Topics To Be Discussed
1. Root
2. Stem
3. Leaf
4. Storage and distribution of food

Learning Objectives
You will be able to understand
1. Functions of root
2. Functions of stem
3. Functions of leaves
4. How is food stored in plants?

Launch Pad
Have you ever wondered from where your textbooks, notebooks and pencils are obtained? The wood from the plants is used in making all these articles.

Can you list five things in your house made up of wood?
1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

Is wood the only useful product given to us by plants? Plants have leaves, flowers, fruits and roots also. Do you know all of these are useful to us in many ways?

List the uses of flowers in our daily lives:
1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
Apart from all these things, plants give us something we cannot live without. Do you know what it is?

This precious resource is oxygen.

When plants make their food by the process of photosynthesis, they give out oxygen. In order to understand how they do it, let us understand the process in detail.

Have you seen your mother prepare food? She gets all the vegetables, flour and spices from market before preparing food in the kitchen. Similarly, plants get raw materials from the environment before making their food. The raw materials needed for this process are water, minerals, carbon dioxide and sunlight. Different parts of plants collect different raw materials and leaves make the food using all of these. Therefore, leaves are also known as the ‘kitchen’ of the plants. Let us understand how all these raw materials are collected.

How does the plant get water?

This function is performed by roots of the plants.

ROOT

The root is that part of the plant which remains under the soil. They not only affix the plant firmly to the ground but also soak water and minerals for the plants. They have small tube like structures which absorb the minerals and water from soil and carry them to the stem.

STEM

The stem grows above the ground. It bears branches on which leaves and flowers grow.
The stem also has many tube-like structures inside it which are extended also from roots. Can you guess the functions of these tubes? Let us perform the following activity to know the answer.

**Activity 1**
1. Take a balsam plant with soft stem and clean its roots.
2. Take a jar of water and add red ink or any food colour to it.
3. Put the plant in the jar in such a way that only the roots are dipped in the coloured water.
4. Observe the plant after few hours. Do you see any change in colour of the stem or leaves?

The stem and the leaves turn red. This happens because the roots absorb the red-coloured water and pass it into the long tubes of the stem from where this colour also reaches the leaves.

Now, we know that the stem carries water from the roots to all parts of the plant.

Sunlight and carbon dioxide required for photosynthesis are taken up by the leaves themselves.

**LEAF**
Leaves are mostly broad and flat green structures of plants but there is a great variety in their shapes and sizes. The flat broad part of the leaf is called the **leaf blade**. In the middle of the leaf blade is the main vein and several side veins or tubes are connected with it. These veins carry water and minerals to all the parts of leaf.

**Did You Know?**
Some plants like crotons have red-coloured leaves. This is because of the presence of red-coloured pigment in them. Their dark, red patches hide the green colour of chlorophyll. But photosynthesis takes place in the leaves only, as chlorophyll is present there.
Have you ever wondered why does a plant have so many leaves? Why are leaves mostly green in colour?

The green colour of the leaves is because of the presence of a green coloured pigment, called **chlorophyll** which helps in trapping sunlight for **photosynthesis**.

Sunlight provides energy for preparing food in the leaves. In fact, ‘**Photo**’ means light and ‘**synthesis**’ means putting together.

Larger the plant, more food it needs to live. Therefore, bigger plants have more number of leaves. We should water plants properly to keep the leaves healthy and green.

**Activity 2**

1. Take two potted plants of the same kind.
2. Water one of the plants every day. Do not water the other.
3. Observe the changes after two days. Which plant looks weak with dried up leaves? Why?

How does carbon dioxide enter the leaves?
Leaves have many tiny pores on its surface which can be seen only under a microscope. These pores are called **stomata**. Air enters the leaves through the stomata. When the leaves make food, they take in carbon dioxide and give out oxygen through the stomata. The oxygen is released as a by-product of the process. It is used by all living things for breathing.

**Definition:**
Tiny openings on the surface of a leaf through which exchange of gases takes place are called **stomata**.


**Definition:**
Starch is a bigger sugar which is formed by joining many glucose units.

**STORE AND DISTRIBUTION OF FOOD**

The food prepared by photosynthesis is in the form of **glucose**. It is a kind of sugar and is converted into **starch** by plants.

Do you know what happens to the food made by the plants? The food prepared in leaves is sent to all parts of the plant by long tube-like structures.

Some part of the food is used by the plants to produce energy for their survival and for their growth. The rest of the food is converted into starch and is stored in different parts of the plant like **fruits**, stems and roots.

For example food is stored in **roots** in the plants of radish and carrot.

Similarly, the **leaves** of cabbage and mint store the food in them.

Some of the food-storing **stems** are potato and sugarcane.

Humans and other animals use this stored plant food for eating and obtaining energy.

Let us check the presence of stored food (starch) in potato by performing Activity-3.

**Activity 3**
Take a slice of potato and put a few drops of iodine solution on it. Starch reacts with iodine and gives a blue-black colour.

Here, we see that the slice of potato changes its colour from golden yellow to blue-black. This shows the presence of starch in potato which is a stem.
Recap:

1. Plants provide us food and oxygen.
2. The roots of a plant fix it to the ground and absorb water and minerals.
3. The stem supports the plant and carries water and minerals to all parts of the plant.
4. Green leaves prepare food for the plant with the help of a green-coloured substance called chlorophyll.
5. Photosynthesis is the process of making food by the leaves of a plant, with the help of water, carbon dioxide and sunlight in the presence of chlorophyll.
6. Leaf has tiny pores on its surface called stomata from which it gets carbon dioxide.
7. Food prepared by the plant is in the form of glucose. Plants use some of the food for their growth and survival.
8. The rest of the food is turned into starch. It is stored in different parts of plants, such as fruits, stems, leaves and roots.

Exercises

(Tasks for SA and FA)

1. **Tick (✓) the correct option:**
   (a) The part of the plant that is under the ground:
      (i) root (ii) stem (iii) branch (iv) leaf
   (b) ______________ are also called ‘kitchen of the plant’.
      (i) Flowers (ii) Leaves (iii) Fruits (iv) All of these
   (c) Photosynthesis does not require:
      (i) sunlight (ii) carbon dioxide (iii) oxygen (iv) water
   (d) ______________ helps leaves to absorb sunlight.
      (i) Veins (ii) Stomata (iii) Chlorophyll (iv) All of these
   (e) The air enters through the stomata present on the ______________ of a plant.
      (i) roots (ii) branches (iii) leaves (iv) flowers

2. **State True (T) or False (F):**
   (a) Fruits store extra food as starch.  
   (b) Iodine on mixing with starch turns blue-black.
   (c) We eat roots of potato as food.
   (d) Plants prepare their food in flowers.
   (e) Veins and blade are found in leaves.
3. **Match the following:**
   (a) Roots  
   (b) Green leaves  
   (c) Plants prepare food by  
   (d) Stomata  
   (e) Plants convert glucose into  
   kitchen of the plant  
   photosynthesis  
   absorb water and minerals from soil  
   starch  
   tiny openings in the leaves

4. **Name these:**
   (a) The food storing leaves are _____________ and _____________.
   (b) The green-coloured substance found in leaves. ________________
   (c) Part of the plant where food is made. ________________
   (d) A gas given out when plants make food. ________________
   (e) Plants need this gas for photosynthesis. ________________

5. **Answer the following questions:**
   (a) The process by which green plants prepare food is called photosynthesis. Why?
   (b) Name three things required by plants to make food. Where do they get these things from?
   (c) What is the role of stomata?
   (d) Give some examples of food storing parts in plants.

6. **HOTS and PSA:**
   How does cutting down trees affect our breathing?

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**Activities for FA:**

**Activity-1:** Test for presence of starch

**Materials required:** Iodine, groundnut, spinach, lemon juice and sweet potato

**Steps:**
1. Take all the four samples and cut a fine slice out of each of them.
2. Put a few drops of iodine on each of the slice and see whether the colour changes to blue black or not.
Activity-2: Leaf skeletons

Materials required: Different leaves, pan, washing soda, water.

Steps: (Perform this activity under the supervision of an adult.)
1. Collect different type of leaves. Now, take water in a pan and add 2 tablespoons of washing soda to it. Heat the pan till water starts boiling.
2. Place the leaves in hot water for 30 minutes and then let cold water flow for a few minutes.
3. The soft parts of the leaves will fall off and you can see the main vein and the side veins of the leaves. Your leaf skeletons are ready! Paste them in your scrapbook or nature album.

Fun Time:

Crossword
Solve the crossword with the help of the given clues:

Down
1. Flower changes into this.
2. Kitchen of plant.
6. It helps in transporting material from roots to leaves.

Across
1. Colourful part of a plant.
3. It grows into a flower.
4. Part of plant below the ground.
5. It grows into a new plant.