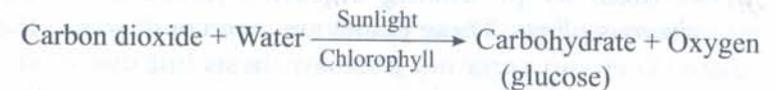


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Lesson at a Glance

- **Nutrition:** *Nutrition* is the mode of taking food by an organism and its utilisation by the body.
- **Autotrophic nutrition:** The mode of nutrition in which organisms make food for themselves from simple inorganic substances (like carbon dioxide and water) is called *autotrophic nutrition*.
- **Chlorophyll:** *Chlorophyll* is a green pigment which helps to capture the energy of the sunlight. This energy is used to synthesise (prepare) food from carbon dioxide and water.
- **Photosynthesis:** The process in which the green plants make their food in the presence of sunlight, is called *photosynthesis* (Photo: light, Synthesis: to combine).
- Chlorophyll, sunlight, carbon dioxide and water are necessary to carry out the process of photosynthesis.



- **Cell:** The bodies of living organisms are made of tiny units called *cells*. The cell is enclosed by the *cell membrane* which surrounds a jelly-like substance known as *cytoplasm*. In the cytoplasm, almost centrally placed a spherical structure called the *nucleus* is found.

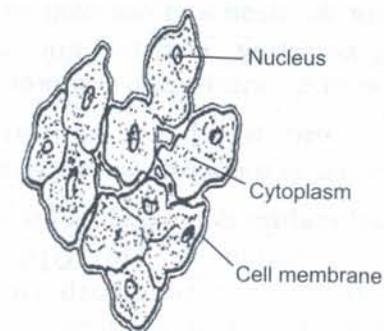


Fig. 1.1 Cell

- Almost all the living organisms directly or indirectly depend upon the food prepared by the green plants.
- **Algae:** These are aquatic lower plants which do not have differentiated stem, root and leaves. They are green in colour due to presence of chlorophyll. Algae can prepare their own food by photosynthesis.
- **Heterotrophs:** The organisms which cannot make their food and depend on others for their food (including animals and non-green plants, that take in food prepared by the green plants) are called *heterotrophs*.
- **Parasite:** The organism either plant or animal that derives nutrients from another organism without benefitting the *host* (organism from which it takes nutrients) is known as *parasite*. For example: *cuscuta* (Amarbel), lice, etc.
- **Host:** The organism, whether plant or animal, that provides nutrients to another organism or organisms known as parasites without being benefitted, is called as *host*.
- **Insectivorous plants:** The plants which trap insects and digest them by producing digestive juices are called *insectivorous plants*. These plants are green or of some other colour. They can carry out photosynthesis but they cannot obtain nitrogen rich substances from the soil. So, these plants make their own food but depend on insects for nitrogenous food. For example, *pitcher plant*, sundew and bladderwort.
- **Saprotrophic nutrition:** The mode of nutrition in which the organism digests the dead and decaying organic materials of the body by secreting enzymes and then absorb the nutrients in solution form is called *saprotrophic nutrition*.
- **Saprotrophs:** Plants which use saprotrophic mode of nutrition are called *saprotrophs* (saprophytes).
- **Symbiotic relationship:** Some organisms live together and share shelter and nutrients. This type of relationship between organisms in which both the partners are benefitted by each other is called *symbiotic relationship*. For example, *lichens* have a fungus partner and algal partner.

The fungus partner provides shelter, water and mineral to the alga. In return, the alga provides food which it prepares by photosynthesis.

- **Nutrients:** The components of food which are essential for our body, or any other organism for growth and development, are called *nutrients*.
- **Stomata:** There are tiny pores present on the surface of the leaves for exchange of gases from atmosphere. Each pore is called *stoma* (**stomata** plural of stoma) and is surrounded by *Guard Cells*.
- Water and minerals are transported from roots to the leaves by the vessels which run like pipes throughout the roots, the stem, the branches and the leaves.
- Soil has certain bacteria that convert gaseous nitrogen into usable form and release it into the soil. From soil, plants take up this usable nitrogen for synthesis of proteins.

■ TEXTBOOK QUESTIONS SOLVED ■

Q.1. *Why do organisms need to take food?*

Ans. Food is needed by all organisms for many purposes:

- (a) The main function of food is to help in growth.
- (b) Food provides energy for movements such as running, walking or raising our arm.
- (c) Food is also needed for replacement and repairing damaged parts of body.
- (d) Food gives us resistance to fight against diseases and protects us from infections.

Q.2. *Distinguish between a parasite and a saprotroph?*

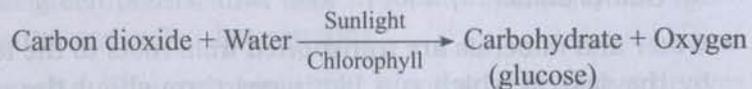
Ans.	Parasite	Saprotrophs
(i)	Parasite feeds on a living organism.	(i) They feed on dead and decaying organism.
(ii)	The organism on which it feeds is called host.	(ii) They do not feed on a living organism.
(iii)	A parasite takes ready-made food from the organism on which it feeds.	(iii) They secrete digestive juices on the matter they live and convert it into a solution and then absorb it.

Q.3. How would you test the presence of starch in leaves?

Ans. The presence of starch in leaves can be tested by Iodine test. When we remove chlorophyll from leaf by boiling it in alcohol and then put 2 drops of iodine solution, its colour change to blue indicates the presence of starch.

Q.4. Give a brief description of the process of synthesis of food in green plants.

Ans. The green plants have chlorophyll in the leaves. The leaves use CO_2 and water to make food in presence of sunlight.



During photosynthesis oxygen is released.

Q.5. Show with the help of a sketch that the plants are the ultimate source of food.

Ans.

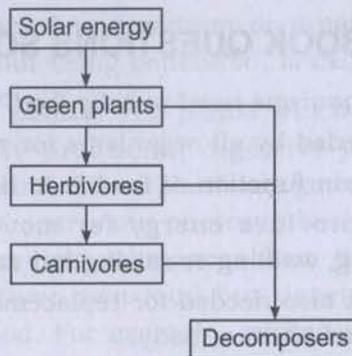


Fig. 1.2 Sketch to show that plants are the ultimate source of food.

Q.6. Fill in the blanks:

- Green plants are called _____ since they synthesise their own food.
- The food synthesised by the plants is stored as _____.
- In photosynthesis solar energy is captured by the pigment called _____.

(d) During photosynthesis plants take in _____ and release _____.

Ans. (a) autotrophs (b) starch
(c) chlorophyll (d) carbon dioxide, oxygen

Q.7. Name the following:

- A parasitic plant with yellow, slender and tubular stem.
- A plant that has both autotrophic and heterotrophic mode of nutrition.
- The pores through which leaves exchange gases.

Ans. (i) *Cuscuta* (ii) Insectivorous plant
(iii) Stomata

Q.8. Tick the correct answer:

- Amarbel is an example of:
 - Autotroph
 - Parasite
 - Saprotroph
 - Host
- The plant which traps and feeds on insects is:
 - Cuscuta*
 - China rose
 - Pitcher plant
 - Rose

Ans. (a) (ii) Parasite (b) (iii) Pitcher plant

Q.9. Match the items given in Column I with those in Column II:

Column I	Column II
Chlorophyll	Bacteria
Nitrogen	Heterotrophs
Amarbel	Pitcher plant
Animals	Leaf
Insects	Parasite

Ans.

Column I	Column II
Chlorophyll	Leaf
Nitrogen	Bacteria
Amarbel	Parasite
Animals	Heterotrophs
Insects	Pitcher plant

Q.10. Mark 'T' if the statement is true and 'F' if it is false:

- (i) Carbon dioxide is released during photosynthesis. (T/F)
- (ii) Plants which synthesise their food themselves are called saprotrophs. (T/F)
- (iii) The product of photosynthesis is not a protein. (T/F)
- (iv) Solar energy is converted into chemical energy during photosynthesis. (T/F)

Ans. (i) F (ii) F (iii) T (iv) T

Q.11. Choose the correct option from the following?

Which part of the plant takes in carbon dioxide from the air for photosynthesis?

- (i) Root hair (ii) Stomata
- (iii) Leaf veins (iv) Sepals

Ans. (ii) Stomata

Q.12. Choose the correct option from the following:

Plants take carbon dioxide from the atmosphere mainly through their:

- (i) Roots (ii) Stem
- (iii) Flowers (iv) Leaves

Ans. (iv) Leaves

EXTENDED LEARNING — ACTIVITIES AND PROJECTS

Q.1. Project: Take a potted plant with broad leaves. Take two strips of black paper and cut out a small square in their centres. Cover a part of two leaves with these papers and secure them with paper clips (Fig. 1.3). Keep the plant in the sunlight for 2–5 days. Observe the difference in the colour of the covered and the uncovered portions on the one leaf. Perform iodine test on this leaf. Did the two parts show any difference in results? Now take second leaf. Remove the strip and expose the covered part to the sunlight for 2–3 days and do the iodine test again. Describe your observations.



Fig. 1.3 Experiment to test the occurrence of photosynthesis.

Ans. Only the uncovered part becomes blue-black on treatment with iodine solution, that shows presence of starch.

When iodine test is performed on the second leaf, after exposing the covered to the sunlight for 2–3 day, the whole portion shows presence of starch.

These observations lead us to conclude that light is necessary for photosynthesis.

Q.2. Visit a green house if there is one near your place. Observe how they raise plants. Find out how they regulate the amount of light, water and carbon dioxide to grow the plants.

Ans. Green house is a glass building in which plants are kept to protect them from cold weather. They are usually made in colder regions.

Visit a green house alongwith your teacher or parents if there is one near your place.

Q.3. Try growing a sweet potato just in water. Describe your experiment and observations.

Ans. Take a big beaker or a glass tumbler three-fourth filled with water. Put a small sweet potato in it. See that sweet potato completely dip into the water. After 4–5 days, you may observe that the sweet potato starts decaying.