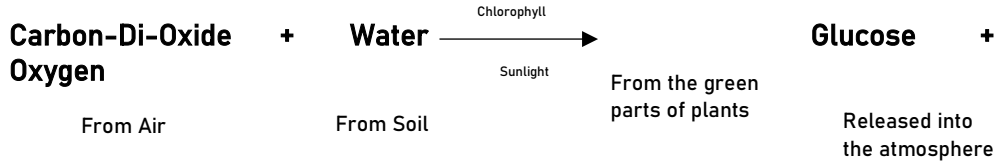
Photosynthesis

1. **What is Photosynthesis?**
   Ans. Photosynthesis is the process by which green parts of a plant make food from Carbon-Di-Oxide and water with the help of Chlorophyll and energy from sunlight



2. **How Solar energy stored in Food?**
   Ans. During photosynthesis, solar energy is trapped by chlorophyll and changed into chemical energy in the form of glucose. The glucose thus prepared, is distributed to different parts of plants.

3. **Which factors are affecting Photosynthesis?**
   Ans. The main factors which are affecting Photosynthesis are
   a. Chlorophyll
   b. Sunlight
   c. Temperature
   d. Carbon Di Oxide

4. **What are the basic processes of Photosynthesis?**
   Ans. The processes of Photosynthesis are
   i. Chlorophyll traps light or solar energy and becomes energized.
   ii. This energy is used in the splitting of water molecule into H^+ and OH^- radicals. This process is called photosynthesis of water.

$$H_2O \longrightarrow H^+ + OH^-$$

   iii. Oxygen from OH^- is released into air

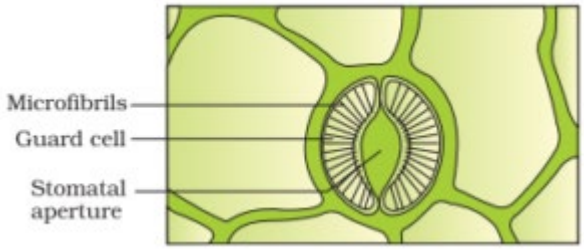
$$4OH \longrightarrow 2H_2O + O_2$$

   iv. Hydrogen combines with Carbon- Di- Oxide to form Glucose.
   v. Glucose is used by cells as source of energy and in the synthesis of starch.
   vi. Extra glucose is stored in the form starch in different parts of plants.

5. **Why maximum photosynthesis can happen in leaves?**
   Ans. Leaves have following adaptation to carry out photosynthesis
   a. All green cells have chlorophyll the photosynthesis pigment to trap solar energy.
   b. Chlorophyll is contained in the chloroplasts. So, chloroplasts are the actual sites photosynthesis in the cells.
   c. Leaves have board and flat surface to absorb sunlight and Carbon-Di-Oxide.
   d. They have arranged at right angle to the solar ray so that maximum area is exposed.
   e. Leaves have stomata for the entry of carbon dioxide needed for photosynthesis and for exist of oxygen produced during photosynthesis.
   f. The large intercellular spaces between the cells of spongy parenchyma help in easy diffuser of carbon-di-oxide.
   g. The veins in the leaves contain both xylem and phloem elements. Xylem provided water to every cell in the leaves and phloem helps ij the translocation of food from leaf to other parts of plant.

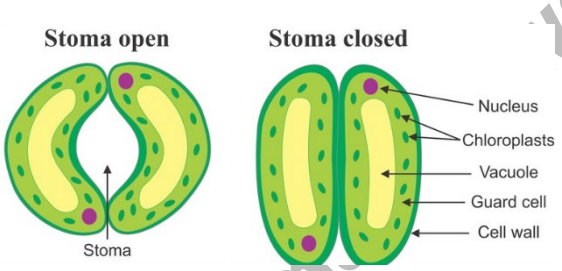
6. **What are Stomata?**
Ans. Stomata are minute pores in the epidermis of leaves. They act as passage for carbon di oxide from atmosphere into the leaf and oxygen from leaf to atmosphere.

7. **What is the structure of Stomata?**
Ans. Stomata are the tiny pores present in the epidermal surface of leaves. Two kidney-shaped cells known as guard cells, guard the pores. The inner wall of the guard cell towards the stomata is thicker as compared to the outer walls. Also, the peculiar arrangement of the microfibrils of the guard cells aids in opening and closing of the stomatal aperture.



8. What are the Guard Cells?
Ans. Guard cells are cells surrounding each stoma. They help to regulate the rate of transpiration by opening and closing the stomata.

9. **Explain the mechanism of opening and closing of stomata.**
There are different mechanisms which are responsible for the opening and closing of the stomata. The opening and closing depends upon the turgor pressure in the guard cells. The swelling of guard cells due to absorption of water causes opening of stomatal pores while shrinking of guard cells closes the pores. Opening and closing of stomata occurs due to turgor changes in guard cells. When guard cells are turgid, stomatal pore is open while in flaccid conditions, the stomatal aperture closes. There are other theories which explains the opening and the closing of the stomatal pore.



10. **How chlorophyll affects Photosynthesis?**
Ans. Chlorophyll is the green pigment that absorbs light energy. It is present in the chloroplasts which occur in green parts of plants, mainly the leaves. Hence Photosynthesis takes place only in green parts of the plants.

11. **How sunlight affects Photosynthesis?**
Ans. Sunlight is essential for photosynthesis, its duration, intensity and quality affects rate of photosynthesis.
Ex: Low light slows down the rate of photosynthesis, too much bright light destroys chlorophyll and hampers photosynthesis.

12. **How Temperature affects Photosynthesis?**
Ans. Optimum temperature of Photosynthesis is 20^0C – 30^0C. It is slow at low temperature and also slows down when temperature is 40^0C and above because get denatured at high temperature.

13. **How Carbon-Di-Oxide affects Photosynthesis?**
    Ans. Carbon-Di-Oxide in the air increase the rate of Photosynthesis. The rate of photosynthesis increases with an increase in CO_2 consumption up to 0.1%. Beyond this concentration, the rate of photosynthesis decreases.

14. **What are the significances of Photosynthesis?**
    Ans. Photosynthesis is a life supporting process. It provides:
    a. Oxygen for respiration to all living plants and animals.
    b. Food for all the form of Glucose.

15. **What is Translocation?**
    Ans. Glucose is soluble in water and is transported to different parts of the plants through phloem. This is called Translocation.

16. **What is Autotropic Nutrition?**
    Ans. Green plants make their food by photosynthesis. Therefore, planta are called Autotrophs, and the Nutation in plants are called Autotropic Nutrition.