**Chapter 4 Section 2 Notes - Overview of Photosynthesis**

- Plants are producers – they produce their own source of energy.
- **Photosynthesis –** the process by which light energy is converted to chemical energy; produces sugar and oxygen from carbon dioxide and water – takes place in chloroplasts
- **Chlorophyll** – molecule in chloroplasts that absorbs some of the energy in visible light (made of different wavelengths or colors of light)
- Plants use energy in visible light for photosynthesis

* 2 Main parts of chloroplasts are needed for photosynthesis:

1. grana (granum, singular) – stacks of compartments called **thylakoids** – shaped like coins, flat and circular and they are enclosed by membranes that contain chlorophyll
2. stroma – fluid that is all around the grana inside the chloroplast

- 2 stages of photosynthesis:

1. **Light-dependent reactions** – capture energy from sunlight

- takes place in the thylakoids and their membranes
  - chlorophyll absorbs energy from sunlight, energy moves along the thylakoid membrane and is transferred to molecules that carry energy, such as ATP
  - during this process $H_2O$ molecules are broken down and $O_2$ molecules are released

2. **Light-independent reactions** – use the energy from the light-dependent reactions to make sugars (Calvin Cycle)

- takes place in the stroma
  - $CO_2$ and energy from the light-dependent reactions are used to build sugars, usually glucose ($C_6H_{12}O_6$)

**$6CO_2$ + $6H_2O$ + light energy -----→ $C_6H_{12}O_6$ + $6O_2$**
**Carbon Dioxide + water + light energy ------→ a sugar + oxygen**

* Plants often use the simple sugars produced by photosynthesis to build starch and cellulose molecules.