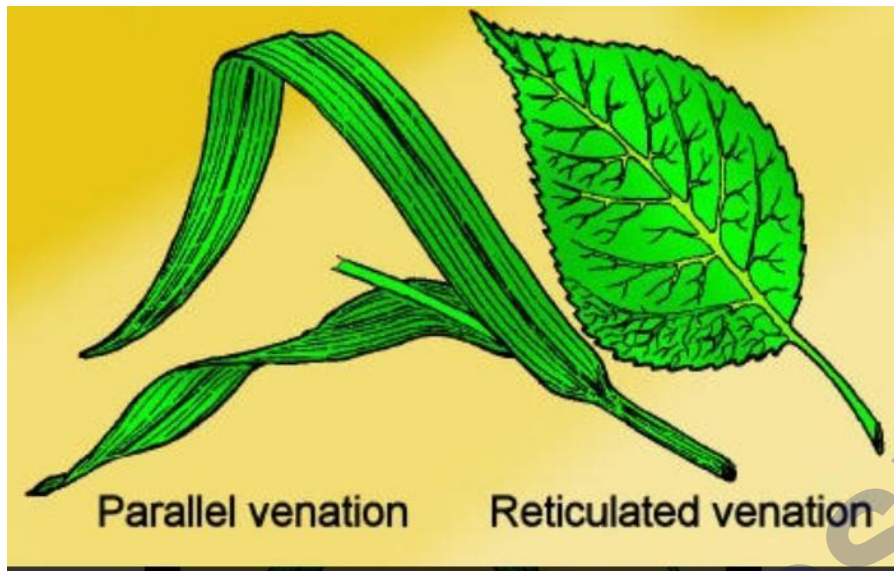
1. Answer: The unwanted plants that grow in the fields with the main crops or in their surroundings are called weeds. Weeds are the plants which are not grown by the farmers. For example, grass.
2. Answer: On the basis of various characteristics most of the plants can be classified into three categories:
 - (i) Herbs, e.g., tomato
 - (ii) Shrubs, e.g., lemon

- (iii) Trees, e.g., mango
3. Answer: The plants with green and tender stems are called herbs. They are usually short and may have no or less branches. For example, tomato, potato.
 4. Answer: The plants which have a hard but not a very thick stem are called shrubs. Such plants have the stem branching out near the base. For example, lemon, rose plants.
 5. Answer: The plants which are very tall and have hard and thick brown stem are called trees. The stems have branches in upper part and much above the ground. For example, mango, neem.
 6. Answer: The plants with weak stem that cannot stand upright and spread on the ground are called creepers. Various types of grasses are the examples of creepers.
 7. Answer: The plants that take support of neighbouring structures and climb up are called climbers. They have weak stem. For example, grapes, money plant, beans.
 8. Answer: Take some water in a glass. Add few drops of red ink to the water. Cut the stem of a herb plant from its base. Put it in the glass as shown in figure. We will see that some parts of the stem become red. This activity shows that stem conducts water.



Long Answer:

1. Answer: Leaf venation: The design made by veins in a leaf is called leaf venation. There are the following two types of leaf venation:
 - (i) Reticulate venation: If the design of veins makes a net-like structure on both the sides of midrib then it is called reticulate venation. For example, mango leaf, gram leaf.
 - (ii) Parallel venation: If the veins are parallel to each other or to midrib then such type of venation is called parallel venation. For example, wheat leaf, barley leaf.



2. Answer: A typical flower contains the following parts:

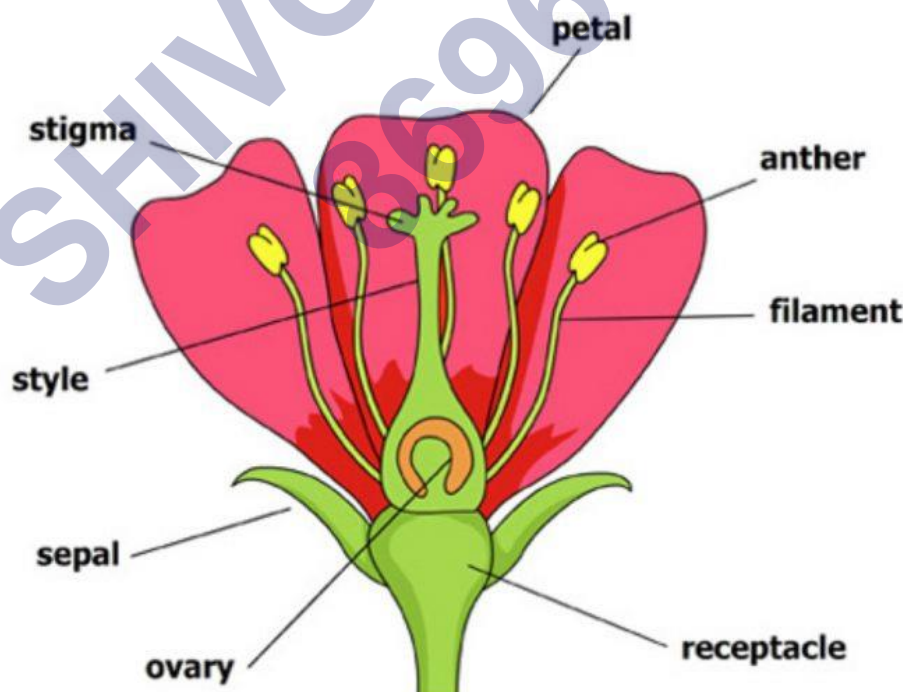
(i) Stalk: The part by which a flower is attached to the branch is called stalk.

(ii) Sepals: The small green leaf-like structures of the flower are called sepals,

(iii) Petals: The big coloured leaf-like structures are called petals. Different flowers have petals of different colours.

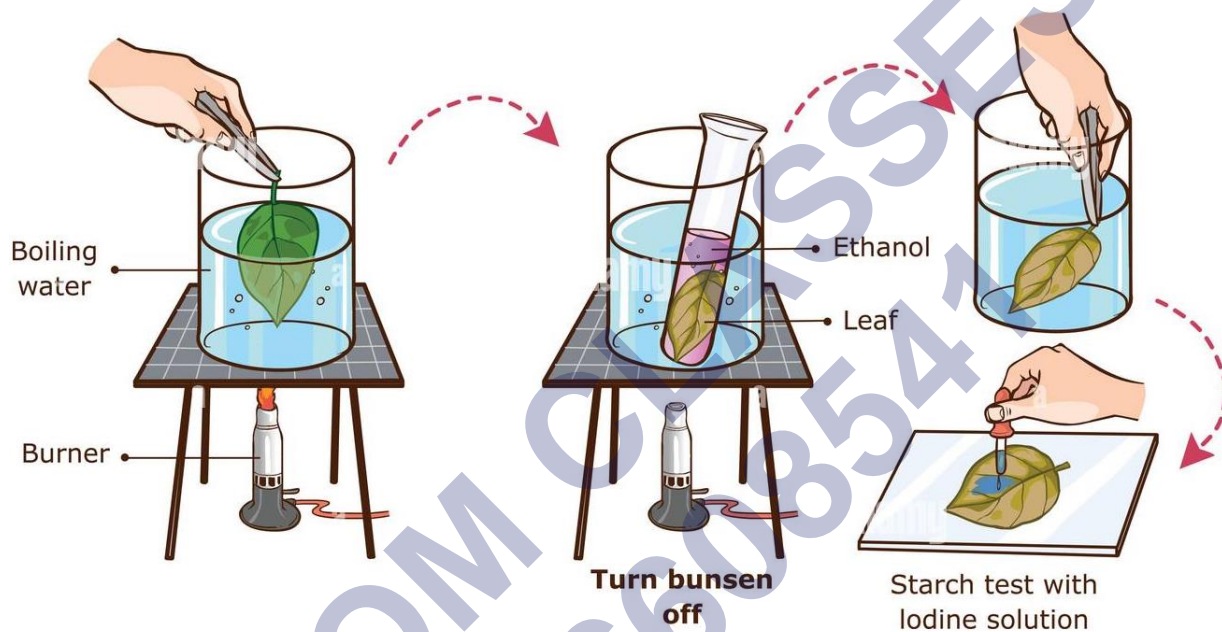
(iv) Stamen: It is the male part of the flower. It has two parts: (a) Filament and (b) Anther.

(v) Pistil: The innermost part of a flower is called pistil. It has three parts: (a) Stigma, (b) Style and (c) Ovary. It is the female part of the flower.

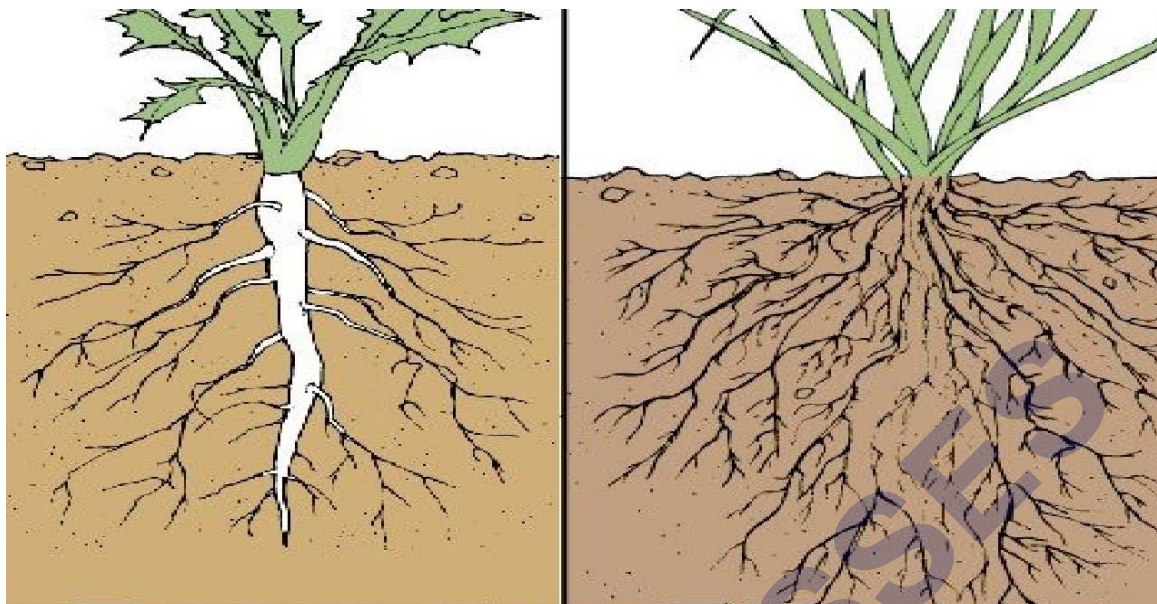


3. Answer: Take a leaf in a test tube and pour spirit till it completely covers the leaf. Now put the test tube in a beaker having water. Heat the beaker till all the green colour from the leaf comes out into the spirit in the test tube. Take out the leaf and wash it with water. Put it on a plate and pour some iodine solution over it. The iodine solution is brown in colour but when it comes in contact with starch it turns blue-black. The iodine solution will turn blue-black when dropped on the leaf, this confirms the presence of starch in the leaf.

Testing a leaf for starch



4. Answer: Take a potted plant having green leaves. Place it in a dark room for a day or two so that all the starch present in leaves is used by the plant. Now cover a portion of leaf with black paper and keep the plant in the sun for a day. Pluck the leaf, remove the black paper and test it for the starch. We see that only that part of the leaf becomes blue-black which was open to sun. The covered part does not become blue-black. This shows that no starch is formed because it gets no sunlight.
5. Answer: The following are the functions of root:
- They help to absorb water from the soil.
 - The roots help in holding the plants firmly in the soil.
 - They are said to anchor the plant to the soil.
6. Answer: There are following two types of roots:
- Tap roots:** The roots which have one main root and other smaller lateral roots are called tap roots. For example, mustard plant, gram.
 - Fibrous roots:** The roots which have no main root but all the roots appear similar are called fibrous roots. For example, maize, wheat.

**Taproot****Fibrous**

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