

UNIT 8 Plant parts and their functions

In unit 2, we learnt about the classification and basic parts of plants. Here, we will learn in greater details about the different functions carried out by the plant parts. Let us first understand the characteristics of plants.



Characteristics of plants

1. **Plants** and animals are alike in that they need **air**, **water** and **food** to survive, because they are **living things**.
2. *Plants* can **grow** and **reproduce** by dispersing seeds. These seeds will then grow into new *plants*.
3. *Plants* cannot move freely in the same way as animals do, but they will **respond** to sunlight and water by moving slowly towards them. The *mimosa plants* can even close up their leaves when they are being touched.



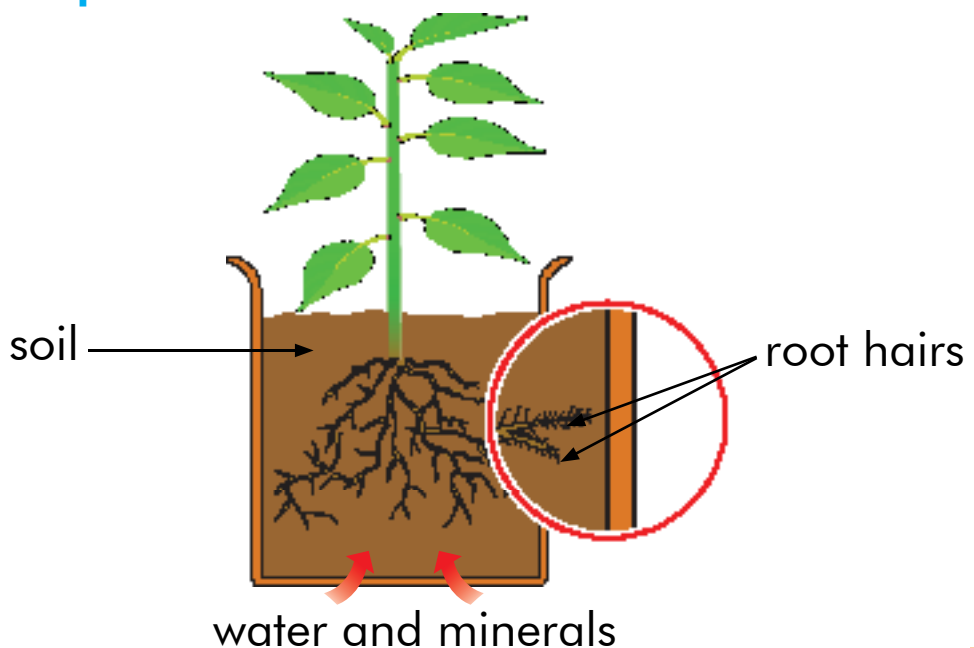
Parts of a plant and their functions

Plants have different parts, and each part perform different functions. The different parts of plants are **roots, stems, leaves, flowers, fruits** and **seeds**.

1. Roots

- a. This part of the *plant* **grows** firmly **underground**. It can prevent the wind from blowing the plant over, or animals from pulling them out easily.
- b. The most important function of the **roots** is for **absorbing nutrients, minerals** and **water** from the soil. There are very fine hair called **root hairs** on the *roots* to help the *plant* **absorb larger** amount of water and minerals.

Examples:

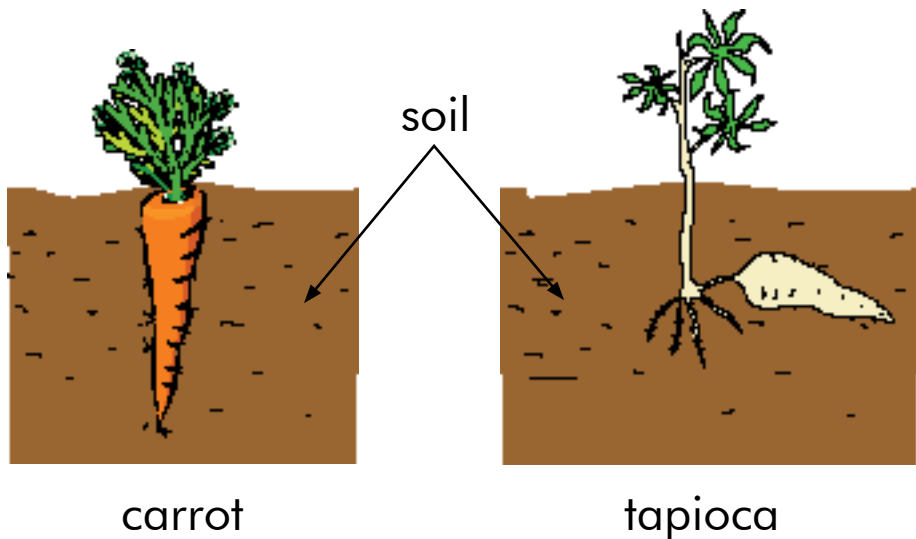


- c. Besides the above mentioned functions, these *roots* actually have some other special functions. These **special roots** include **storage roots**, **clasping roots**, **breathing roots** and **prop roots**.

i. **Storage roots**

Some examples of **storage roots** are carrot, tapioca, beetroot and sweet potato. These *roots* are swollen and fat because they **store food** and **water** inside them. Do you know that we are actually eating the roots and not the fruit when we eat carrot for example?

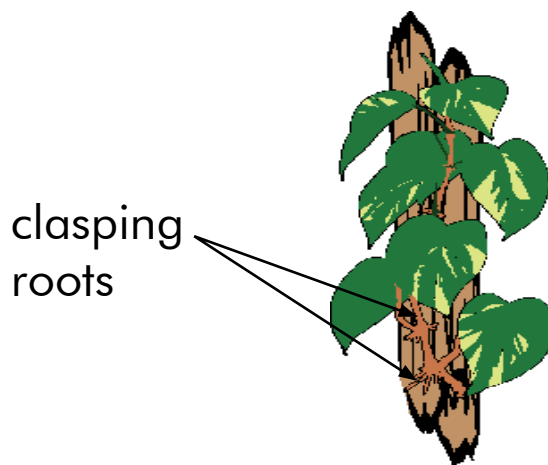
Examples:



ii. Clasping roots

A *plant* that comes with **clasping roots** usually has a **weak stem**, and these *roots* will grow from the **nodes** of their stem. In this way, the *roots* can hold on to something for support. Money plant is one of such *plants* that grasp on upright wooden stick for support.

Example:



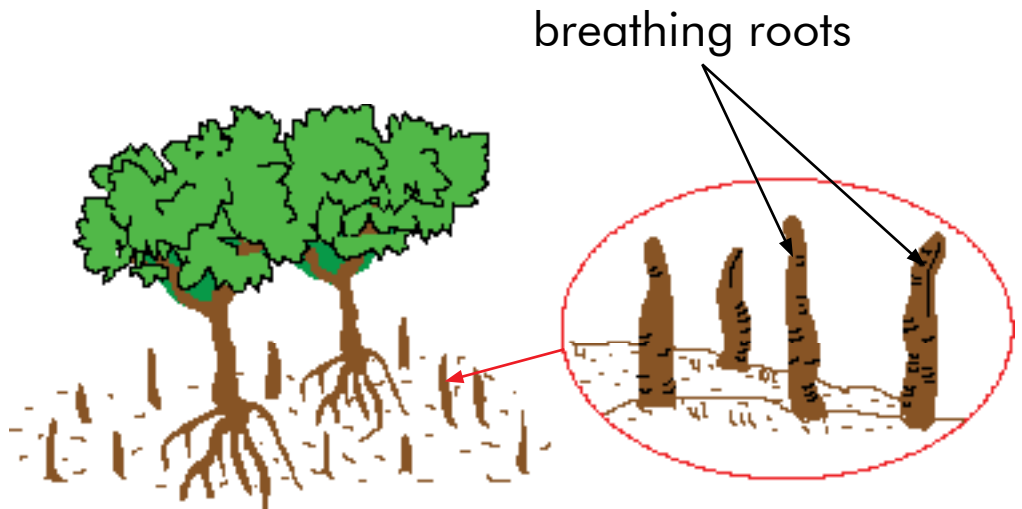
money plant



iii. Breathing roots

Due to the soil condition, which is poorly aerated and has little nutrients, the *roots* of mangrove plants need to grow upwards out of the soil to breathe in air. Hence, such *roots* grow in the coastal areas or river banks.

Example:



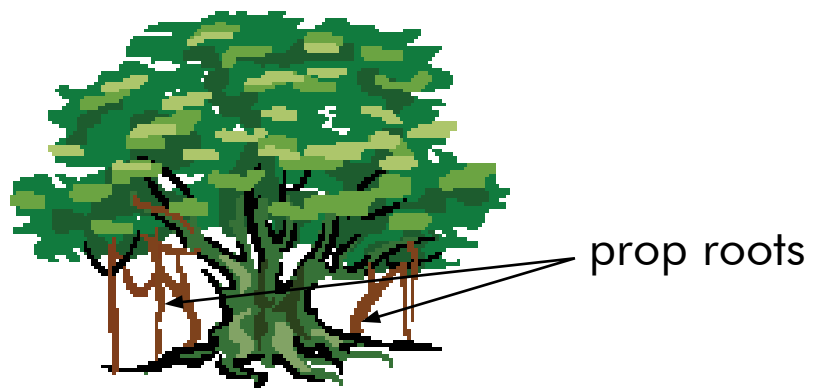
mangrove plants



iv. Prop roots

These **roots** grow from the **stem** or **branches** above the ground into the soil to give the tree additional support. The banyan tree is one such trees.

Example:



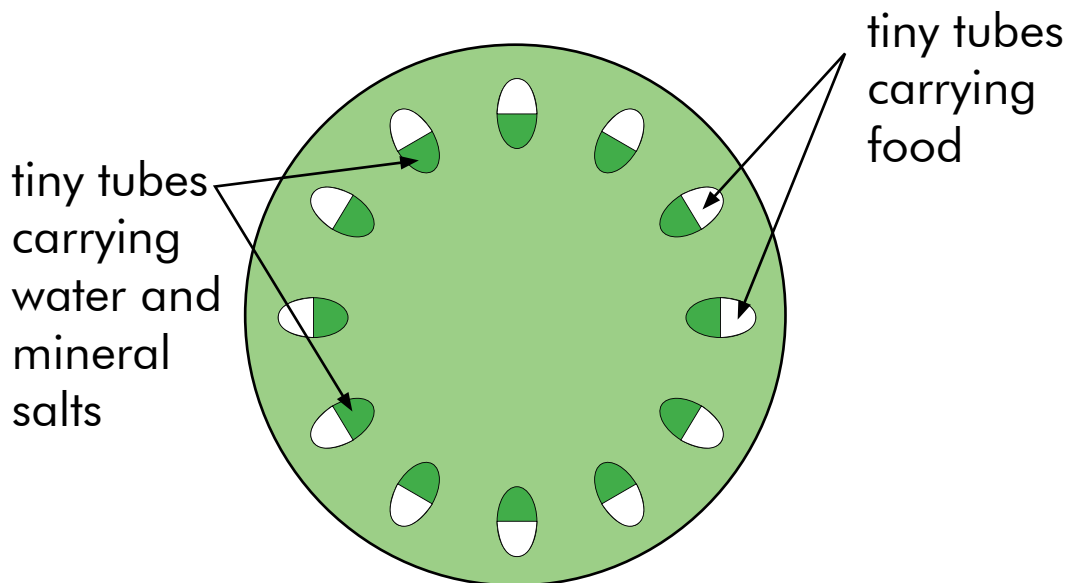
banyan tree



2. Stems

- a. The **stem** of a *plant* joins the *roots* to the rest of the *plant*.
- b. The **branches** and **leaves** are **supported** by this *stem*, which grow upwards above the ground so that they can get as much sunlight as possible.
- c. The *stem* **transports food, water** and **mineral salts** to all parts of the *plant*.
- d. Inside the *stem*, there are actually **two sets** of tiny tubes. One set will **carry water** and **mineral salts** from the roots to the leaves. The other set will carry **food** from the leaves to different parts of the *plant*.

Example:

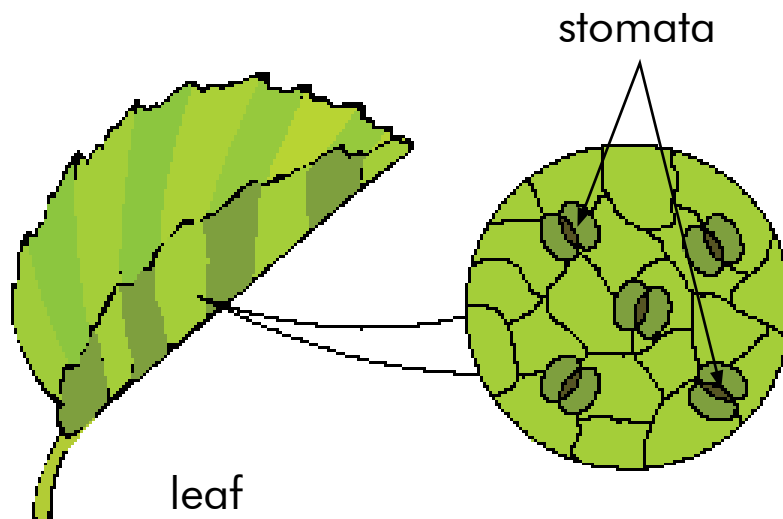


cross-section of the stem

3. Leaves

- a. Though **leaves** involve in giving a *plant* a beautiful body, they actually serve a very important purpose. They **make food** for the whole *plant*. You can call them the “food factories” of the *plant*.
- b. **Photosynthesis** is a **process of producing food** in the presence of **sunlight**, together with **carbon dioxide** and **water**.
- c. For *photosynthesis* to take place, there is this green pigment called **chlorophyll** present in the leaves **to trap energy** from the sunlight.
- d. There are tiny openings called **stomata** on the **underside** of the leaves. **Carbon dioxide** will enter the *plant* through these openings.

Example:

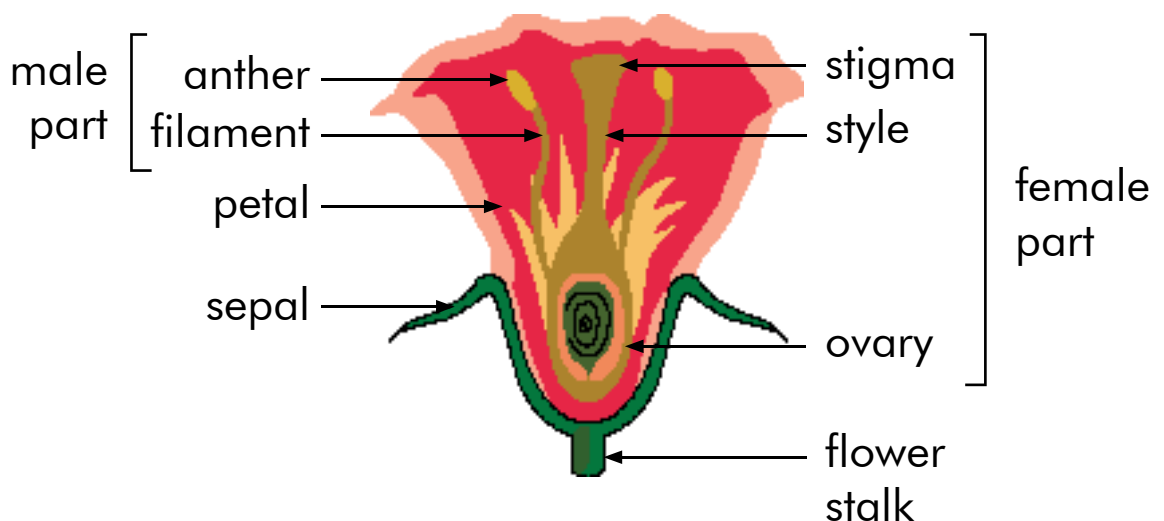


- e. The energy combines with carbon dioxide and water to produce **sugar** and **oxygen**.
- f. This sugar is the **food** for the *plant*, and oxygen will be released to the surrounding air.
- g. Some *plants* do not have green *leaves*, but they can still go through *photosynthesis* because they still contain certain amount of *chlorophyll* in them. An example of such *plant* with mainly red and yellow *leaves* is the croton *plant*.

4. Flowers and fruits

- a. **Flowers** usually make a *plant* look beautiful. After these *flowers* are fertilised, **fruits** will be developed.
- b. Let's take a look at the different parts of a typical *flower*.

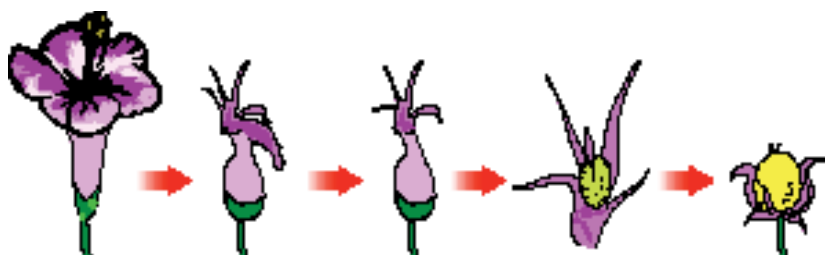
Example:



cross-section of a flower

- c. In a *flower*, there exist both male and female parts. The **male** part is called the **stamens**. The **female** part is called the **pistil**.
- d. The **petals** are the **colourful part** of a *flower* that attracts the insects to them.
- e. The **ovary** of the *flower* is the part that will develop into **fruit**. Inside the ovary are the **ovules**, which will develop into **seeds**.
- f. The **sepals** are the **protective part** of the *flower* when it was still in the bud.
- g. The *fruit* helps to **protect** the seeds inside them until they are ready to produce new *plants*. These *fruits* also help to **disperse** or **scatter** the seeds in order not to overcrowd the areas beneath the *plant*. Furthermore, they need not fight for sunlight and nutrients in the growing process.
- h. There are various **stages** for a *flower* to turn into a *fruit*. When the petals of a *flower* **wither**, it will **drop** off and the **ovary grows** bigger and **changes** into a *fruit* as shown.

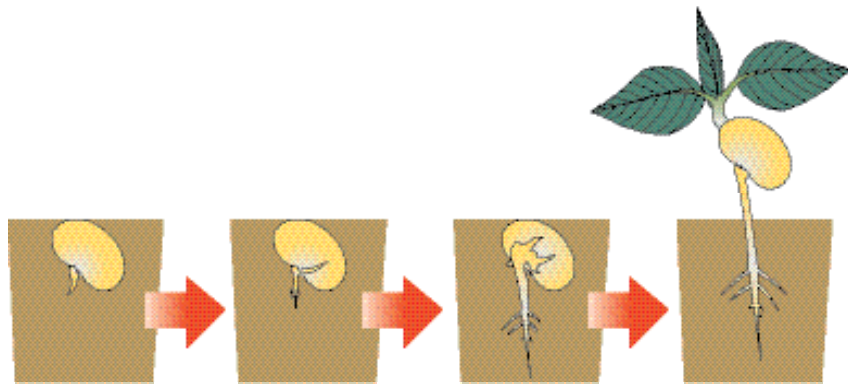
Examples:



5. Seeds

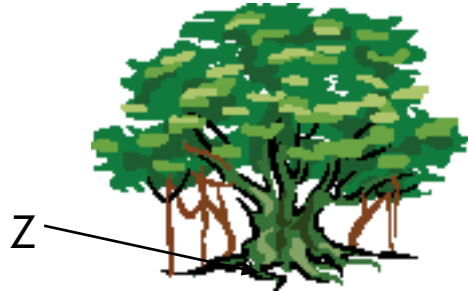
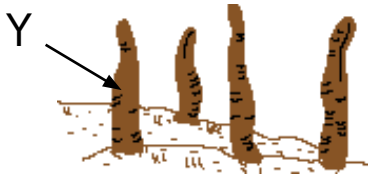
- a. After the **seeds** are dispersed to the ground, they are capable of growing. In the presence of air, water and warmth, when a *seed* starts to grow, we say that it **germinates**.
- b. Let us look at the **stages** in the development of a bean seed.

Examples:



Worked Examples

1. In the diagram, the parts marked 'Y' and 'Z' are the roots of the tree. State the functions of these roots.



- (1) What can be the function of the roots marked 'Y'?

- (2) What can be the function of the roots marked 'Z'?

Solution: (1) To take in air for the tree.

(2) To hold the tree to the ground.

2. The leaves contain a green substance called _____ which traps energy from the sunlight.

- (1) pigment (2) colouring
(3) chlorophyll (4) sunlight

Solution: (3) chlorophyll



Worked Problems

1. Fill in the blanks with suitable words in the box. You may use the word more than once.

chlorophyll sunlight breathe food
water oxygen carbon dioxide

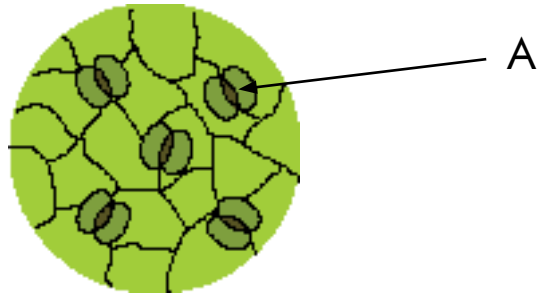
(1) Plants will take in (a) and give out (b) when they (c) . They prepare (d) using (e) and (f) in the presence of (g) and (h) .

root hairs minerals water nutrients

The most important function of the roots is for absorbing (i) , (j) and (k) from the soil. There are very fine hair called (l) on the roots to help the plant absorb larger amount of water and minerals.

Solution: (a) carbon dioxide (g) sunlight
(b) oxygen (h) chlorophyll
(c) breathe (i) nutrients
(d) food (j) water
(e) water (k) minerals
(f) carbon dioxide (l) root hairs

2. (1) The part marked 'A' in the diagram is known as



(2) Give any two functions of the part marked 'B' in the tree.

(i)

(ii)



Solution:(1) Stomata

(2) (i) It holds and spread the leaves far and wide so as to get as much sunlight as possible.

(ii) It transport food, water and mineral salts to all parts of the plant.

