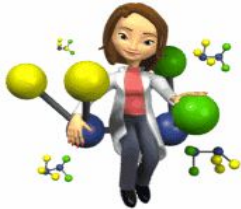


Oxford International School

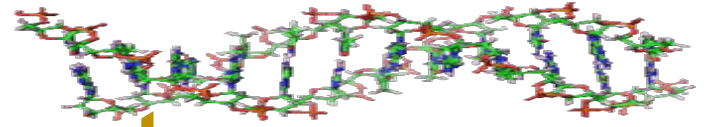
In the service of



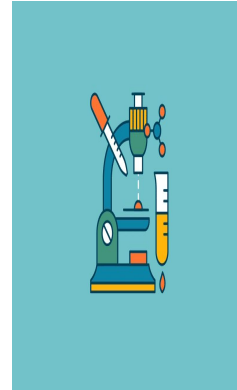
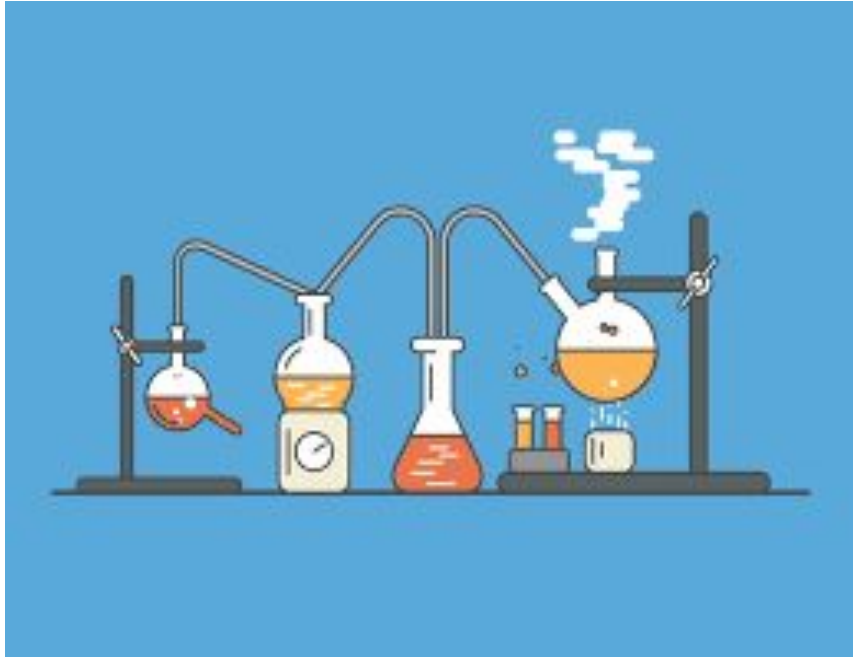
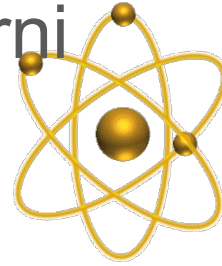
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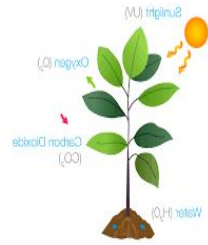
By Science Department



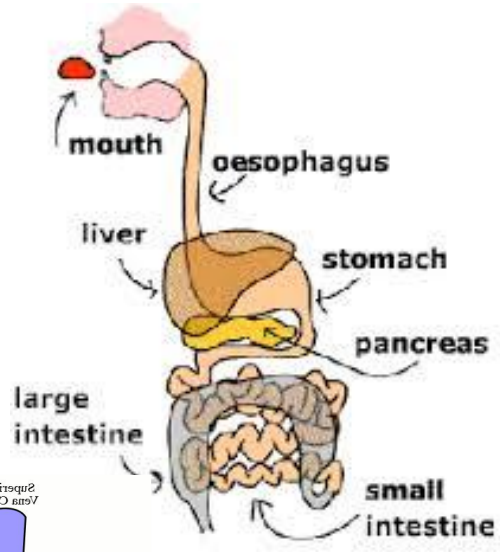
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Chapter -6



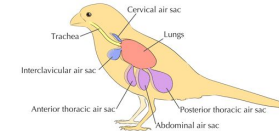
Life



Avian Respiration

Birds have a unidirectional respiratory system. Their lungs do not expand contract as in mammals and reptiles. Instead they have expandable air sacs pull air in a one-way circuit. The sacs do not perform gas exchange, but lungs are highly efficient.

1. Inhalation 1: Air sacs expand. Air is drawn into the posterior sacs.
2. Exhalation 1: Air sacs compress. Air is pushed into lungs.
3. Inhalation 2: Air sacs expand. Air in lungs is drawn into anterior sac
4. Exhalation 2: Air sacs compress. Air is exhaled.



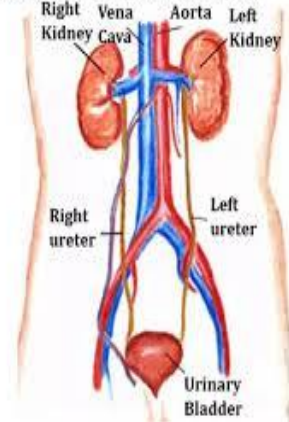
This system allows the lungs to have a constant stream of oxygen to fulfil metabolic needs of flight.

Alithographica

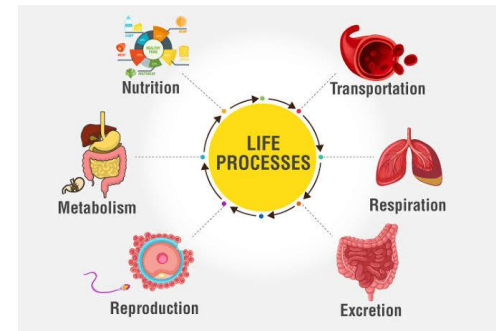
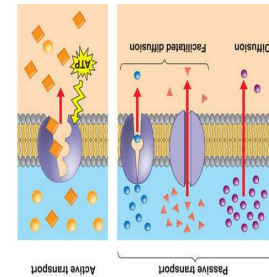
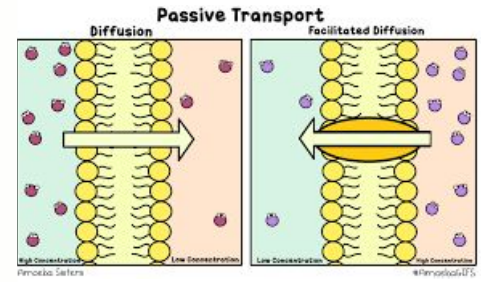
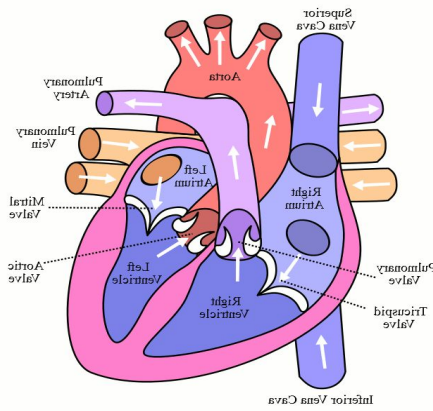
Reference: <http://people.ala.edu/~ethom/teaching/biology>

Excretory System

- Removal of waste from the body

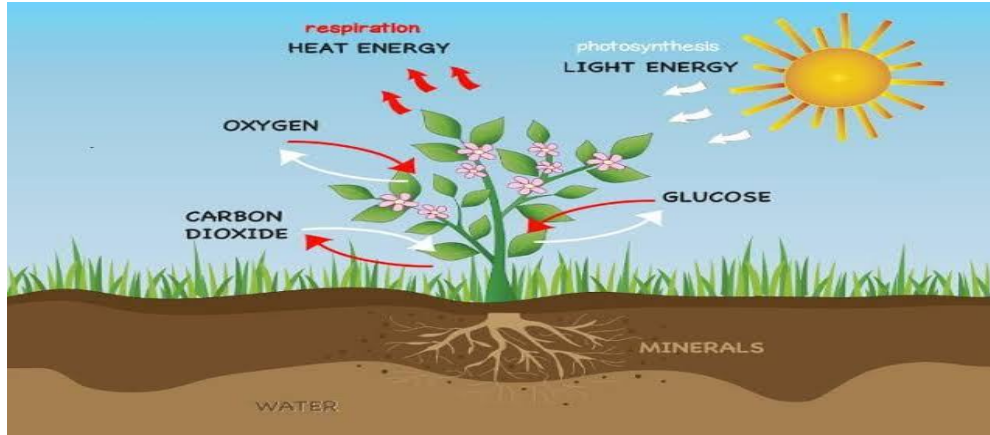
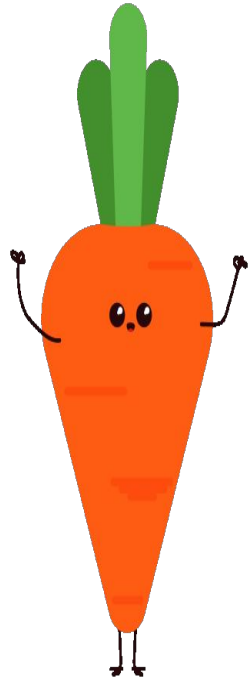


processes

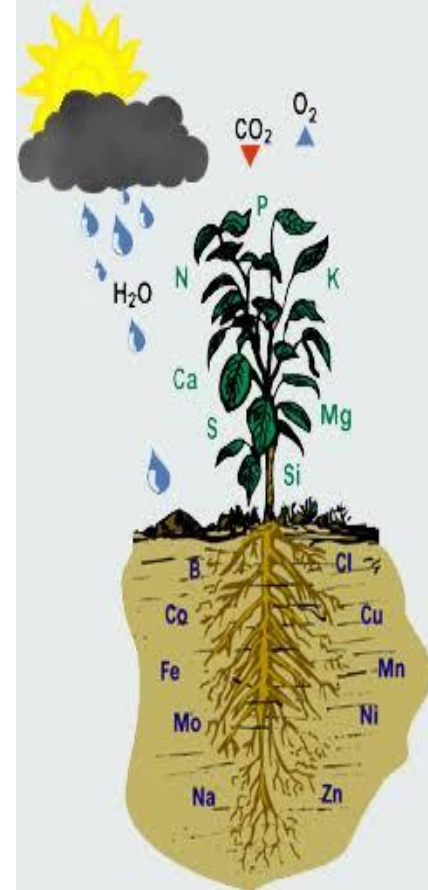


Part :

1 : NUTRITION



A) IN PLANTS



Biology : It is the science of living things. 🙄 🙄 😄 🤔

Life processes : All fundamental functions together help the living organisms to maintain their life on this earth are called as life processes. This lesson includes 4 life processes those are nutrition, respiration, transportation or circulation, excretion.

Nutrition : The process of consumption of food or nutrients and its utilisation to provide energy and conduct all metabolic activities of the organism is known as nutrition.

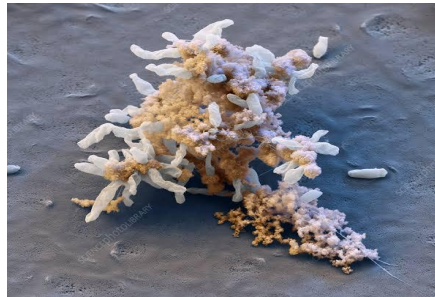
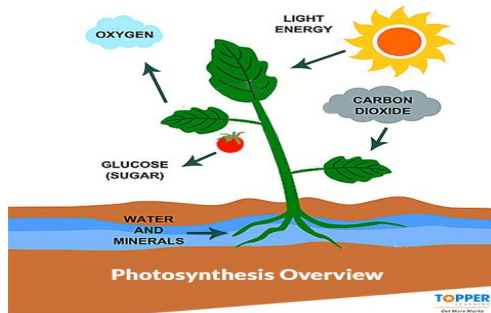


Nutrients: Any organic or inorganic substance obtained by an organism from its surroundings and uses it as a source of energy for the survival and maintenance of life is known as nutrients. Those include carbohydrates, proteins, fats, vitamins, minerals, etc.

Modes of nutrition : On the basis of their ability to obtain their own food material. Nutrition process is divided into two types : 1) Autotrophic mode of nutrition ,2) Heterotrophic mode of nutrition.

Autotrophic mode of nutrition : The mode of nutrition in which an organism produces its own food by the utilisation of only the inorganic nutrients present in the surroundings is known as autotrophic mode of nutrition.

Examples : green plants, chemosynthetic organisms.



Photosynthesis : The metabolic process in which the radiant energy is converted into chemical energy in the presence of water and carbon dioxide in green plants.

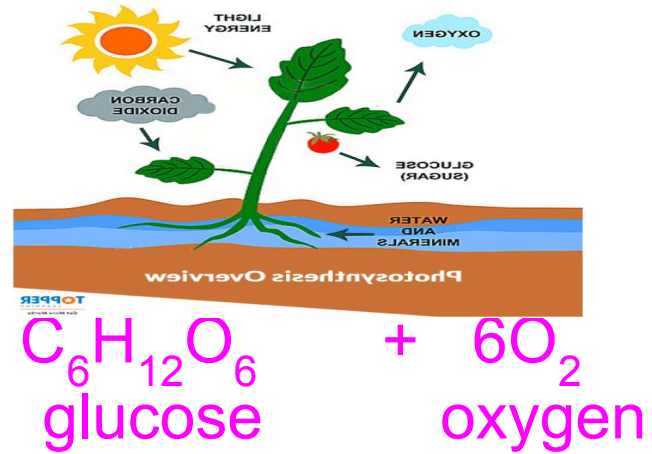
Chemical equation of photosynthesis :



Raw materials



essential factors



products

This process is possible due to chlorophyll pigments in plant parts.

Important events during photosynthesis

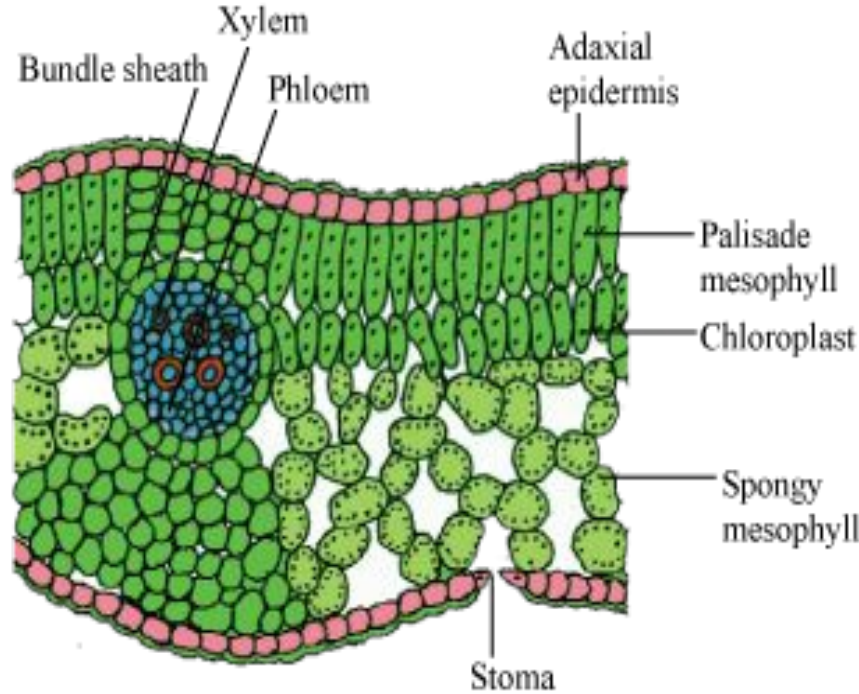
- 1) Absorption of light energy by chlorophyll.
- 2) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- 3) Reduction of carbondioxide to carbohydrates.

Site of photosynthesis :

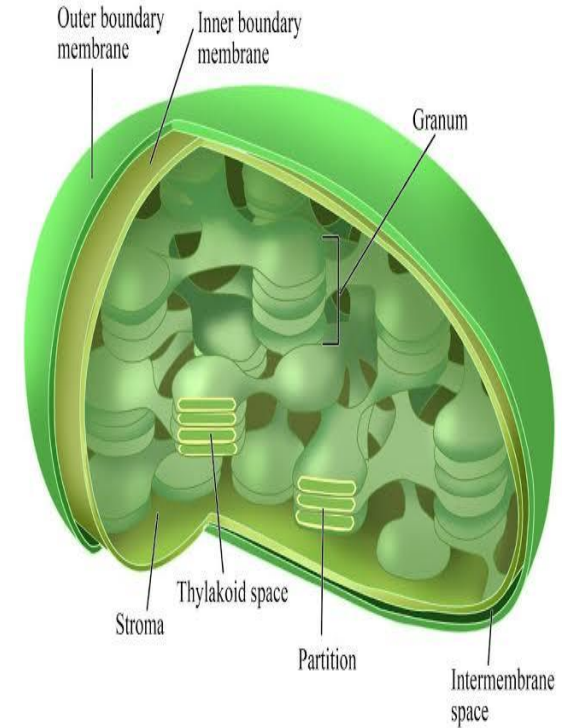
Chloroplast is the site of photosynthesis. It is present in the mesophyll tissue of leaf in large amount. Quantasomes are present in thyllakoids and are composed of chlorophyll pigments such as a,b,c,d,e. The chlorophyll pigment has tadpole structure and “a” pigment has molecular formula $C_{55}H_{72}O_5N_4Mg$. It absorbs radiations of light of wavelength of range of 400 nm to 700 nm.



Leaf



Transverse section
of leaf



ultrastructure of
Chloroplast

Raw materials for photosynthesis :

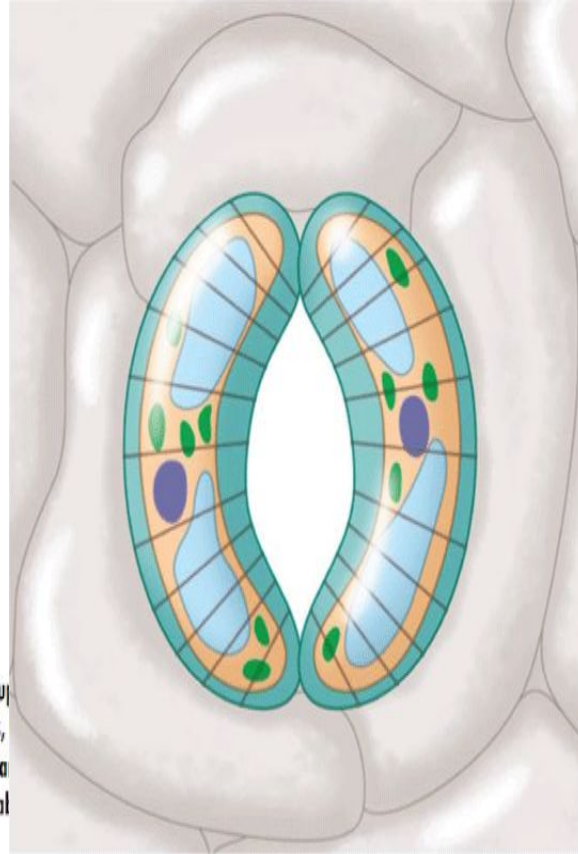
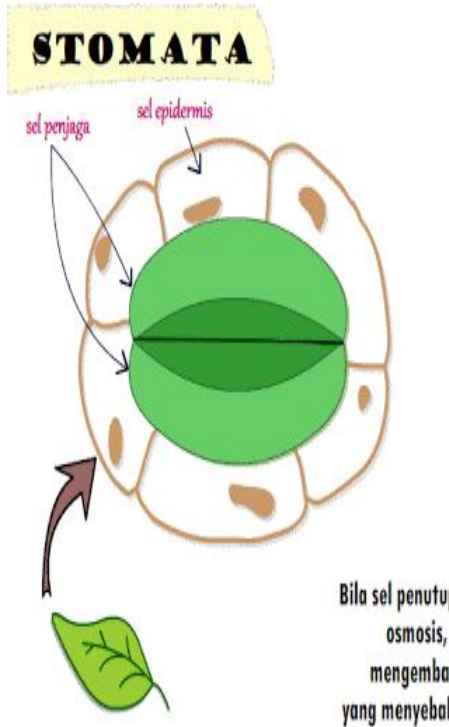
- 1) Water : It is absorbed by plant roots and transported to leaves where it is photolysed to produce electrons and protons as follows -



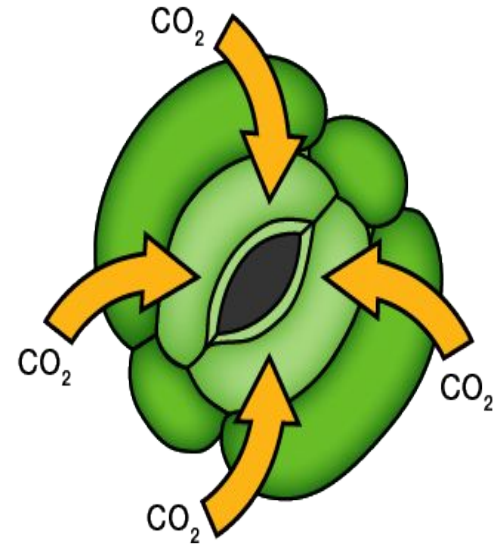
Electrons and protons pass through electron transport system to produce ATP and NADPH.

- 2) CO_2 : It is after entering the plants leaf undergoes reductive pathway where carbohydrate is synthesised during dark reaction in chloroplasts of leaves after light reaction.

Mechanism of stomata :



STOMATE = GATEWAY
for CO_2 & H_2O gas exchange

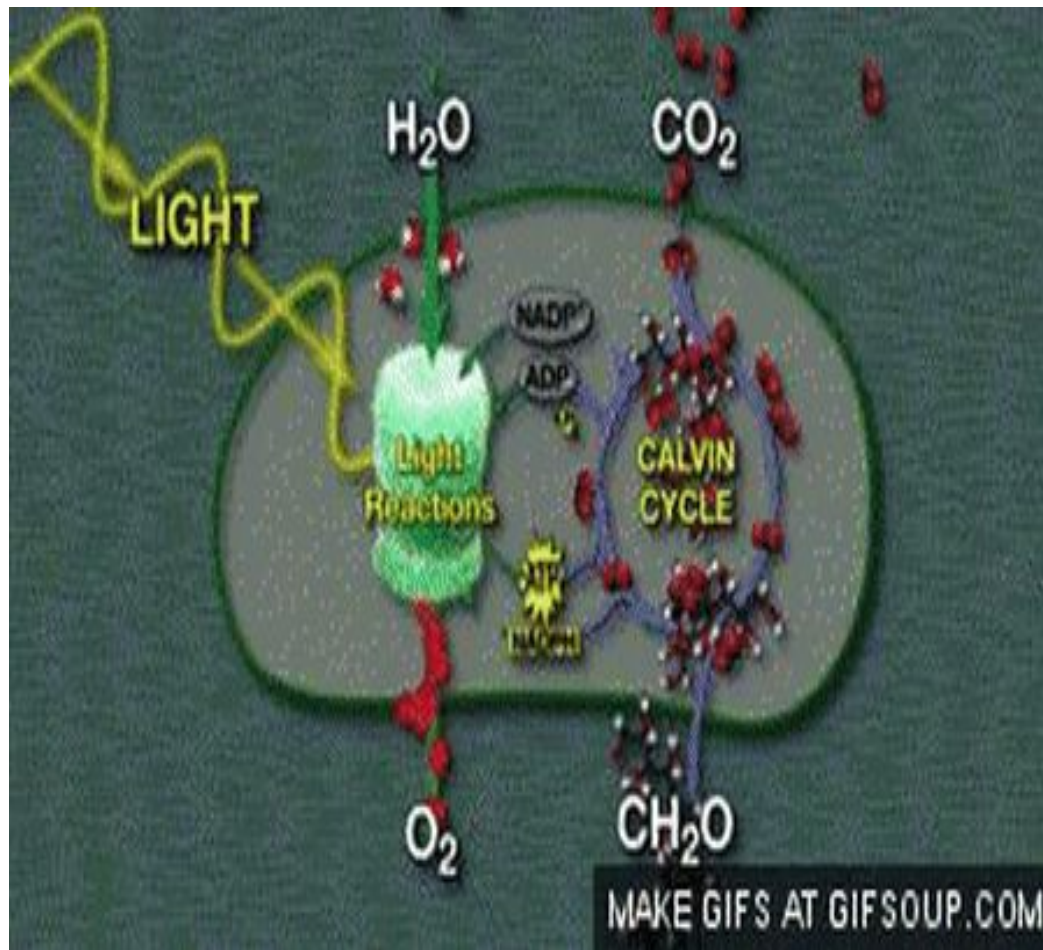


Mechanism of photosynthesis : The complete process of photosynthesis occurs under two major steps ---

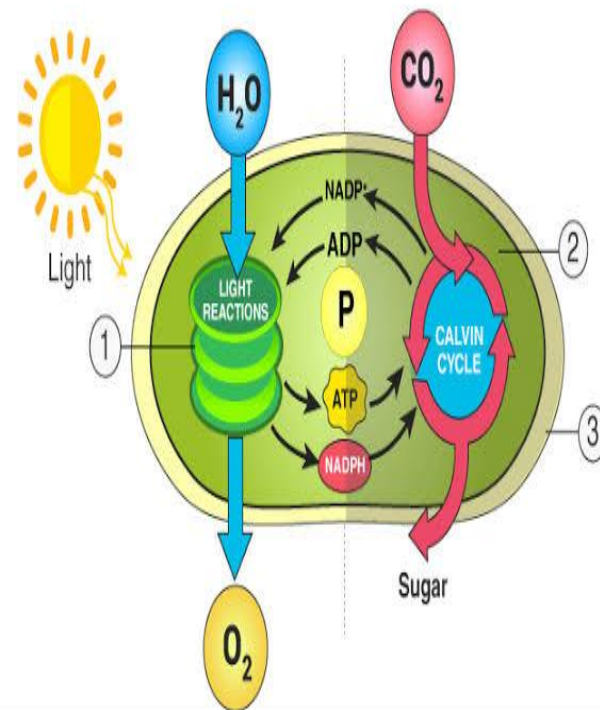
1) Light reaction : It occurs in grana of chloroplasts of leaves and completes under following steps :

- a) Excitement of chlorophyll molecules when sunlight falls on the leaves.
- b) Photolysis of water in presence of sunlight.
- c) Photophosphorylation in the presence of sunlight.

2) Dark reaction : It occurs in stroma region of chloroplast after light reaction. Here CO_2 is utilised for biosynthesis of glucose. This is called "CALVIN CYCLE".



LIGHT REACTION AND DARK REACTION



- ① Thylakoid | ② Stroma | ③ Chloroplast

Factors affecting photosynthesis : The rate of photosynthesis is affected by the following factors ---

- 1) Sunlight : The rate of photosynthesis is maximum in red and blue light .The rate of photosynthesis is low in low sunlight and increases with increase in sunlight upto certain increase later solarisation that means oxidation occurs.
- 2) Temperatures : The rate is good enough between 10° to 25° .
- 3) CO_2 : If the CO_2 level increases beyond 0.05% then photosynthesis inhibits.
- 4) Water : Water is not the limiting factor but water stress causes the stomatal closure that reduces CO_2 availability.

Reference :
G R B publication ,
Holyfaith publication,
internet



Thank you

