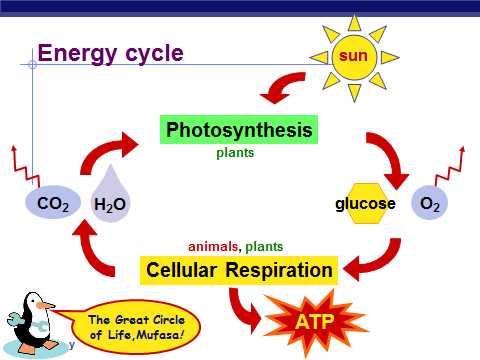
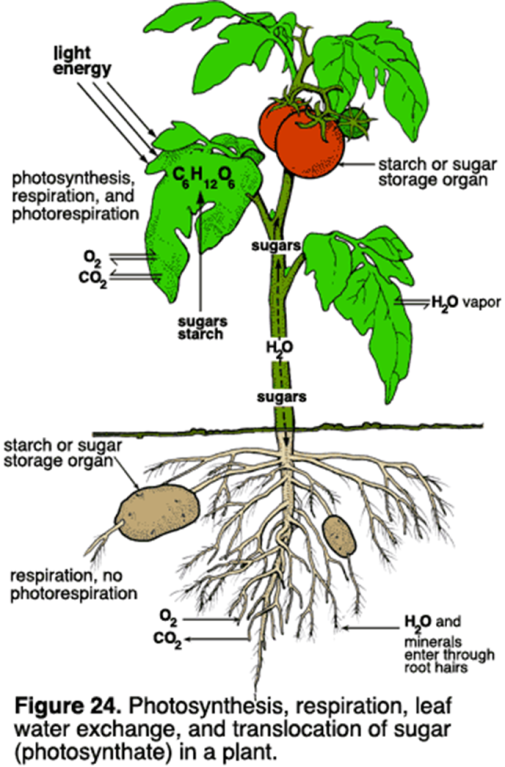
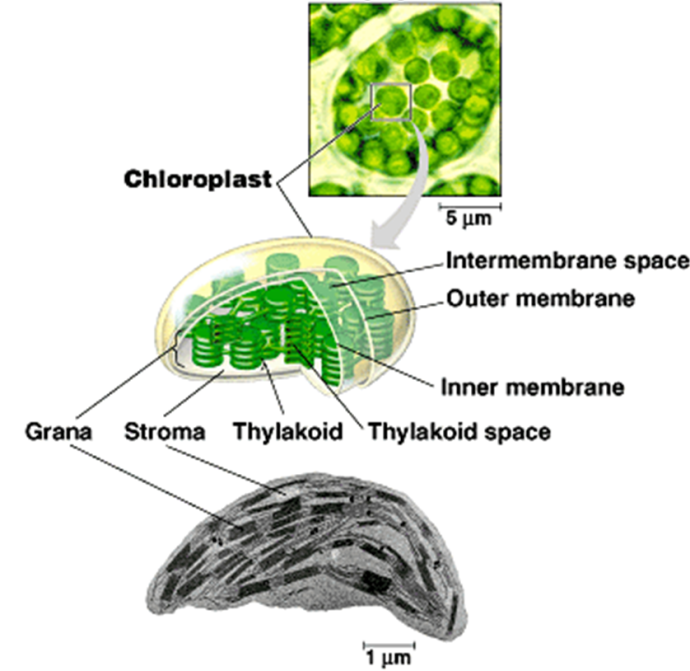
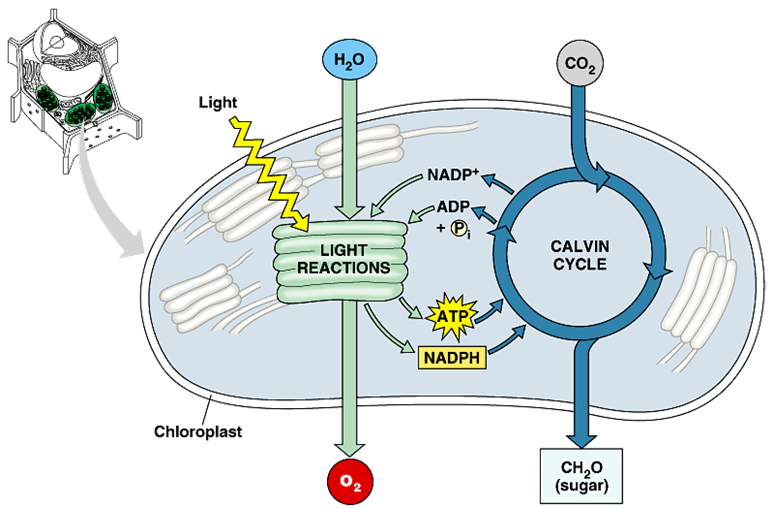
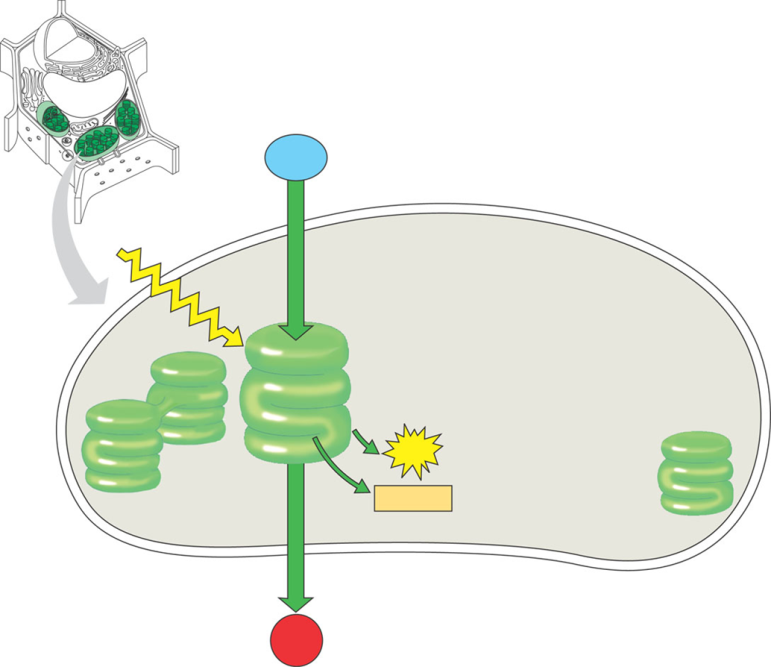
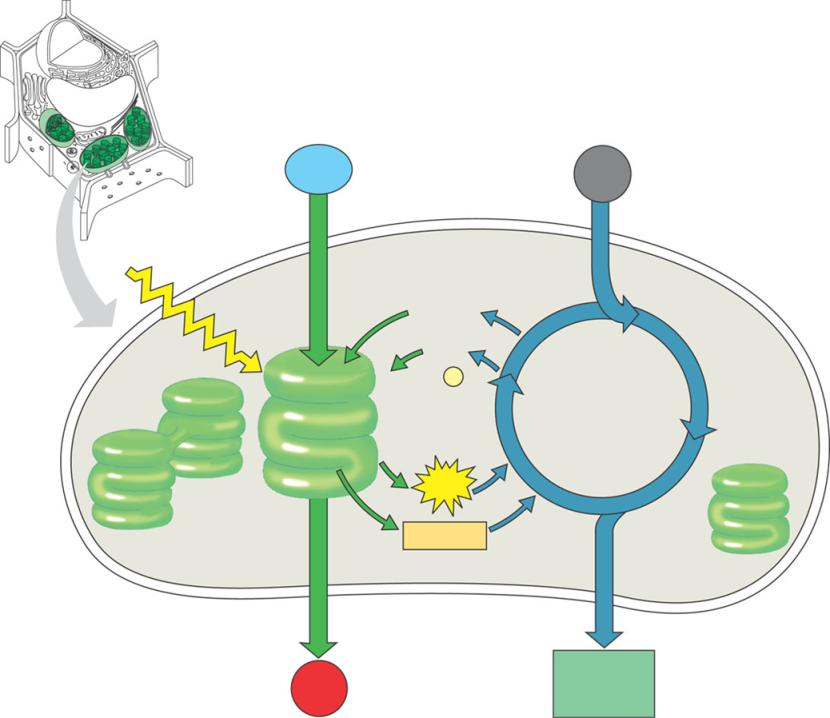
**Photosynthesis Notes**

1. **Energy needs of life**
   1. All life needs a constant input of energy
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Animals)
         1. get their energy from “eating others”
            1. eat food = other organisms = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         2. make energy through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Plants)
         1. get their energy from “self”
         2. get their energy from sunlight
         3. build \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (food) from CO2
         4. make energy & synthesize sugars through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Heterotrophs
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. animals
         2. fungi
         3. most bacteria
      2. Autotrophs
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         2. plants
         3. photosynthetic bacteria  
            (blue-green algae)
         4. chemosynthetic organisms
2. **How are they connected?**
   1. Heterotrophs
      1. glucose + oxygen → carbon dioxide + water + energy
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. Carbon dioxide and water yields glucose and oxygen
      4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **What does it mean to be a plant?**
   1. Need to…
      1. collect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy
         1. transform it into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy
      2. store light energy
         1. in a stable form to be moved around   
            the plant & also saved for a rainy day
      3. need to get \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
         from the environment
         1. C,H,O,N,P,K,S,Mg
   2. produce all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
      needed for growth
      1. carbohydrates, proteins, lipids, nucleic acids
4. **Plant structure** – Structure is related to function!!!!!!
   1. Obtaining raw materials
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = solar collectors
      2. \_\_\_\_\_\_\_\_\_
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas exchange
      3. \_\_\_\_\_\_\_\_
         1. uptake from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. N, P, K, S, Mg, Fe…
         2. uptake from roots
   2. **Chloroplasts**
      1. double membrane
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. fluid-filled interior
      3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. Thylakoid membrane contains
         1. chlorophyll molecules
         2. electron transport chain
         3. ATP synthase
            1. H+ gradient built up within thylakoid sac



1. **Photosynthesis**
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Light-dependent reactions
      2. energy production reactions
         1. convert solar energy to chemical energy
         2. ATP & NADPH
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. light-independent reactions
      2. sugar production reactions
         1. uses chemical energy (ATP & NADPH) to reduce CO2 & synthesize C6H12O6
2. **Light Reactions**
   1. produces ATP
   2. produces NADPH
   3. releases O2 as a waste product



1. **Calvin Cycle**
   1. builds sugars
   2. uses ATP & NADPH
   3. recycles ADP & NADP back to make more ATP & NADPH