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Science

Class VII


Based on Latest NCERT Textbook

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Syllabus

No.	Chapter/Unit	Objectives
1.	Nutrition in Plants	To study different modes of nutrition in plants according to their needs.
2.	Nutrition in Animals	To study different type of nutrition in animals with respect to their digestive techniques.
3.	Heat	To understand basics of heat transfer, conduction, convection and radiation.
4.	Acids, Bases and Salts	To study the importance of acids, bases and salts in our day to day lives.
5.	Physical and Chemical Changes	To enable the students to differentiate between physical and chemical changes.
6.	Respiration in Organisms	To study the importance of respiration and the steps involved in various organisms.
7.	Transportation in Animals and Plants	To understand the Human Circulatory and Excretory System and types of Vascular tissues in plants.
8.	Reproduction in Plants	To study various modes of reproduction in plants, i.e. Sexual and Asexual.
9.	Motion and Time	To be able to analyse motion and understand the graphical representations.
10.	Electric Current and its Effects	To explain the effects of electric current in daily use appliances.
11.	Light	To learn the image formation by spherical mirrors and lens.
12.	Forests : Our Lifeline	To make students understand the role and uses of forests.
13.	Wastewater Story	To acquaint with various treatment techniques of wastewater to be used purposely.



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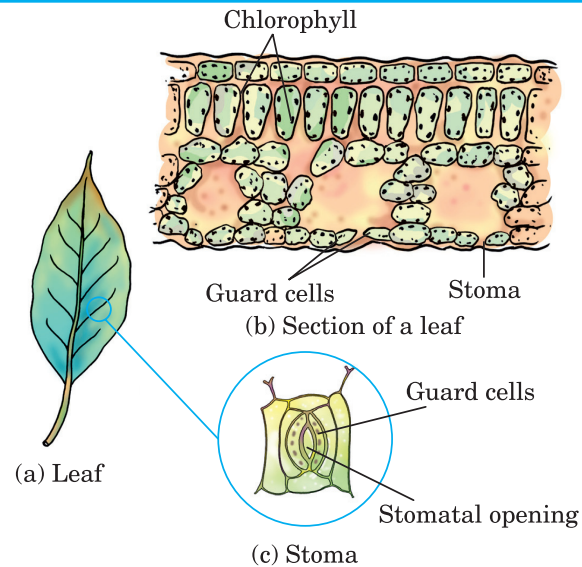
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CHAPTER

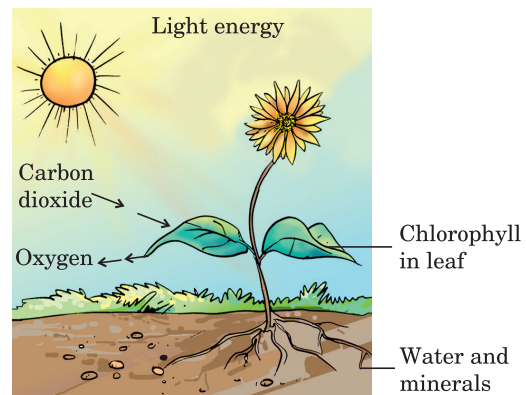
Nutrition in Plants

Summary

- Carbohydrates, proteins, fats, vitamins and minerals are components of food. These components of food are called nutrients and are necessary for our body.
- All living organisms require food. Plants can synthesise food for themselves but animals including humans cannot. They get it from plants or animals that eat plants.
- Plants are the only organisms that can prepare food for themselves by using water, carbon dioxide and minerals.
- The nutrients enable living organisms to build their bodies, to grow, to repair damaged parts of their bodies and provide the energy to carry out life processes.
- Nutrition is the mode of taking food by an organism and its utilisation by the body.
- The mode of nutrition in which organisms make food themselves from simple substances is called autotrophic (auto = self; trophos = nourishment) nutrition.
- Animals and most other organisms take in food prepared by plants. They are called heterotrophs (heteros = other).
- Leaves are the food factories of plants. Therefore, all the raw materials must reach the leaf. Water and minerals present in the soil are absorbed by the roots and transported to the leaves.
- Carbon dioxide from air is taken in through the tiny pores present on the surface of leaves. These pores are surrounded by 'guard cells'. Such pores are called stomata.

**Fig.**

- Water and minerals are transported to the leaves by the vessels which run like pipes throughout the root, the stem, the branches and the leaves.
- The leaves have a green pigment called chlorophyll. It helps leaves to capture the energy of the sunlight.
- Since the synthesis of food occurs in the presence of sunlight, it is called photosynthesis.
- Chlorophyll, sunlight, carbon dioxide and water are necessary to carry out the process of photosynthesis.
- The solar energy is captured by the leaves and stored in the plant in the form of food. Thus, Sun is the ultimate source of energy for all living organisms.
- The presence of starch in leaves indicates the occurrence of photosynthesis.
- The carbohydrates are made of carbon, hydrogen and oxygen.
- Soil has certain bacteria that convert gaseous nitrogen into a usable form and release it into the soil. These are absorbed by the plants along with water.
- Plants like *Cuscuta* are parasites. They take food from the host plant.
- There are a few plants which can trap insects and digest them.
- Such insect-eating plants are called insectivorous plants.

**Fig : Diagram showing photosynthesis**

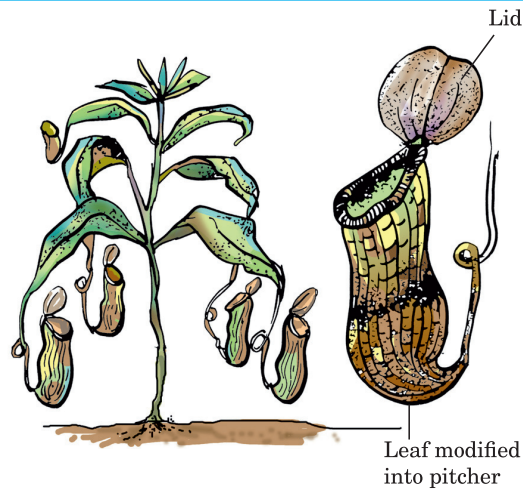


Fig. : Pitcher plant showing lid and pitcher

- This mode of nutrition in which organisms take in nutrients from dead and decaying matter is called saprotrophic nutrition. Such organisms with saprotrophic mode of nutrition are called saprotrophs.
- Fungi also grow on pickles, leather, clothes and other articles that are left in hot and humid weather for long time.
- The fungal spores are generally present in the air. When they land on wet and warm things they germinate and grow.
- Many fungi like yeast and mushrooms are useful, but some fungi cause diseases in plants, animals including humans. Some fungi are also used as medicines.
- Some organisms live together and share both shelter and nutrients. This relationship is called symbiosis. For example – Certain fungi live inside the roots of plants. The plants provide nutrients to the fungus and, in return, the fungus provides water and certain nutrients.
- In organisms called lichens, a chlorophyll-containing partner, which is an alga, and a fungus live together.
- Fertilisers and manures contain nutrients such as nitrogen, potassium, phosphorous, etc. These nutrients need to be added from time to time to enrich the soil.
- The bacterium called Rhizobium can take atmospheric nitrogen and convert it into a usable form.
- Most of the pulses (dals) are obtained from leguminous plants.

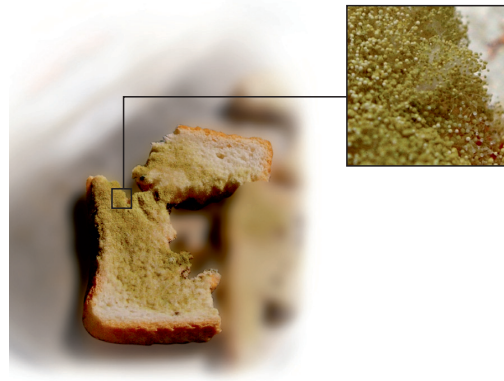


Fig. : Fungi growing on bread

- A few plants and all animals are dependent on others for their nutrition and are called heterotrophs.



KEY TERMS AND DEFINITIONS

- **Autotrophic** : The mode of nutrition in which organisms prepare their own food by the process of photosynthesis.
- **Chlorophyll** : The green coloured pigment present in the leaves.
- **Heterotrophs** : The living organisms which are dependent on others for nutrition.
- **Host** : An organism on which the other organism lives and derives nutrition.
- **Insectivorous** : Insect eating plants are called insectivorous plants. For example – Pitcher plant.
- **Nutrients** : Chemical substances that are required to obtain energy. For example – Carbohydrates, Fats, Proteins, Vitamins and Minerals.
- **Nutrition** : The process of intake of food and its utilization is called nutrition.
- **Parasite** : An organism that lives and feeds on other living organism.
- **Photosynthesis** : The process by which green plants prepare their own food using carbon dioxide and water in the presence of sunlight and chlorophyll.
- **Saprotrophs** : Organisms that grow and derive nourishment from the dead and decaying matter.
- **Saprotrophic** : The mode of nutrition in which organisms take in nutrients from dead and decaying matter.
- **Stomata** : The tiny openings on the underside of leaf that allows exchange of gases.

ACTIVITY-1.1

Page 3

- Take two potted plants of the same kind.
- Keep one in the dark for 72 hours and label it as 'A'.
- Keep other plant in the sunlight and label it as 'B'.
- Now to perform iodine test, remove a green leaf from plant 'B' and put it in a ethanol containing test tube.
- Now heat the test tube until alcohol begins to boil.

- The leaf becomes colourless and then wash it properly with water.
- Now pour some drops of iodine solution on the leaf.
- It is observed that the leaf becomes blue-black due to the presence of starch.
- Now perform the same experiment with leaf of plant 'A'.
- A very less appearance of blue-black colour is observed.
- Now keep the plant 'A' in the sunlight for 3-4 days and again perform iodine test on the leaf of this plant.
- This time, the appearance of blue-black colour is observed.
- Thus, it can be concluded that plants prepare carbohydrate (starch) in the presence of sunlight by photosynthesis process.

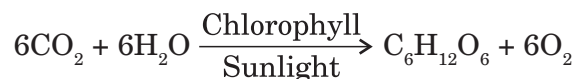
ACTIVITY-1.2**Page 6**

- Take a piece of bread and moisten it with water.
- Leave it in a moist warm place for 2–3 days.
- After three days some white, green and brown colour patches are found on it.
- Now observe these patches under a microscope or a magnifying glass.
- It is observed that some cotton like threads are spread on the piece of bread.
- These organisms are fungi which grow on the decaying piece of bread.

**INTEXT QUESTIONS****Page 1**

Q. 1. Boojho wants to know how plants prepare their own food.

Ans. Green plants can make their own food from simple substances like CO₂ and water present in the surroundings by the process of photosynthesis. In plants, water and minerals present in the soil are absorbed by roots and CO₂ is taken from air through stomata. The leaves have green pigment called chlorophyll, which helps to attain the energy from sunlight. Hence, the leaves containing chlorophyll synthesize carbohydrate in the presence of CO₂, H₂O and sunlight.



Q. 2. Paheli wants to know why our body cannot make food from carbon dioxide, water and minerals like plants do.

Ans. Our body cannot make food from carbon dioxide, water and minerals like plants do because our body has no chlorophyll which can attain the solar energy. The solar energy is used to synthesize food from CO₂ and water.