The Chloroplast

-A chloroplast contains saclike photosynthetic membranes called thylakoids. These are arranged in stacks known as grana (singular: granum).

Proteins in the thylakoid membrane organize chlorophyll and other pigments into clusters called photosystems. These are the light collecting units of the chloroplast.

There are two reactions that occur in the chloroplast:

1. **Light dependent reactions** – take place in the thylakoid membrane

   The light dependent reactions use:
   Water, ADP, NADP+ (an electron carrier), Sunlight

   They produce:
   Oxygen, Two high energy compounds – ATP and NADPH

   These compounds will be used to provide the energy to build the sugars produced in the next step.

2. **Light independent reactions** (or Calvin cycle) – take place in the stroma (the region outside the thylakoid membranes)

During the Calvin Cycle, plants use the energy from ATP and NADPH from the light dependent reactions to produce high energy sugars.

The Calvin Cycle uses 6 molecules of carbon dioxide, ATP, and NADPH to make a single 6 carbon sugar.