Concept 8.1
Photosynthesis uses light to make food.

The Structure of Chloroplasts:

- Organelle where photosynthesis occurs.

- contain green pigment **chlorophyll**

- leaves contain most of the chloroplasts and are the major sites of photosynthesis

- Within the leaf the chloroplasts are concentrated in the cells of the **mesophyll**.

Like mitochondrion,a chloroplast has an inner and an outer membrane.

The inner membrane encloses a thick fluid called **stroma**.

In the stroma are many disk-shaped sacs called **thylakoids**, each having a membrane surrounding an interior space.

The thylakoids are arranged in stacks called **grana**.

Overview of Photosynthesis:

6 CO_2 + 6H_2O -- -- -- $C_6H_{12}O_6$ + 6O_2

Photosynthesis occurs in two stages, each with many step; the light reactions and the Calvin cycle.

The Light Reactions:

- convert energy in sunlight to chemical energy
- depend on molecules in the thylakoid membrane

Steps:

1. Chlorophyll captures light energy.
2. Uses energy to remove electrons from water.
3. O is released H are used to make NADPH
4. Also generate ATP

The overall result of the light reactions is the conversion of light energy to chemical energy stored in two compounds: NADPH and ATP

The Calvin Cycle:

- makes sugar from CO and H and high-energy electrons carried by NADPH
- enzymes used are dissolved in the stroma
- ATP made in the light reaction provides the energy to make sugar.

Sometimes referred to as the **light-independent reaction** because it does not directly require light to begin. Though it requires two inputs supplied by the light reactions, ATP and NADPH.