

Class 07 Chapter 01 Nutrition in Plants

Food: Food is fuel for all living organisms. It is because food provides energy to all living organisms to do their life activities. Food also helps them to grow and build their bodies

The chemicals present in food are called **Nutrients** like protein , vitamin, carbohydrates etc(read class 6 book)

Green plants can make their own food by using water and carbon dioxide. Animals cannot make their own food. They depend on plants directly or indirectly for their food.

The mode of taking food by an organism and utilizing it by the body is called **nutrition**.

There are two modes of nutrition in organisms. They are autotrophic and heterotrophic nutrition

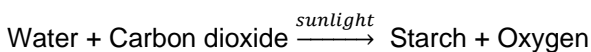
The mode of nutrition in which organisms make their own food is called Autotrophic Nutrition and such organisms are called autotrophs. eg. Green plants.

The mode of nutrition in which organisms depend on others for their food, is called **Heterotrophic Nutrition** and those organisms are called heterotrophs. eg. All animals, including human beings.

PHOTOSYNTHESIS: The process of preparing food with the help of water, carbon dioxide, sunlight and chlorophyll in plants is called photosynthesis. Chloroplast is the site of Photosynthesis. Chloroplast contain chlorophyll that contain green pigment that trap sunlight.

Think: The sun is the ultimate source of energy for all forms of life ?

Photosynthesis can be represented by the equation given below



Chloroplast and the Process of Photosynthesis

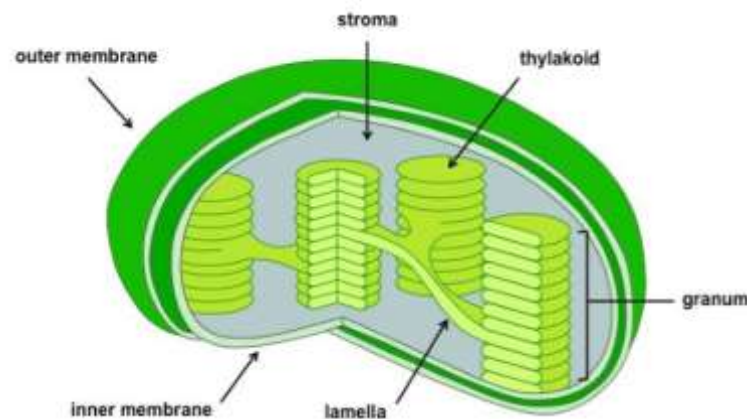


Figure 7: Structure of Chloroplast

- Chloroplasts are special cell organelles that are found only in plant cells. They are called the food producers of the plant cells.
- The chloroplasts are surrounded by two membranes called the **Inner and Outer Membrane**. The inner membrane surrounds **stroma** and **thylakoid** stacks.
- The chlorophyll molecules are present on each of the thylakoids. The chloroplasts convert the sunlight into sugars that are used by the plant cells.
- Hence, chloroplasts allow the conduction of the process of photosynthesis. The **chlorophyll** that can absorb the sunlight is present inside the chloroplasts.

- When the light of the sun hits the chloroplasts and the chlorophyll, the light energy is converted into chemical energy found in compounds such as ATP and NADPH.
- Then these energy molecules move into the stroma where carbon dioxide is attached to them. As a result of the molecular reactions, oxygen and glucose are created.

Can leaves which are red or Brown or violet in colour conduct photosynthesis?

Yes, the chlorophyll is also present in leaves that are not green in color. They are of different colours because the other colour pigments are more than the green colour pigments in such leaves.

Algae contain chlorophyll

Algae are green coloured organisms found in the stagnant water. They get their green color from chlorophyll. Since they have chlorophyll in them they are capable of conducting photosynthesis.)

How do plants generate proteins and fats?

- Along with carbohydrates, plants can also produce proteins and fats which are formed with the help of Nitrogen.
- Nitrogen is present in large amounts in the air but plants cannot consume the nitrogen directly from the atmosphere.
- The soil often contains some bacteria that are capable of converting the nitrogen into nitrates which can be used by the plants.
- Also, fertilizers used by farmers and gardeners contain a high amount of Nitrogen which mixes into the soil and is used by the plants.

Self Assignment: 01

1. Define food?
2. why is food essential for us?
3. What is nutrients?
4. Define : Nutrition and its types
5. Define stomata? Write its function.
6. write chemical equation for photo synthesis?
7. Reason: Leaves of plants show different colours other than green ?

OTHER MODES OF NUTRITION IN NON GREEN PLANTS

Parasitic Nutrition: The mode of nutrition in which non green plants gets nutrition from other green plants is called Parasitic Nutrition for example cuscuta . It cannot synthesize food. As it lacks chlorophyll, The plant which provides food is called host and the plants which consumes it is called parasite.

Saprotrophic nutrition: The mode of nutrition in which organism get nutrition from dead and decaying matter is called Saprotrophic nutrition and those plants are called saprotrophs. eg: mushroom, bread mould.

Saprophytes like fungi grow on dead organic matter. They produce digestive enzymes on the dead matter and change it into simple soluble form and absorb the nutrients and utilize it.

Insectivorous Plants : Some plants eat insects because their soil does not have certain nutrients like nitrogen for them to grow. They are called Insectivorous Plants like venus fly trap, pitcher plant.

Symbiosis: The mode of nutrition in which two different organisms live together help each other for nutrition is called symbiosis. The organisms are called symbionts. For example Lichens are organisms that consist of a fungus and alga. The algae gives food to the fungus and the fungus absorbs water and minerals and gives to algae.

Replenishing the Soil with Nutrients

- Plants get their nutrients from the soil mainly hence there is a need to replenish the soil again with nutrients so that the plants can survive on it.

- Fertilizers and manure are often used to replenish the soil with the nutrients. They contain potassium, phosphorus and nitrogen all of which are important for the plants.
- A bacterium called Rhizobium is present in the soil which can convert nitrogen present in it in the form that can be consumed by the plants.
- The rhizobium generally lives in the roots of the plants such as peas, beans, grams and legumes and provides nitrogen to these plants. This again is an example of a symbiotic relationship. The farmers often do not need to use fertilizers while growing such crops

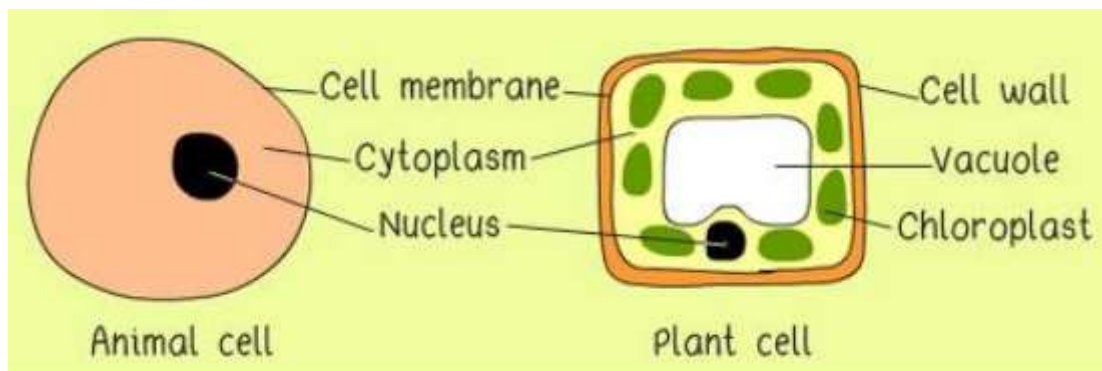
Self Assignment - 02

1. What are the living organisms that cannot make their own food called?
2. What are the structures in cells that contain chlorophyll called?
3. What does 'photo' in photosynthesis refer to?
4. Which bacteria in the soil can convert atmospheric nitrogen into soluble compounds?
5. What type of plant is Cuscuta?
6. What do you call a mutually beneficial relationship between two living organisms?
7. Which organism gets its food from dead and decaying matter?
8. To which colour does starch turn to when iodine is added to it?
9. What is the ultimate source of all the energy needs of our body?
10. Why is nitrogenous fertilizer not added in soil in which leguminous plants are grown?

Cells in Living Organisms

All living organisms are made up of tiny structures called cells. Some organisms (microscopic) contains only one cell while others plants and animals contain many cells of different kinds. Parts of a cell:

- **The Nucleus** - Every cell has a nucleus present in the centre that performs various functions of the cell.
- **The Cell Membrane** - Every cell has an outer boundary which protects the cell called the **Cell Membrane**.
- **The cytoplasm** - Every cell has a gel-like structure present in it called the **Cytoplasm**.
- **Cell organelles:** These are membrane bound structures found within a cell in the cytoplasm. The cell organelles have special function associated with them. Different cell organelles found in the cell are:
 - **Mitochondria** – Produces energy for the cell
 - **Endoplasmic Reticulum** – Produces lipids and proteins in cell
 - **Golgi apparatus** – Helps in exporting materials out of cell
 - **Lysosomes** – Help in digestion in the cell



Structure of Cell in Animals and Plants