Chapter – 5 Nutrition in Plants Class – 4 E.V.S

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Therefore plants are Autotrophs. Animals including human beings get their food from the plants. Thus, human beings and all other animals are directly or indirectly dependent on the plants. Other organisms which cannot make their food on their own are called Heterotrophs.



FOOD PREPAR ATION BY THE PLANTS

Plants are the only living things that prepare their food in the sunlight by using water, carbon dioxide and minerals. Leaves carry out the preparation of food. The process in which the green leaves make food is called **Photosynthesis.** Leaves are the food factories of the plants.





Parts involved in photosynthesis

Leaves are the most important part of the plant as they carry out the process of photosynthesis. Roots absorb water and minerals from the soil. Stem carries these minerals and water to the leaves. Leaves take carbon dioxide from the air and energy from the sun to make food. Sunlight is necessary for photosynthesis (see activity 1). **To show that sunlight is necessary for the process of photosynthesis. Material required:** A potted plant, beaker filled with water, bunsen's burner, iodine solution, alcohol, watch glass and a test tube.

Method: Take a healthy potted plant. Keep it in the dark for 24 hours. After 24 hours, cover the upper and lower surface of one leaf with black strips and put the plant under the sun. After 3-4 hours pluck the covered leaf and one

uncovered leaf. Remove the covering of





the leaf and boil them in water. Again boil them in alcohol. Wash the leaves with cold water and place them in a watch glass. Now pour some drops of iodine solution over the leaves.

Result: The leaf which has been exposed to sunlight turns blue. There is

no colour change in the covered leaf.

This experiment shows that sunlight is necessary for the process of photosynthesis.

STRUCTURE OF A LEAF

Almost all the leaves have broad and flat surface. **Observe a fresh flat surfaced leaf.** There is a main vein running through the middle of the leaf. This main vein is called the midrid. There are large midrib number of side veins emerging from the main Stipules vein. Water and minerals reach the leaf through this vein. This vein also carries food prepared by the leaf to different parts

of the plant. In the leaf, there is a substance called chlorophyll which is the reason for the green colour of the leaves. Chlorophyll is necessary for photosynthesis (see activity 2).

Blade

Vein

Leaf

Midrib





Chlorophyll absorbs sun's energy, to prepare food.

In the lower surface of the leaf, there are very tiny pores called the stomata . During photosynthesis, leaf takes in carbon dioxide and gives out oxygen and water vapour, through the stomata.









To show that chlorophyll is necessary for the process of photosynthesis. Material required: A potted croton plant, beaker filled with water, bunsen's burner, iodine solution, alcohol, watch glass and a test tube.



Method: Take a healthy potted croton plant. Keep it under the sun. After 3-4 hours pluck a leaf, mark the green areas of the leaf and boil it in water. Again boil it in alcohol. Wash the leaf with cold water and place it in a watch glass. Now pour some drops of iodine solution over the leaf.





Result: The green areas of the plant turns blue.

This experiment shows that chlorophyll is necessary

for the process of photosynthesis.





HOW DO PLANTS USE FOOD?

Food prepared by the leaves is called starch (see activity-3). Starch is a kind of sugar. This starch is utilised by the plants, in the following ways: a. To produce new cells and to repair the old ones. b. To produce different parts such as leaves, flowers and fruits. c. To produce energy for the growth.







The rest of the starch is stored in fruits, seeds, leaves, roots or stem by the plants. This stored starch is further consumed by the animals and human beings.







To show that starch is formed during photosynthesis. Material required: A potted plant, beaker filled with water, bunsen's burner, iodine solution, alcohol, watch glass and a

test tube.









Method: Take a healthy potted plant. Keep it under the

sun. After 3-4 hours pluck a leaf and boil it in the water.

Again boil it in alcohol. Wash the leaf with cold water and place it in a watch glass. Now pour some drops

of iodine solution over the leaf.







Result: The leaf turns blue.

Iodine gives blue colour when reacts with starch (the food prepared in the photosynthesis).

This experiment shows that starch is formed during photosynthesis.





Check Your Knowledge

Fill in the blanks.

- 1. The main vein of a leaf is called
- 2. The green colour of leaves is due to _____
- 3. The tiny pores in the leaves is called _____



OTHER MODE OF NUTRITION IN PLANTS

Some plants like Amar Bel, absorb food from the plant on which it climbs. There are some plants which feed upon the insects. Such plants have colourful flowers to attract the insects.

INTERESTING FACTS

 The giant sequoia of California is one of the tallest tree in the world. It is more than 360 feet high.









Some plants like crotons and coleus have coloured leaves. The green colour is hidden by the red pigment of their leaves. Since they have chlorophyll, they carry out the process of photosynthesis.







INTERDEPENDENCE BETWEEN PLANTS AND ANIMALS

Animals depend on the plants for oxygen and food. Animals use oxygen to breathe and food for energy. Animals give out carbon dioxide which is used by the plants for producing food. Plants are also dependent on







animals for pollination of flowers and germination of seeds. Insects and birds help in the pollination and germination of seeds.



BALANCE IN NATURE

Balance in nature is very important. It is very important to maintain a balance between plants and animals. What will happen if the number of animals increase than that of the plants? Plants will not be able to fulfil the needs of food and oxygen. On the other hand if plants increase in number, then carbon dioxide generated by animals will not be sufficient for the plants. To maintain a balance, it is very important to protect both plants and animals. It is required to grow more plants. Programme like Van Mahotsava







makes people aware of the importance of trees. There are movements like Chipko Movement, to save the trees. Under wildlife protection programmes, wild animals are given protection, in national parks and sanctuaries.



Fact File

- Aquatic plants like hydrilla increase the oxygen content of water and remove carbon dioxide from it.
- The bottle tree which is found in the desert areas, has a trunk, shaped like a bottle.



Things to Remember

- All green plants prepare their own food.
- Leaves are the food factories of the plants.
- Leaves contain a green pigment called chlorophyll that helps in the preparation of food.
- Leaves prepare food with the help of water, carbon dioxide and sunlight, in the presence of chlorophyll. This process is known as photosynthesis.

