PHOTOSYNTHESIS

- Photosynthesis is a process in which the plants use light energy to make carbohydrate from carbon dioxide and water. The overall reaction of photosynthesis can be represented as:-

$$6CO_2 + 6H_2O \xrightarrow{sunlight+chlorophyll} C_6H_{12}O_6 + 6O_2$$

- In green plants, water undergoes oxidation to produce oxygen.
- Photosynthesis occurs in two stages, viz. light reaction and dark reaction.

CHLOROPLAST

- It acts as the site of photosynthesis.
- Chloroplast is double membraned structure.
- An aqueous fluid; called stroma is present within.
- Stacks of thylakoids are present in the stroma. A stack is called as granum.

LIGHT REACTION

- It is light-dependent.
- It occurs in thylakoids of Chloroplast.
- Light energy is captured in this stage and is utilised to make ATP and NADPH.
- It includes light absorption, water splitting, oxygen release and the formation of high-energy chemical intermediates (ATP and NADPH).
- End products are ATP and NADPH.

DARK REACTION

- It is light-independent reaction.
- Occurs in Stroma of chloroplast.
- In this, carbon dioxide is reduced to carbohydrates.
- End product is simple carbohydrate.

FACTORS AFFECTING PHOTOSYNTHESIS

- Light:- At low intensities of light, there is a linear relationship between incident light and carbon fixation but increase in incident light beyond a point results in the breakdown of chlorophyll and a decrease in photosynthesis.
- Carbon dioxide:-Increase in concentration up to 0.05% can increase carbon fixation but an increase beyond this level can be damaging over longer periods.
- Temperature:The dark reactions are controlled by temperature because they are enzymatic but Light reactions are sensitive to temperature to a much lesser extent.
- Water: The effect of water is more on the plant rather than directly on photosynthesis. Water stress results in closing of stomata and thus in reduced availability of Carbon dioxide.

Home Assignment

- Draw a well labelled diagram of Chloroplast.
- Differentiate between Light reaction and Dark Reaction.
- Explain the effect of factors affecting Photosynthesis.
- Write equation of Photosynthesis.
- Name the inorganic and organic compounds formed in this process.