

# SCIENCE

## Chapter-1: Nutrition in Plants



## Nutrition in Plants

### What is Nutrition?



- **Nutrition** is the mode of taking in food by an organism and its utilisation by the body.
- **Nutrients in animal** - These are the substances required by our body for its growth, repair, work and maintenance of the body. Different types of nutrients are carbohydrates, fats, proteins, vitamins, minerals etc. Our daily energy need may vary according to our occupation, age, sex and under some specific conditions.
- The nutrients present in the food help living organisms to build their body and to grow and repair damaged parts of the body.

### Modes of Nutrition

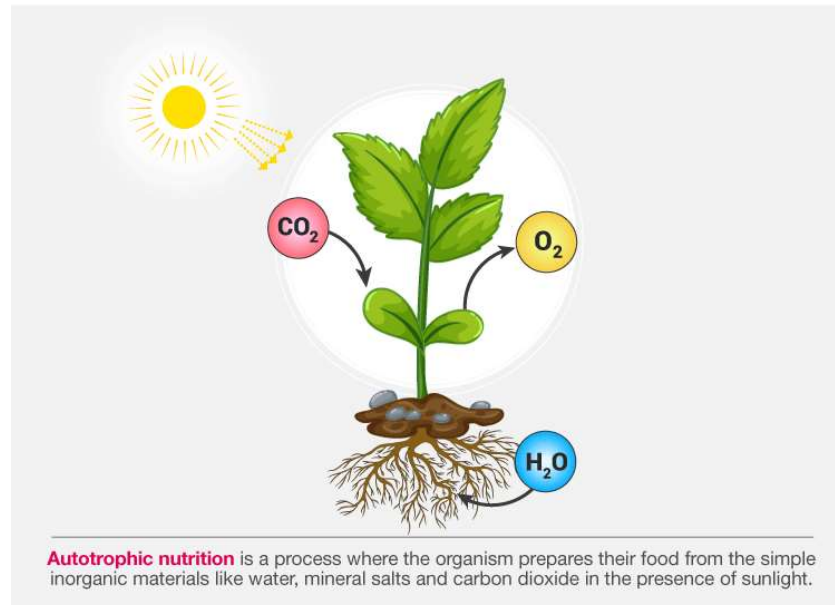
#### Autotrophic nutrition

Autotrophs can prepare their own food.

#### Heterotrophic nutrition

Heterotrophs cannot prepare their own food.

### Autotrophic

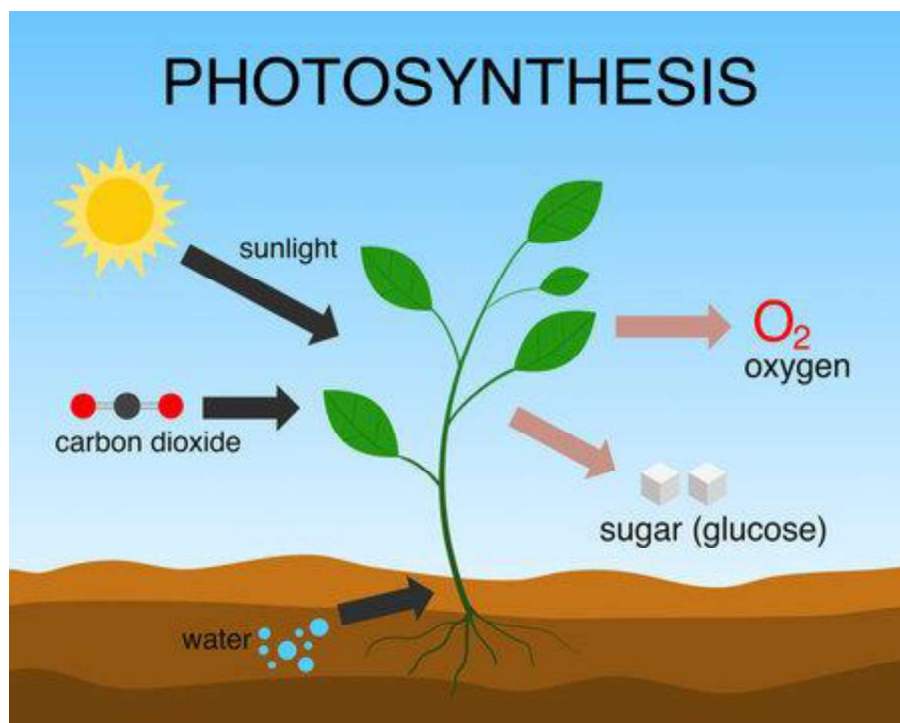


It is a mode of nutrition in which organisms prepare their own food. Inorganic molecules like  $\text{CO}_2$  and  $\text{H}_2\text{O}$  are converted into organic molecules like carbohydrates in the presence of sunlight and chlorophyll.

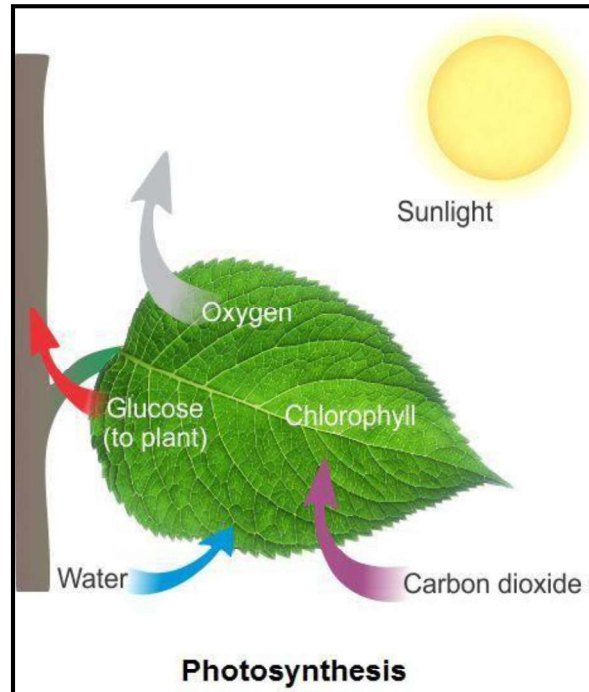
E.g. Green plants. Autotrophs are further categorized as:

- **Photoautotrophs:** Those which utilize sunlight for preparing their food e.g. green plants.
- **Chemoautotrophs:** Those which utilize chemical energy for preparing their food, e.g. Purple sulphur bacteria.

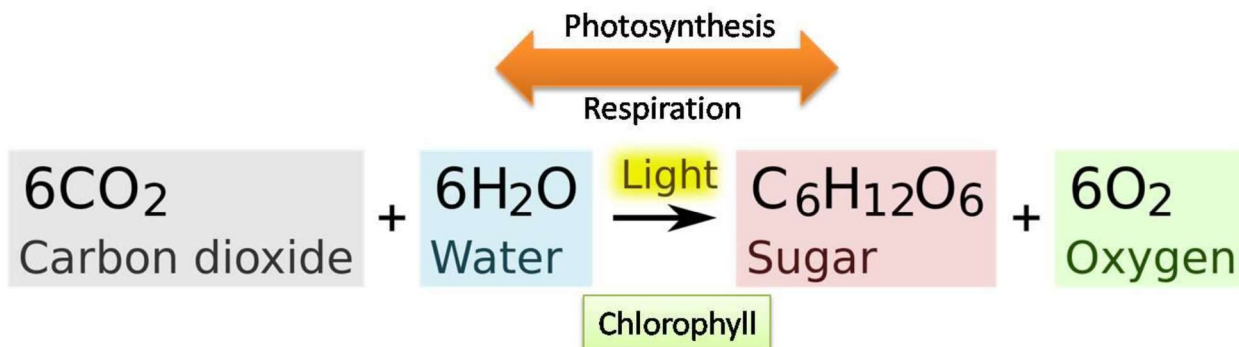
## Photosynthesis



- Plants prepare their own food in the presence of sunlight and the green pigment chlorophyll by a process termed as **photosynthesis**.
- The process of photosynthesis requires **carbon dioxide, water, minerals, sunlight** and **chlorophyll**.



- During photosynthesis, chlorophyll containing cells of leaves use carbon dioxide and water in the presence of sunlight to synthesise **carbohydrates** along with the release of **oxygen**.
- Carbohydrates ultimately get converted to **starch**, and hence, the presence of starch in leaves indicates the occurrence of photosynthesis.



### Importance of Photosynthesis

- Photosynthesis is a unique process where solar energy captured by leaves is stored as food in plants.
- The oxygen released in the atmospheric air during photosynthesis is useful because oxygen

is required by all living beings including plants.

### Synthesis of Plant food other than Carbohydrates

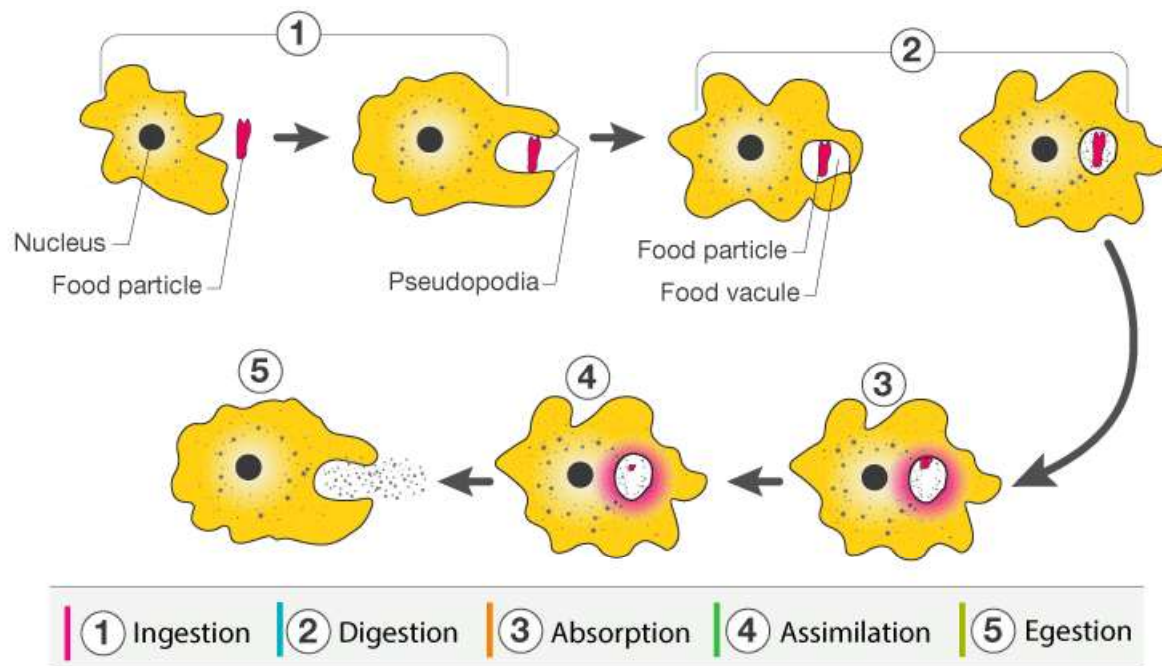
- The soil contains some nitrogen-fixing bacteria which convert gaseous nitrogen into a more usable form and release it into the soil.
- These bacteria are present in the root nodules of leguminous plants.  
Example: **Rhizobium** is usually found in the roots of gram, peas, moong and other legumes.
- The plants provide food and shelter to the bacteria, and in return, the bacteria fix nitrogen for the plants.



- Certain plants convert carbohydrate into **oils** and store them in seeds. Example: Sunflower seeds. The oil obtained from plant seeds is commonly known as vegetable oil.
- **Vitamins** made by plants are contained in vegetables, fruits and cereals.
- Plants combine some of the carbohydrate (made during photosynthesis) with nitrate minerals (obtained from soil) to make **amino acids** which are then made into proteins.

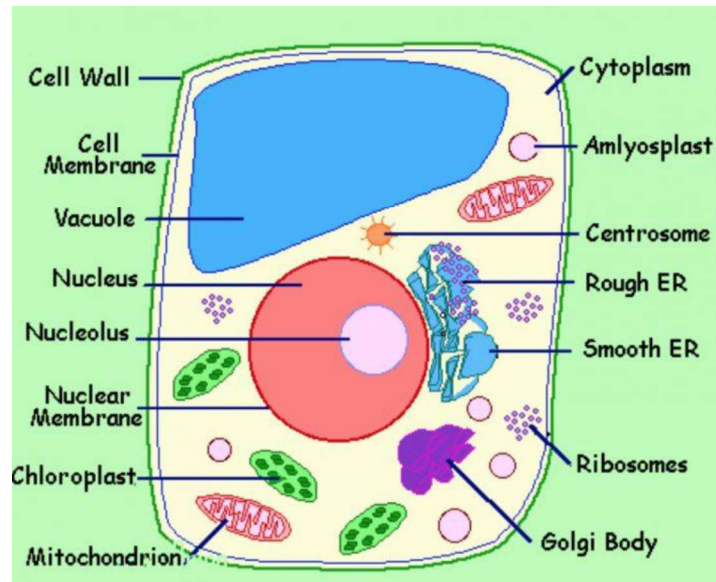
### Other Modes of Nutrition in Plants

- Some plants lack chlorophyll and hence, are unable to prepare their own food. This type of nutrition is termed as **heterotrophic** nutrition. Examples: Humans and all animals.



Types of Heterotrophic Nutrition	Examples
Parasitic	<u>Cuscuta plant</u> <ul style="list-style-type: none"> <li>It does not have chlorophyll and consumes food prepared by other plants.</li> </ul>
Insectivorous	<u>Pitcher plant</u> <ul style="list-style-type: none"> <li>It traps insects inside its pitcher and eats them.</li> </ul>
Saprophytic	<u>Fungi</u> <ul style="list-style-type: none"> <li>These organisms take in nutrients from dead and decaying matter.</li> </ul> <u>Mushroom</u> <ul style="list-style-type: none"> <li>It takes nutrition from rotting wood of a dead tree.</li> </ul>
Symbiotic association	<u>Lichen</u> <ul style="list-style-type: none"> <li>Lichens are a symbiotic association between algae and fungus.</li> <li>The fungus provides shelter, water and minerals to the alga, which in return provides food to the fungus.</li> <li>Algae contain chlorophyll and hence, are able to prepare food.</li> </ul>

### Replenishment of Nutrients in Soil



- Plants use nutrients available in the soil. Due to this, the amount of nutrients keeps declining in the soil.
- **Fertilisers** and **manures** which contain phosphorus, potassium, nitrogen etc. are constantly added to the soil from time to time to enrich the soil.
- Gardeners also use fertilisers in lawns and potted plants.
- Two common types of fertilisers are **NPK** (Nitrogen, Phosphorus and Potassium) and **Urea**.
- In addition, the association between nitrogen-fixing bacteria and plants provides nitrogen, and hence, farmers need not add nitrogen fertiliser to the soil where leguminous plants grow.

Class : 7th Science  
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