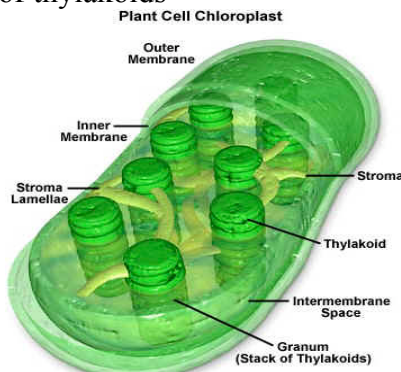


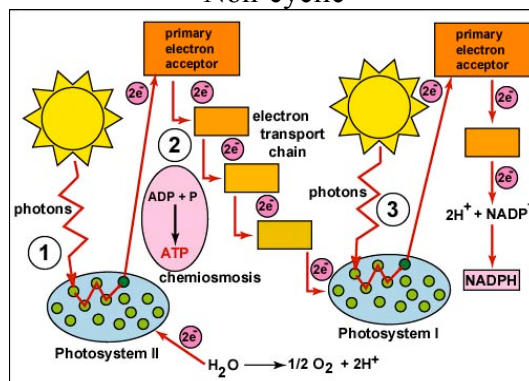
Photosynthesis Study Guide (Chapter 8)

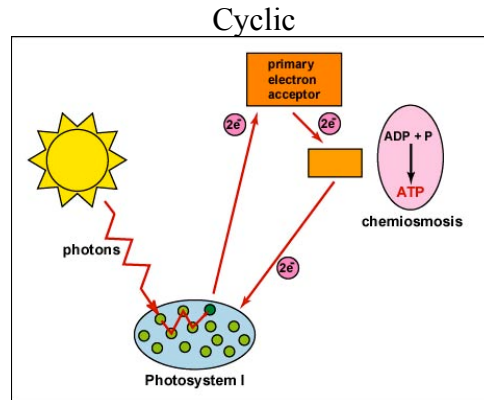
- Photosynthesis – an organism's ability to convert light energy into chemical energy
 - occurs within photoautotrophs (make own food with sunlight)
 - occurs in plant's chloroplasts
 - chlorophyll – green pigment required for photosynthesis
- Chloroplast – plant cell structure bounded by inner and outer membranes
 - stroma – fluid-filled region containing enzymes required to make carbohydrates
 - thylakoids – sacs where the chlorophyll is located
 - lumen – fluid-filled region that facilitates photosynthesis
 - granum – a stack of thylakoids



- Chlorophyll – pigment that has the ability to absorb many wavelengths of light
 - Chlorophyll A – most dominant, bright green, absorbs almost every wavelength
 - Chlorophyll B – yellowish-green, accessory
 - absorption spectrum – pigment's ability to absorb light
- Photosynthesis Equation:
 - $6\text{CO}_2 + 12\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$
- Photosynthesis Phases:
 - Light-dependent – light is captured by chlorophyll, water molecules split creating high-energy molecules ATP and NADPH^+ (use energy for next phase)
 - Photo system – unit of proteins, chlorophyll that has the ability to capture light energy and transfer electrons inside thylakoids
 - Electron transport chain – movement of electrons from one membrane potential to the next, causes photolysis
 - Photolysis – use of light to split water molecule
 - (Photo)phosphorylation – addition of phosphate group to a molecule

Non-cyclic





- Chemiosmosis – mechanism by which the phosphorylation of ADP is coupled to diffusion down a proton gradient
 - Light-independent/Carbon Fixation – high-energy molecules ATP and NADPH^+ help to fix carbon from CO_2 to produce glucose, takes place in stroma with aid of enzymes to finalize photosynthesis
 - Calvin Cycle:
 1. CO_2 uptake phase – CO_2 captured by ribulose biphosphate (RuBP) to be brought into plant, producing PGA
 2. Carbon reduction phase – PGA rearranged by ATP and NADPH^+ to form G3P molecule, G3Ps rearranged to form glucose molecule
 3. RuBP regeneration phase – ATP takes leftover G3Ps and converts them into RuBP
- Factors affecting photosynthesis:
 - Amount of sunlight available
 - Surface area of given plant
 - CO_2 concentration in air
 - Soil content and pH
 - Temperature