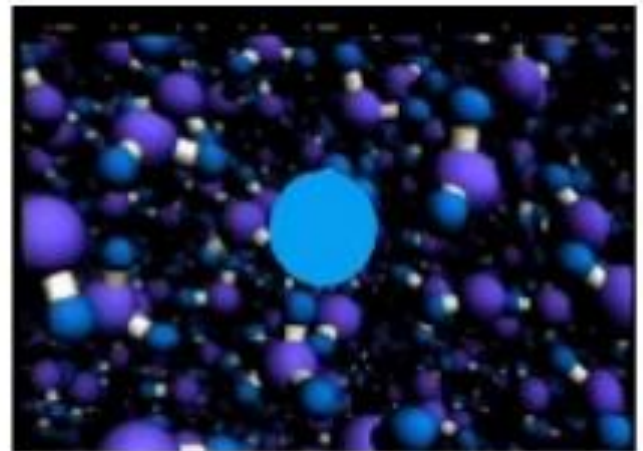
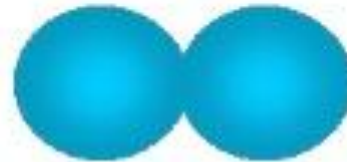
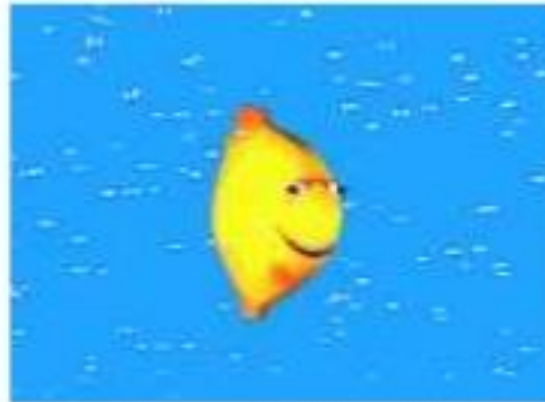


CHAPTER - 6

LIFE PROCESSES

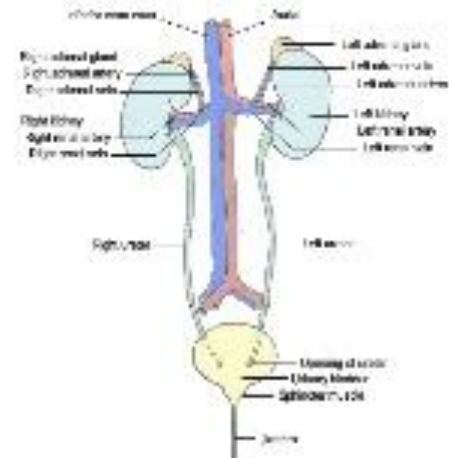
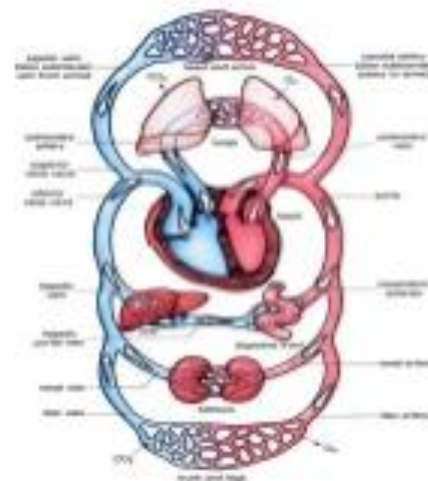
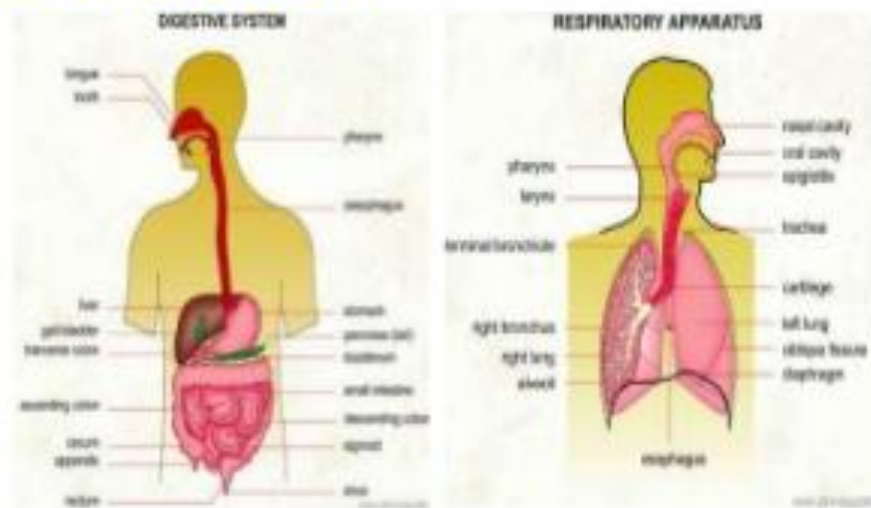
1) Criteria to decide whether something is alive :-

- The most important criteria to decide whether something is alive is movement. All living things move without the help of any external help. Some movements are easily visible like the movements of body parts. Some movements are not easily visible like molecular movements. The molecular movements in cells and tissues is necessary for all life processes.



2) Life processes :-

- Life processes are the basic processes in living organisms which are necessary for maintaining their life. The basic life processes are – nutrition, respiration, transportation, and excretion.
- **i) Nutrition** :- is the process of taking food by an organism and its utilization by the body for life processes.
- **ii) Respiration** :- is the process by which food is burnt in the cells of the body with the help of oxygen to release energy.
- **iii) Transportation** :- is the process by which food, oxygen, water, waste products are carried from one part of the body to the other,
- **iv) Excretion** :- is the process by which waste products are removed from the body.



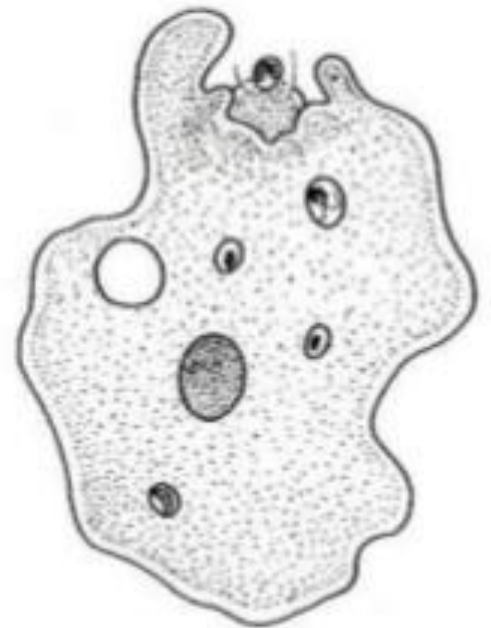
3) Nutrition :-

- **Nutrition** is the process of taking food by an organism and its utilisation by the body to build the body, for growth, to repair the damaged parts of the body and for energy.
- Life on earth depends on carbon based molecules and most of the food are also carbon based molecules. The outside raw materials used by living organisms are food, water and air.
- **a) Modes of nutrition :-** There are two main modes of nutrition. They are autotrophic nutrition and heterotrophic nutrition.
- **i) Autotrophic nutrition :-** is nutrition in which organisms prepare their own food from simple inorganic substances like carbon dioxide and water in the presence of sunlight and chlorophyll.
- **Eg :-** all green plants and some bacteria.
- **ii) Heterotrophic nutrition :-** is nutrition in which organisms get their food directly or indirectly from plants.
- **Eg :-** all animals fungi and some bacteria.
- **b) Types of heterotrophic nutrition :-** There are three main types of heterotrophic nutrition. They are saprophytic, parasitic and holozoic nutritions.

• **i) Saprophytic nutrition** :- is nutrition in which organisms get their food from dead and decaying organisms. They break down the food material outside their body and then absorb it. Eg :- mushroom, bread mould, yeast, some bacteria etc.

• **ii) Parasitic nutrition** :- is nutrition in which organisms get their food from living organisms (host) without killing them. Eg :- cuscuta, orchids, ticks, lice, leeches, round worm, tape worm, plasmodium etc.

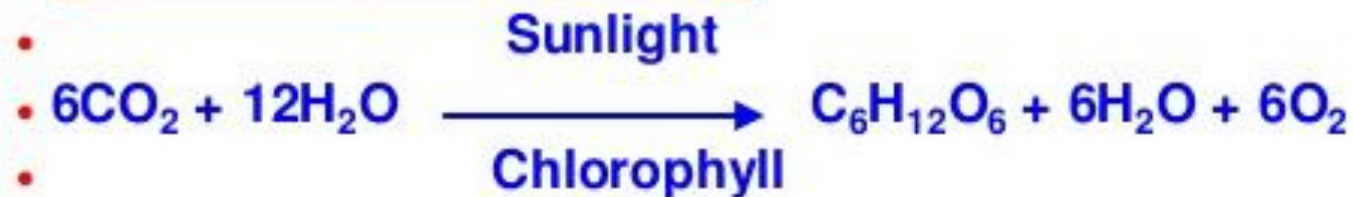
• **iii) Holozoic nutrition** :- is nutrition in which organisms take food directly and then digest and absorb it. Eg :- amoeba, paramaecium, birds, fishes, humans etc.



4) Nutrition in plants :-

- **Photosynthesis** :- is the process by which plants prepare food by using carbon dioxide and water in the presence of sunlight and chlorophyll. The food prepared is carbohydrate which is stored in the form of starch. Oxygen is released in this process.

- **Equation of photosynthesis** :-



- **Process of photosynthesis** :-

- Photosynthesis takes place in three main steps. They are :-

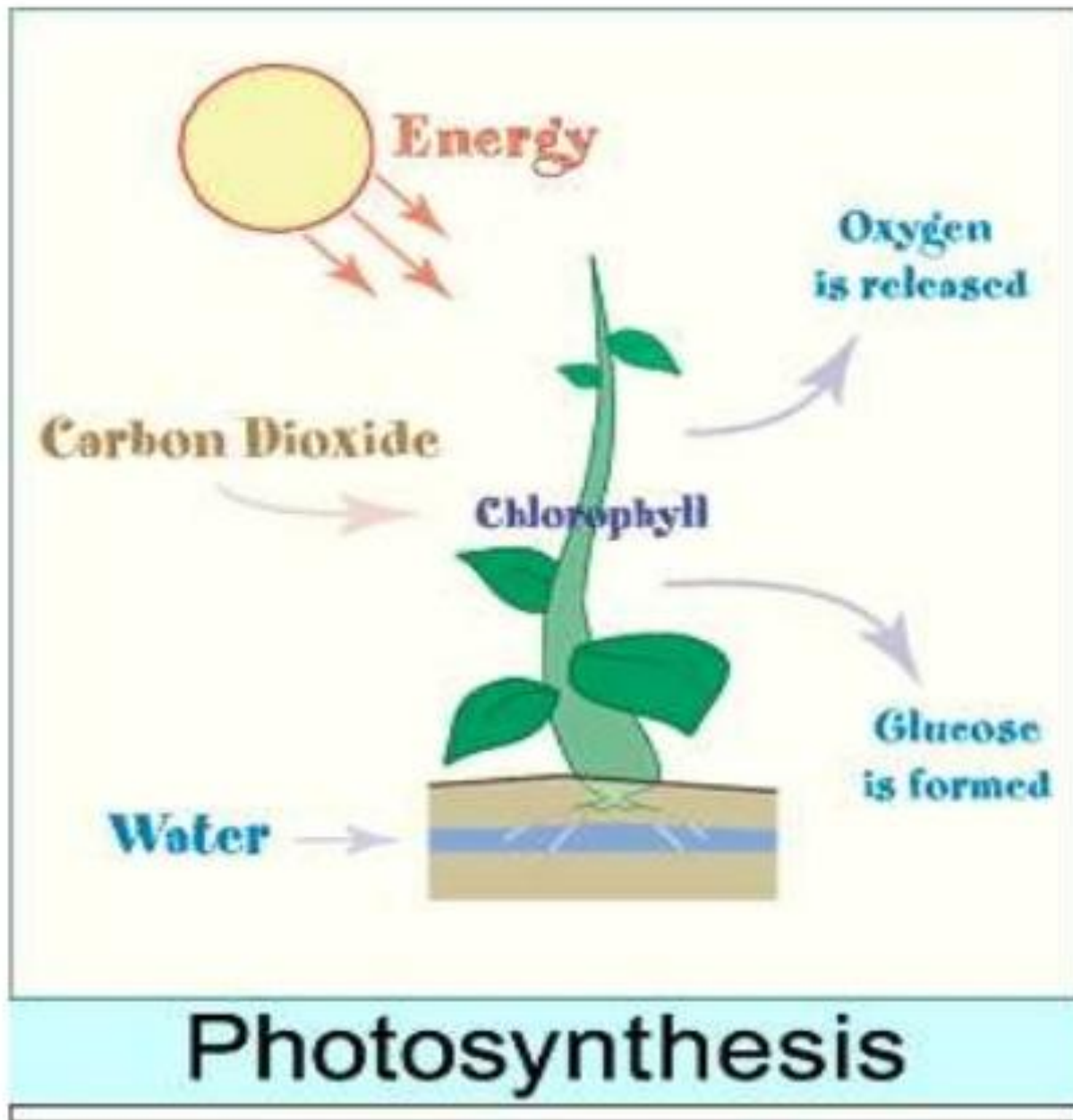
- i) Absorption of light energy by chlorophyll.

- ii) Conversion of light energy into chemical energy and splitting up of

- water molecules into hydrogen and oxygen.

- iii) Reduction of carbon dioxide by hydrogen to form carbohydrates.

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Chlorophyll :- are the green pigments present in the leaves. If we observe a cross section of a leaf under a microscope, we can see cells containing green dot like structures called chloroplasts which contain chlorophyll.

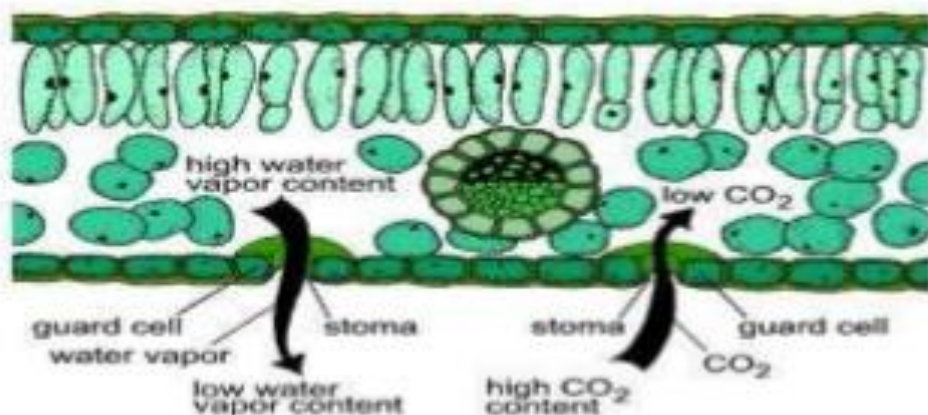
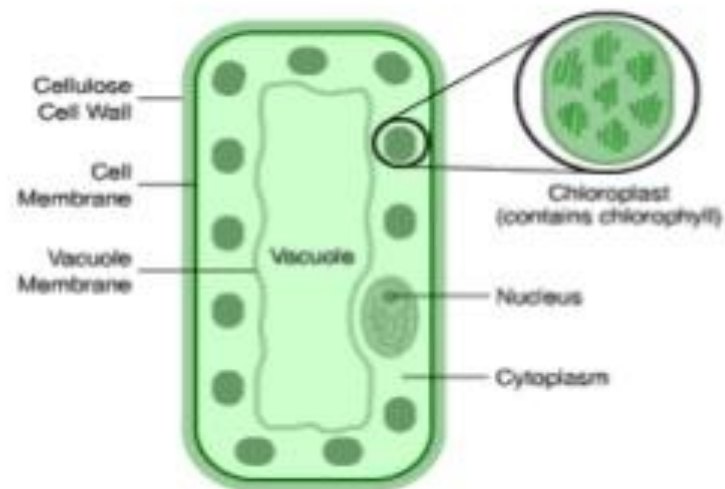
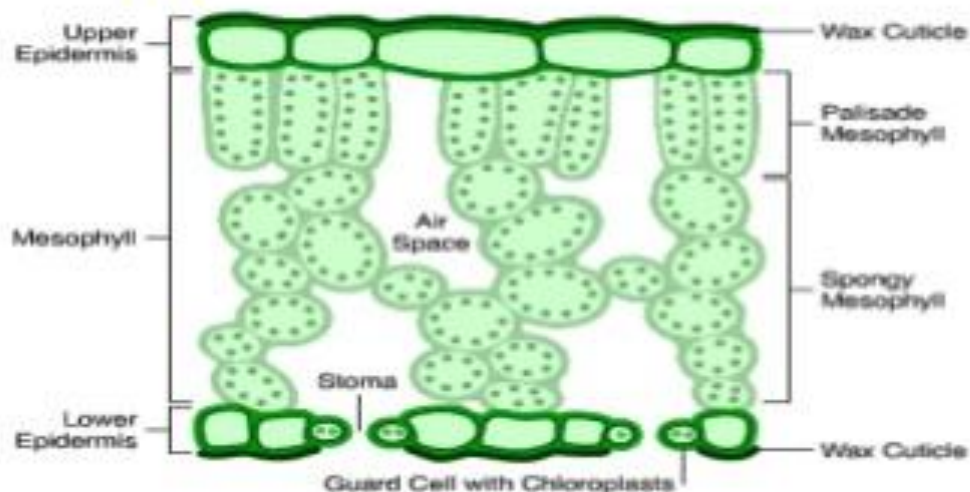
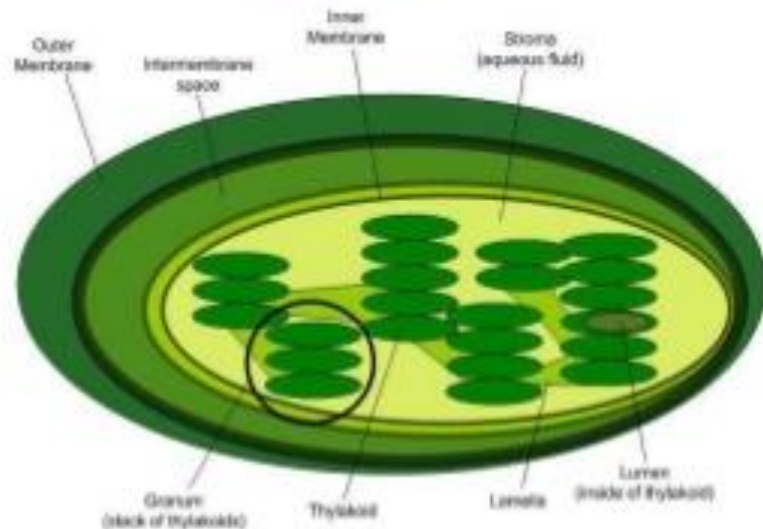
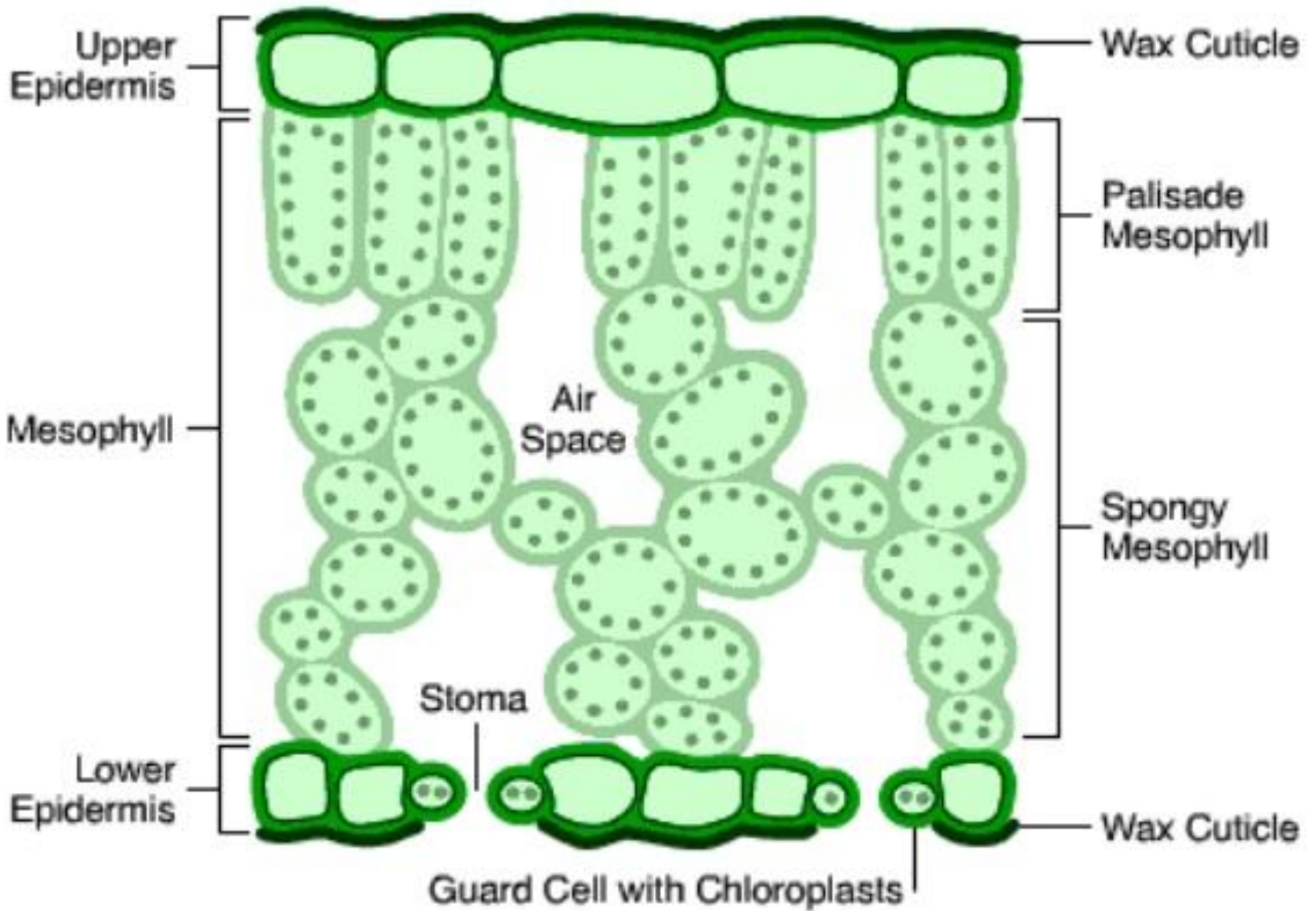
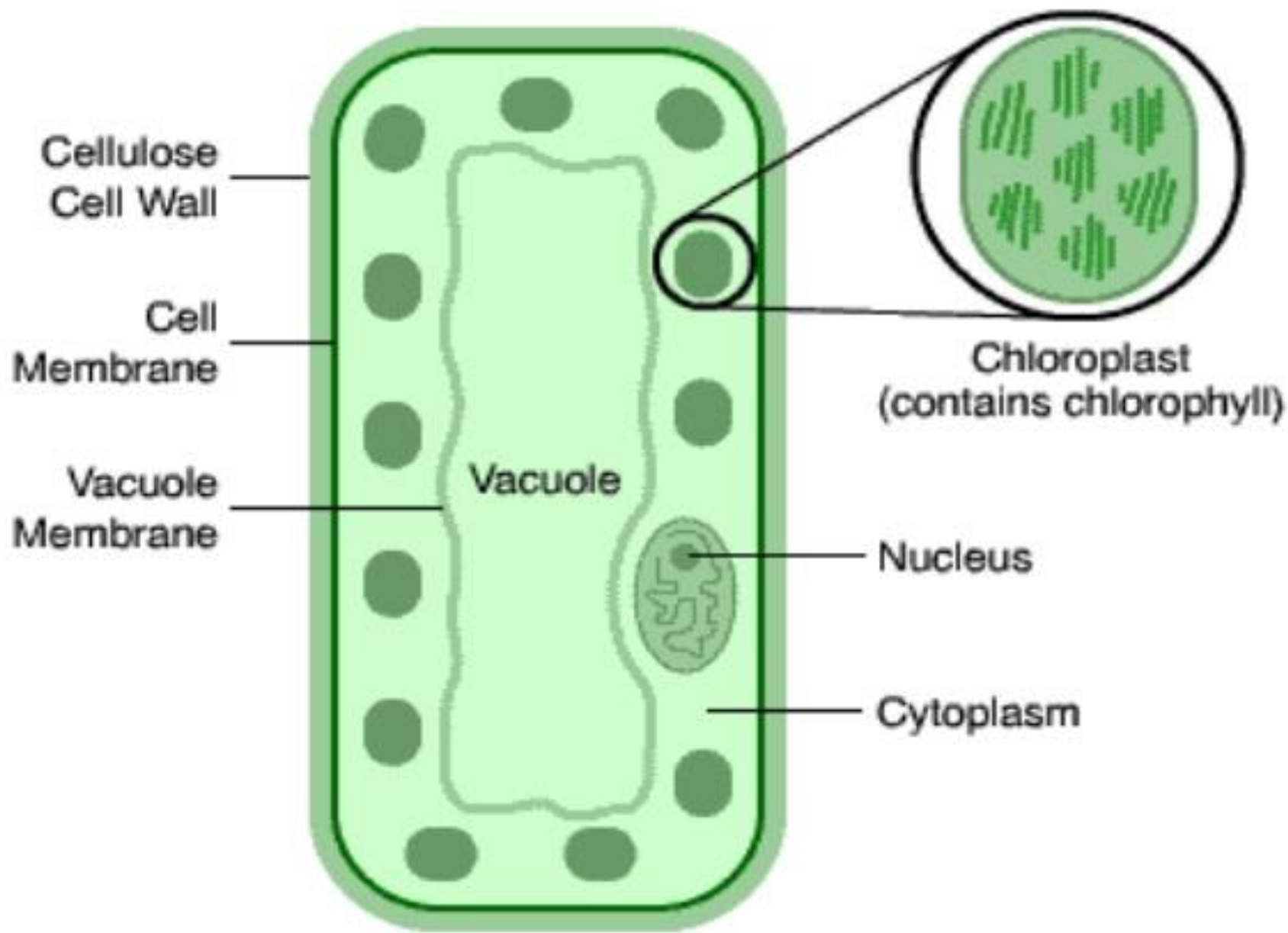
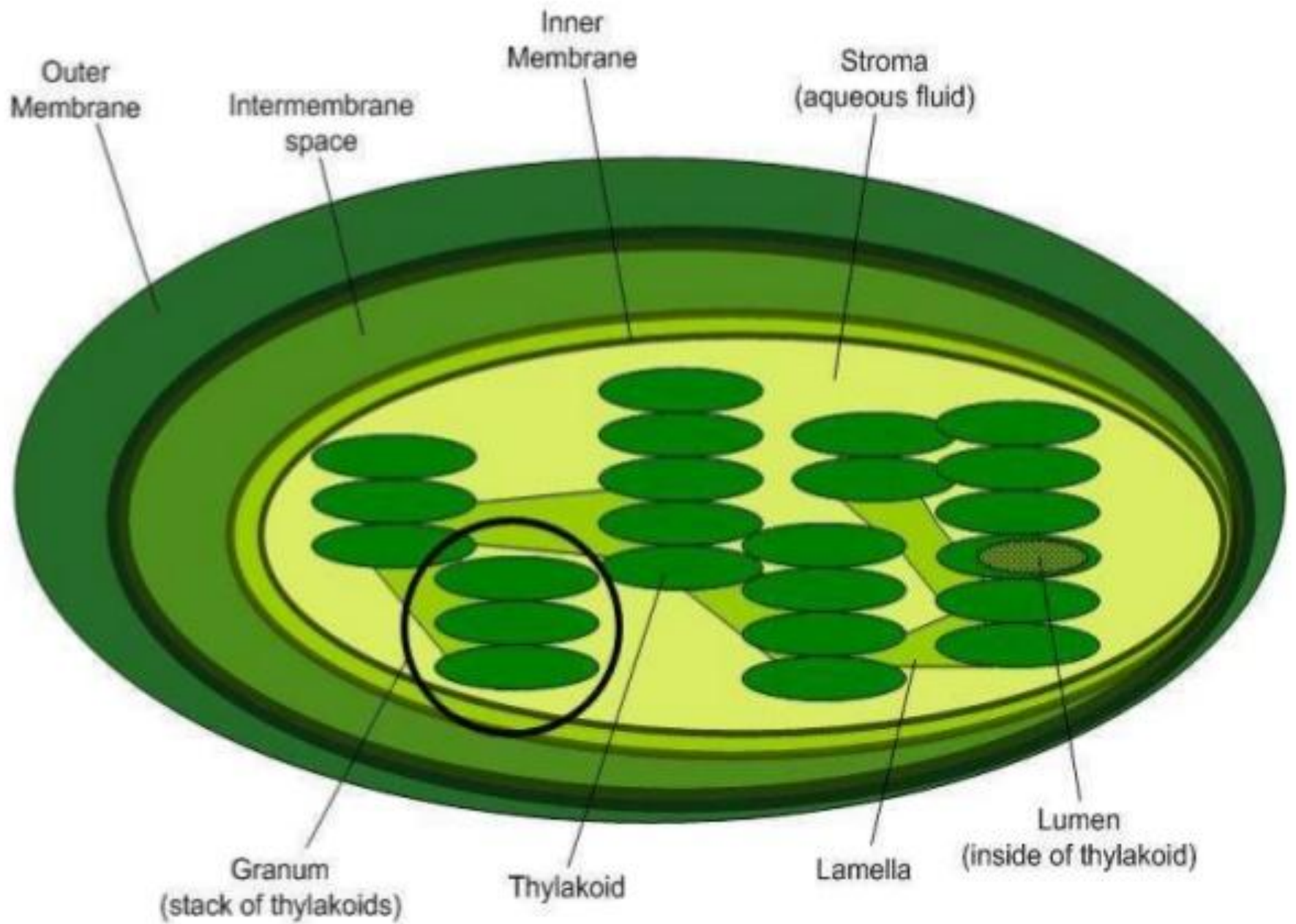


Figure 25. Stomata open to allow carbon dioxide (CO_2) to enter a leaf and water vapor to leave.









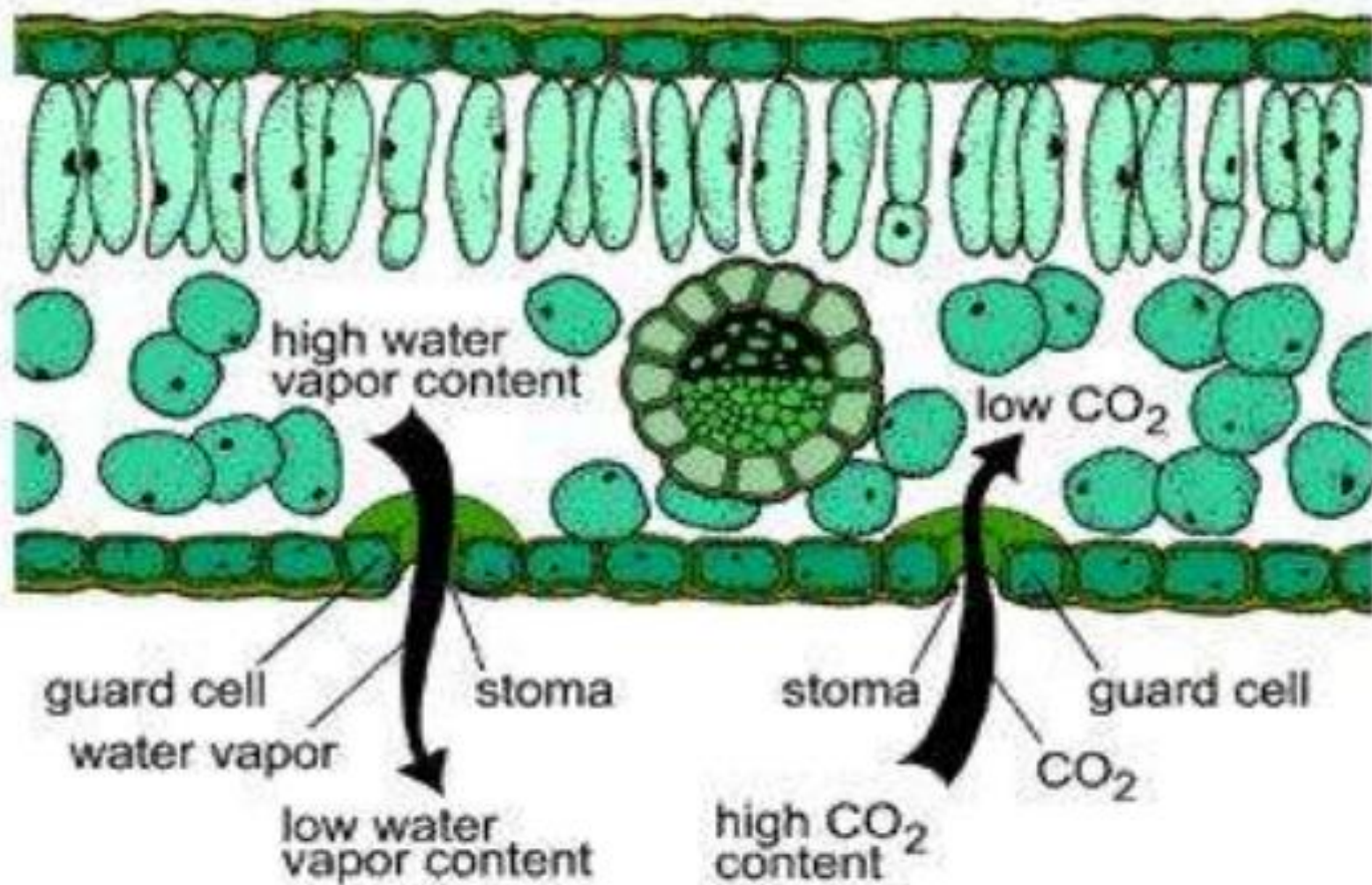
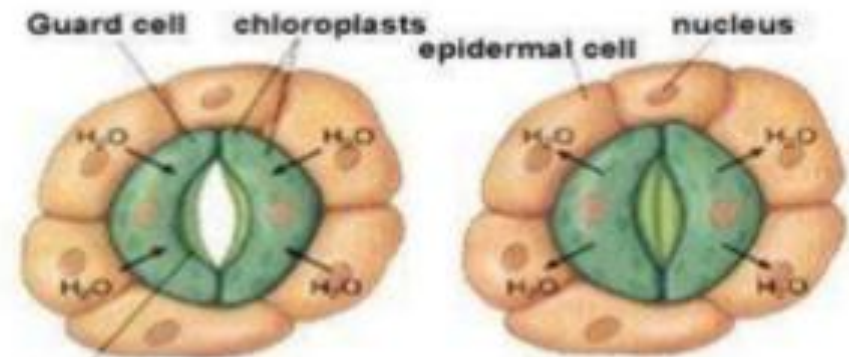
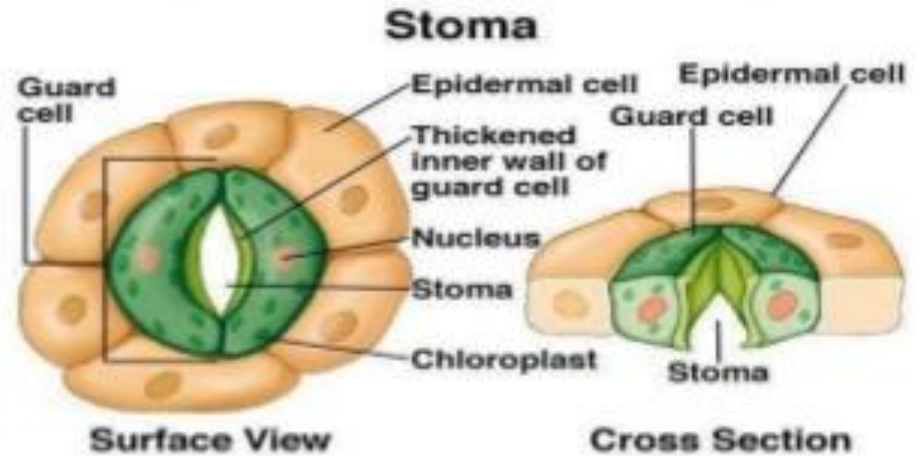


Figure 25. Stomata open to allow carbon dioxide (CO₂) to enter a leaf and water vapor to leave.

Stomata :- are tiny pores present in the leaves through which exchange of gases takes place. Each stoma has a pair of guard cells which controls the opening and closing of the stomatal pore. When water enters the guard cells, it swells and the pore opens and when the guard cells lose water, it shrinks and the pore closes.

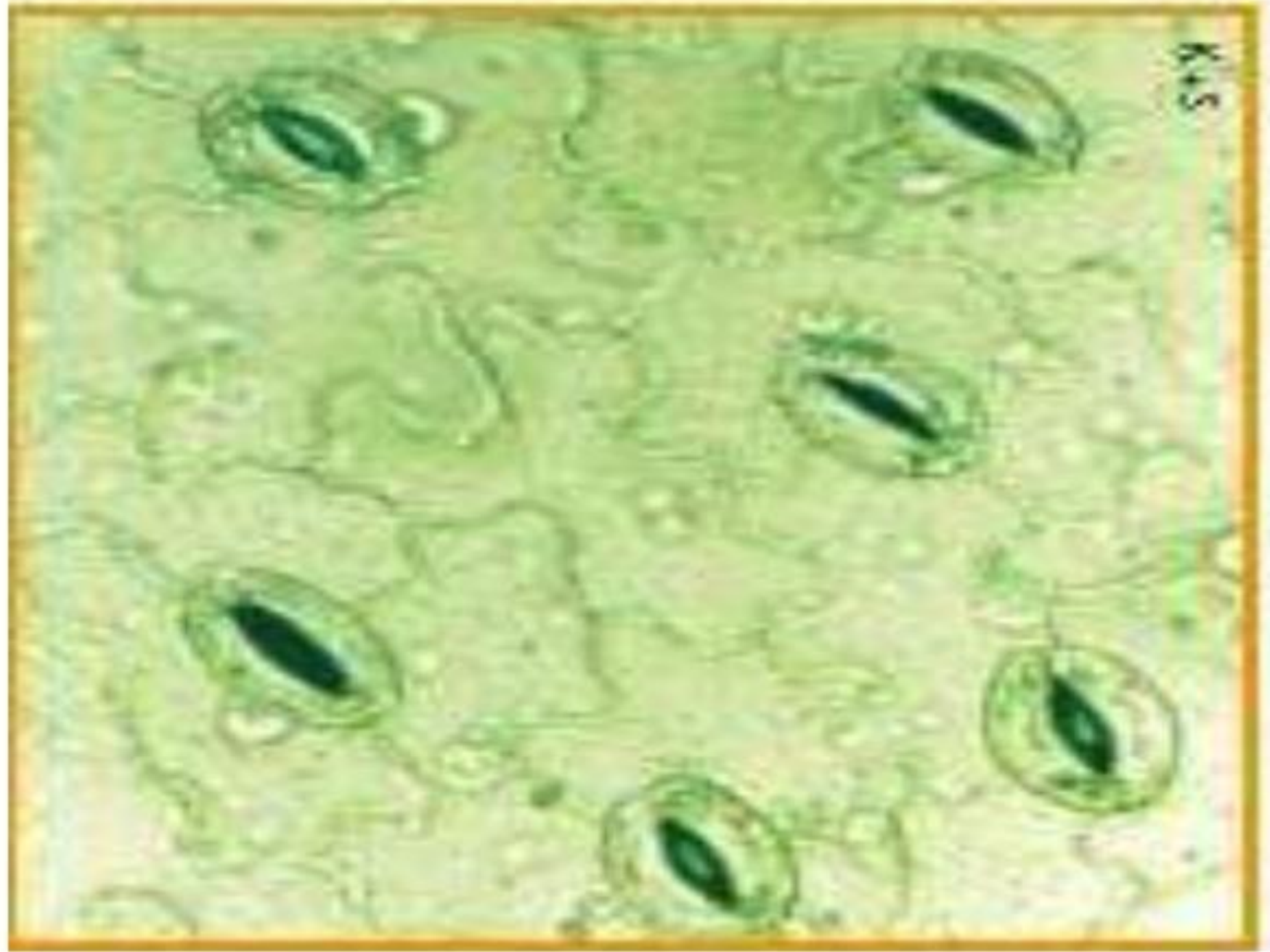
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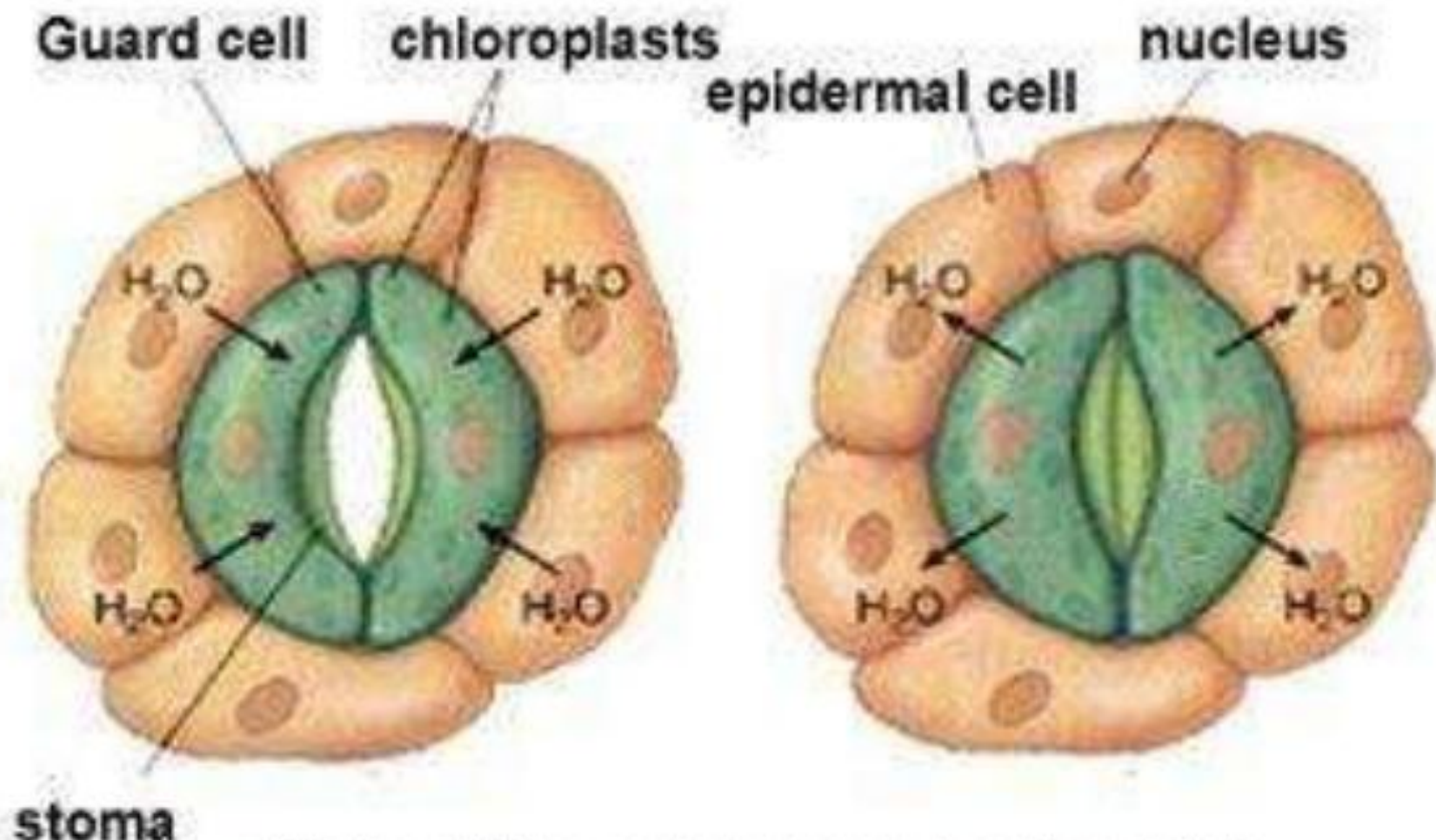


stoma

Water diffuses into guard cells which causes them to open. On hot/dry days, the guard cells have less water, they relax and the stoma close

K+S





Water diffuses into guard cells which causes them to open. On hot/dry days, the guard cells have less water, they relax and the stoma close

5a) Activity to show that chlorophyll is necessary for photosynthesis :-

- **Take a potted plant having variegated leaves (croton plant). Keep it in a dark room for three days so that all the starch is used up. Then keep it in sunlight for 6 hours. Then take a leaf from the plant and mark the green areas of the leaf on a sheet of paper. Then dip the leaf in boiling water to make it soft. Then dip the leaf in alcohol and heat it in a water bath to decolourise it and remove the chlorophyll. Then wash the leaf in water and dip it in dilute iodine solution. It will be seen that only the green parts of the leaf turns blue black. This shows that chlorophyll is necessary for photosynthesis.**

b) Activity to show that carbon dioxide is necessary for photosynthesis :-

- Take two potted plants of the same size and keep them in a dark room for three days so that all the starch is used up. Then keep the plants on separate glass plates. Keep a watch glass containing some potassium hydroxide near one plant to absorb carbon dioxide. Cover both the plants with bell jars and seal the bottom of the jars with vaseline to make it air tight. Keep the plants in sunlight for three hours. Then take a leaf from each plant and test for starch. The leaf of the plant kept in the jar containing potassium hydroxide does not show the presence of starch. This shows that carbon dioxide is necessary for photosynthesis.