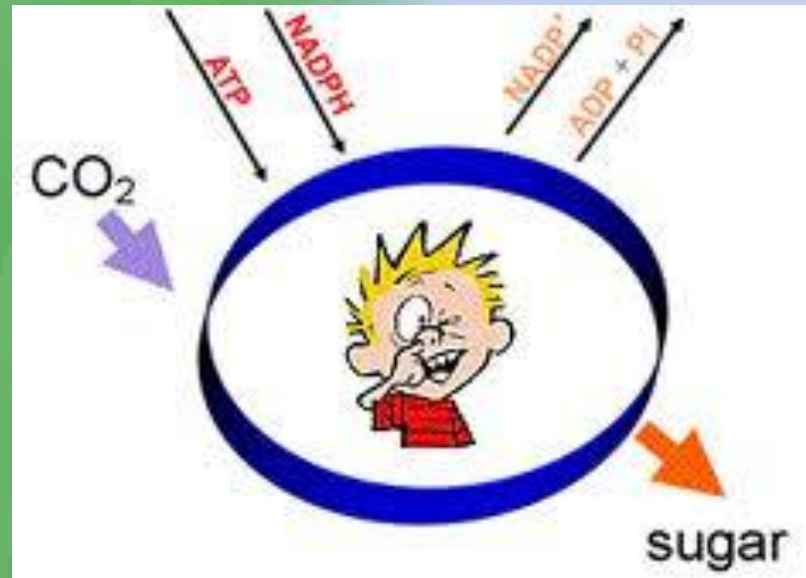


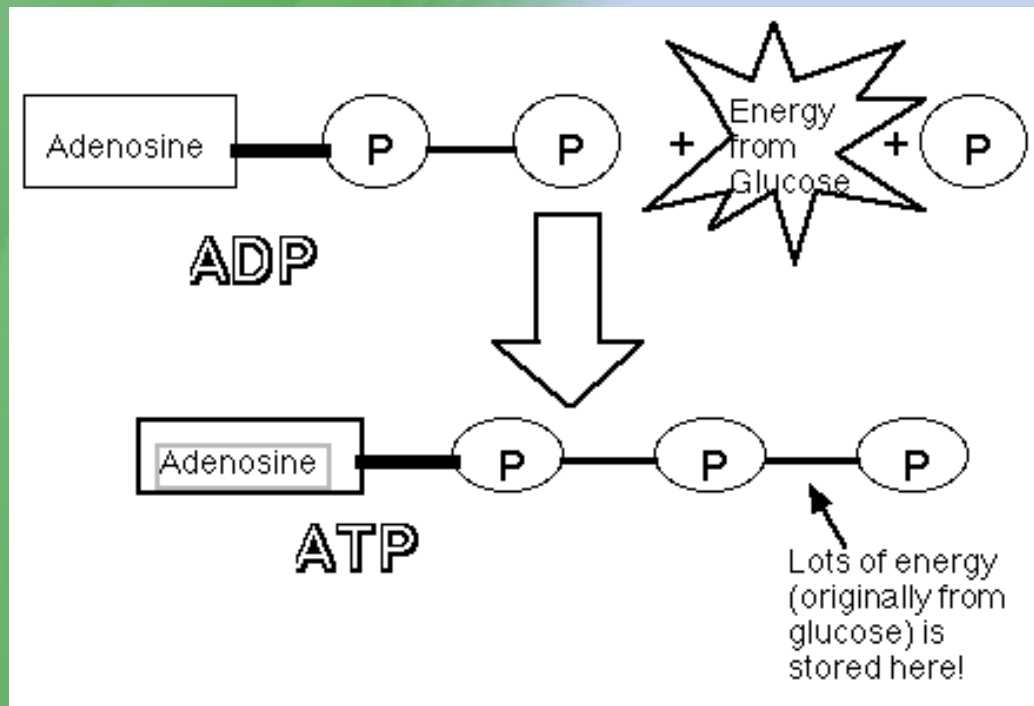
# Photosynthesis

## Chapter 4.2



# Review

- Carbon based (organic) molecules are needed to make ATP
- ATP provided energy for cells



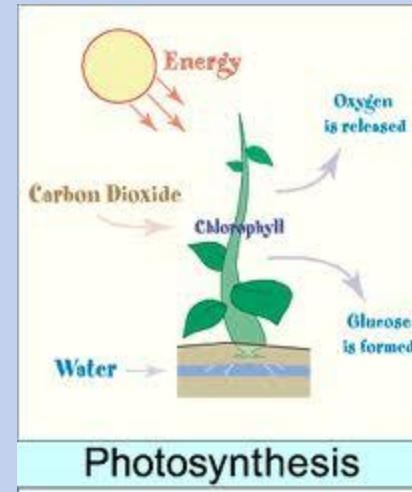
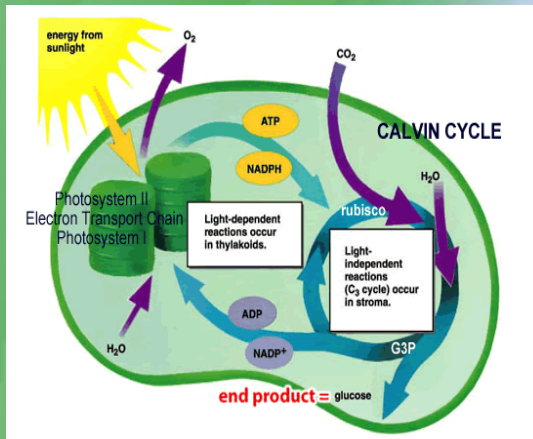
# Producers

- Organisms that convert energy into organic energy
- Plants, algae, some bacteria
- Photosynthesis - energy from sun
- Chemosynthesis - energy from inorganic chemicals



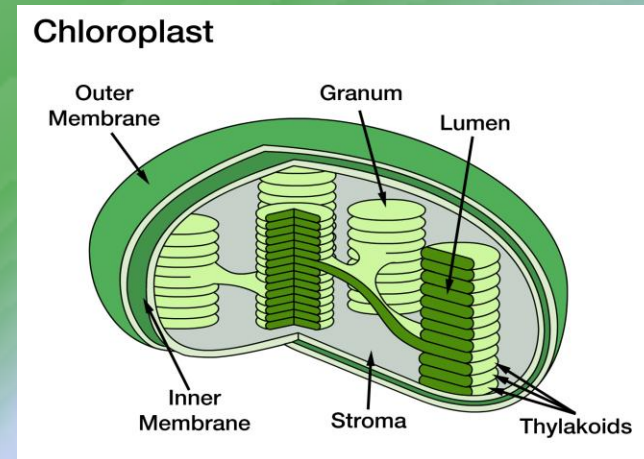
# Photosynthesis

- Plants absorb sun light
- Energy from sun used to make sugars
- $6\text{CO}_2 + 6\text{H}_2\text{O} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$



# Where does photosynthesis occur?

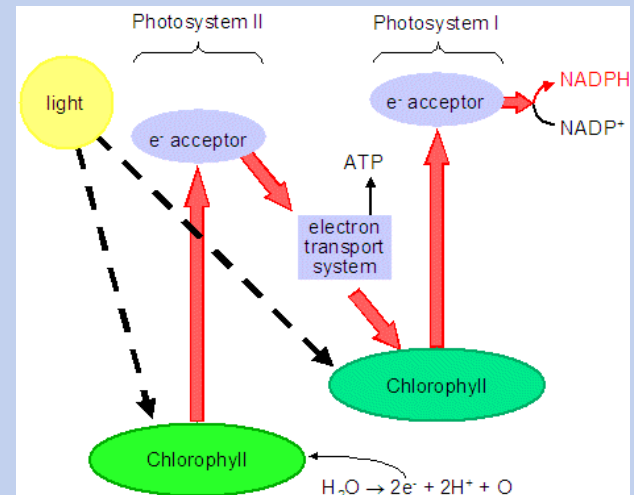
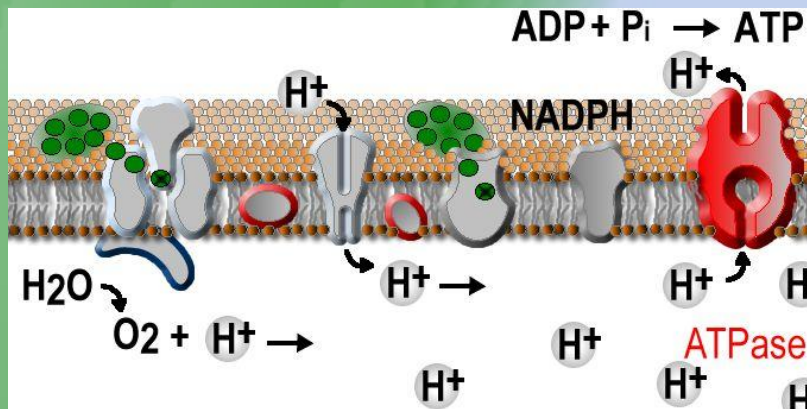
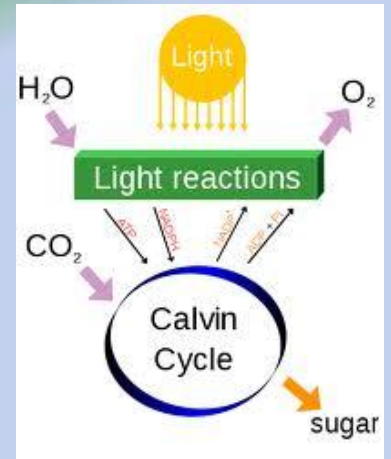
- CHLOROPLAST!
- Double membrane
- Inner and outer
- Contains chlorophyll pigment
- Grana = stacks of membranes called thylakoids
- Stroma = fluid inside chloroplast





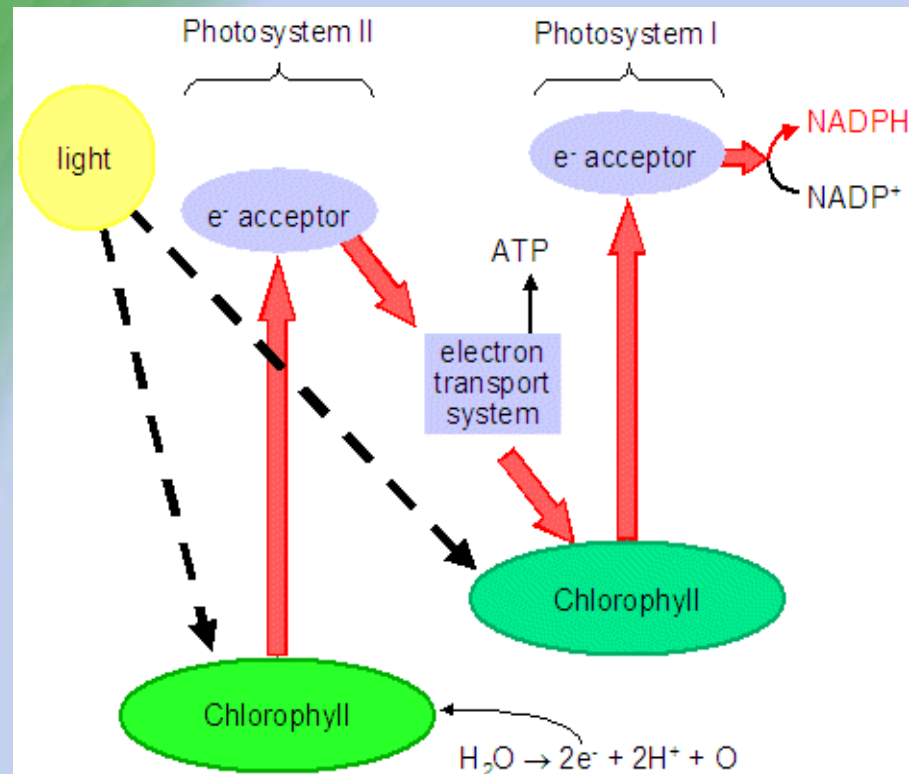
# Light dependent reactions

- Thylakoid membrane
- Photosystem II
  - Energy absorbed by chlorophyll
  - Water molecule is split
  - Hydrogen ions build up



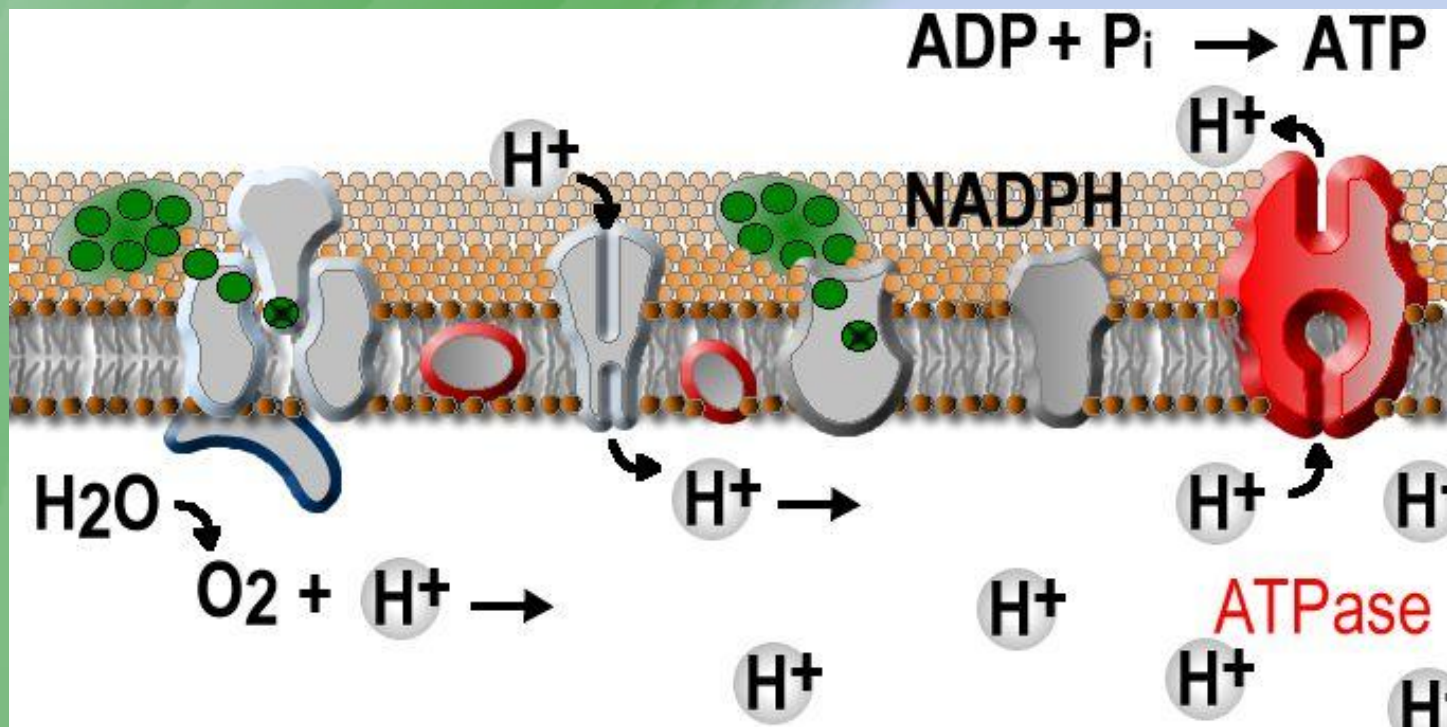
# Light dependent reactions

- Thylakoid membrane - Photosystem I
  - Energy absorbed by chlorophyll
  - Energy molecule made
    - NADPH



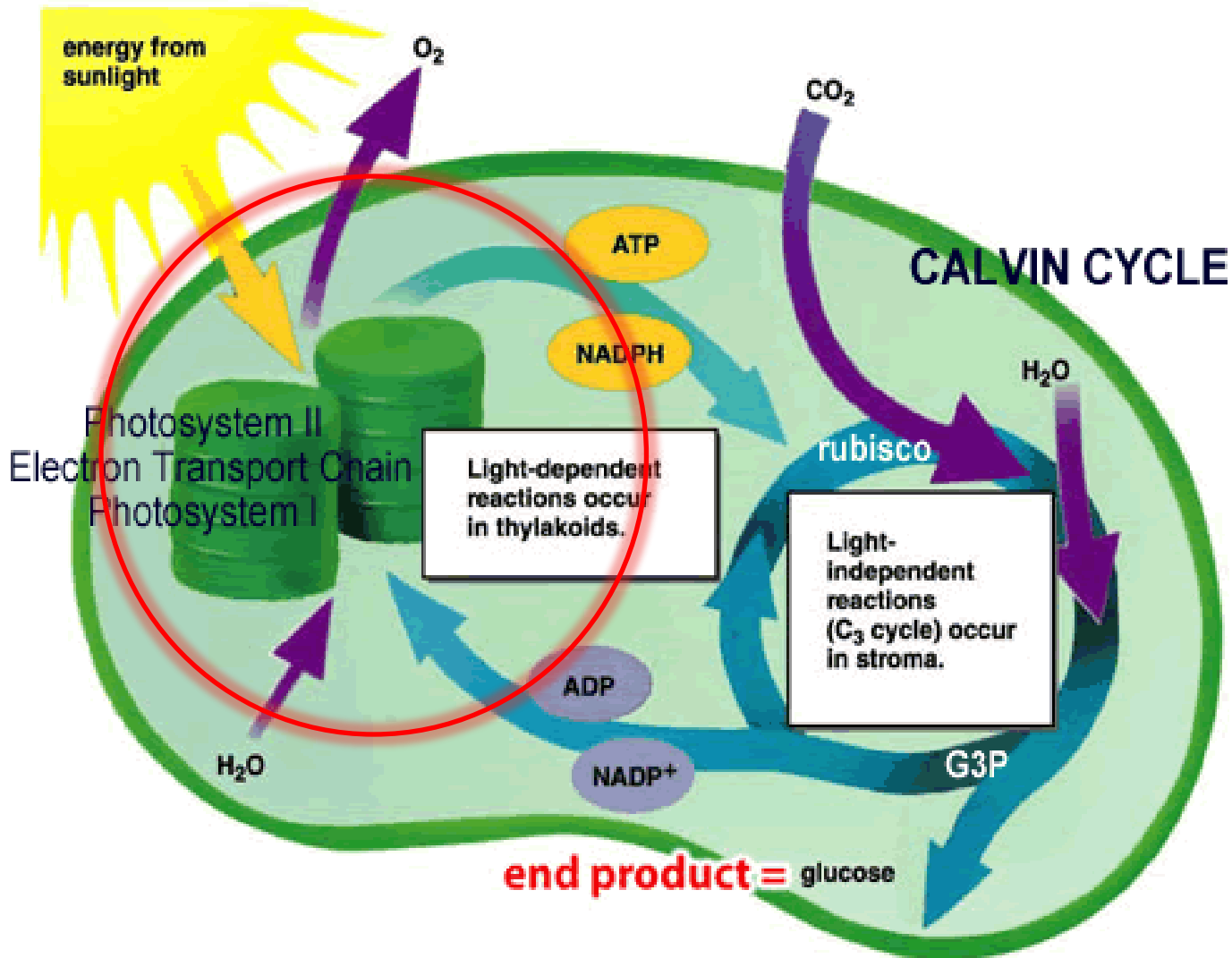
# Light dependent reactions

- Thylakoid membrane
  - ATP produced



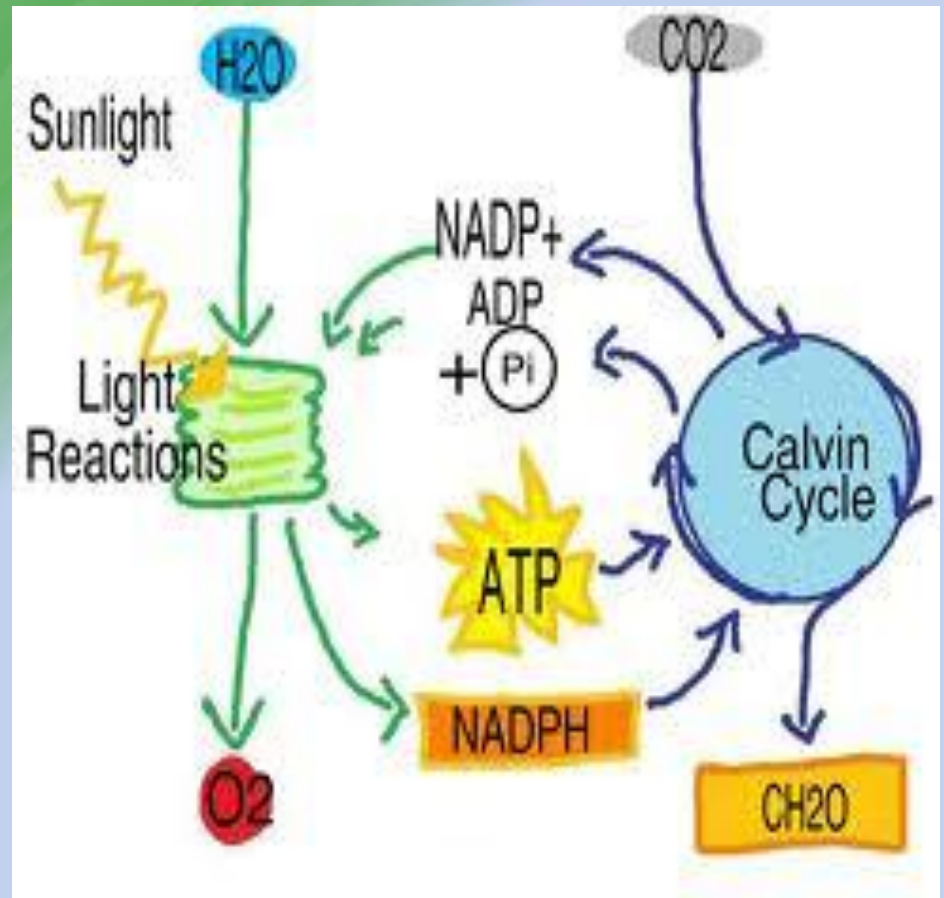


# Light dependent reactions



# Light independent reactions

- Calvin cycle
- NADPH and ATP from light dependent reactions used



# The Calvin Cycle

- Carbon dioxide enters cycle
- 3-carbon molecule formed and rearranged
- ATP and NADPH are used
- One 3 carbon molecule leaves
- After 2 rounds a complete glucose molecule is formed

