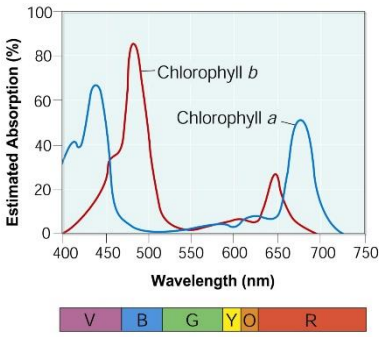
Name_____Date_____Per_____

CHAP 9.2 – PHOTOSYNTHESIS: AN OVERVIEW

Essential Question(s):

Questions:



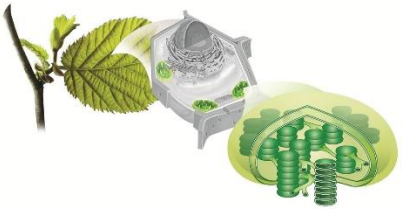
- The key cellular process identified with _____ production is **photosynthesis**.

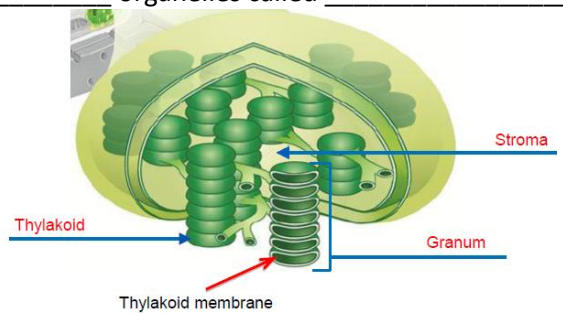
- Photosynthesis is the process in which _____ plants use the energy of _____ to convert water and carbon dioxide into high-_____ carbohydrates and oxygen.

Chlorophyll and Chloroplasts

- Light energy from the sun must be _____ for photosynthesis to occur.
- Sunlight is "_____" light—actually a _____ of different wavelengths.
- Photosynthetic organisms capture energy from sunlight with with light-absorbing molecules called _____.
  - The _____ pigment in plants is **chlorophyll.**
  - There are ___ main types of chlorophyll: chlorophyll *a* and chlorophyll *b*
- Chlorophyll _____ light well in the blue-violet and red regions of the visible _____ spectrum.
- Chlorophyll does _____ absorb light within the _____ region of the spectrum. Green light is _____ by leaves, which is why plants look green.
- Light is a form of energy, so any compound that _____ light also absorbs energy from that light.
- When chlorophyll absorbs light, much of the _____ is transferred directly to _____ in the chlorophyll molecule, raising the energy levels of these electrons.
- These high-energy electrons are what make _____ work.

Photosynthesis takes place _____ organelles called _____.





Electron Carriers

- The _____-energy electrons produced by chlorophyll are highly _____ and _____ a special "carrier."
- An electron carrier is a _____ that can accept a pair of high-energy electrons and _____ them, along with most of their energy, to another _____.
- NADPH can _____ the high-energy electrons that were _____ by light absorption in chlorophyll to _____ reactions elsewhere in the cell.

Questions:

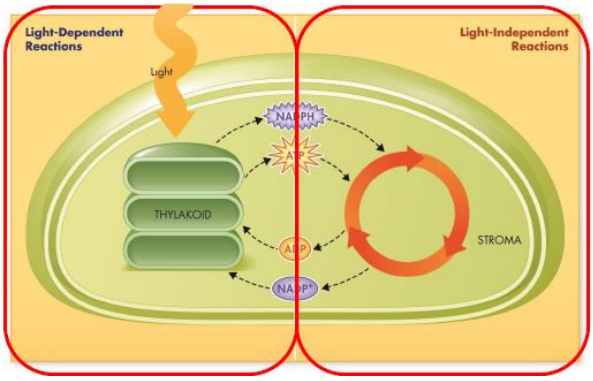
An Overview of Photosynthesis

- Photosynthesis uses the energy of sunlight to _____ water and carbon dioxide (_____-energy reactants) into_____-energy sugars and oxygen (products).

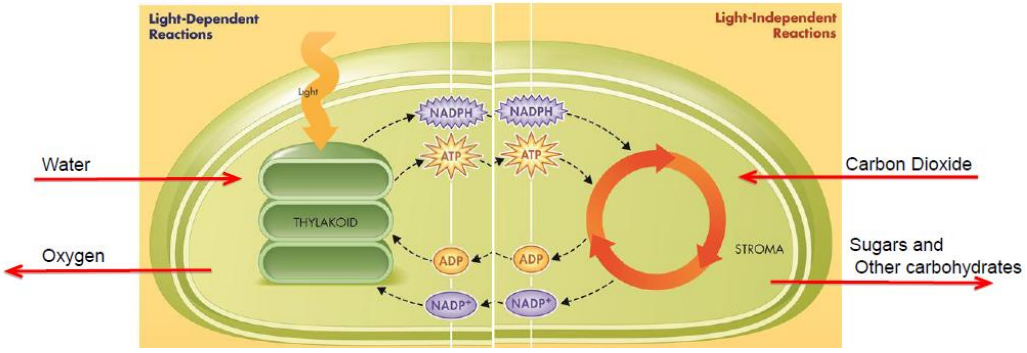
$$\text{Carbon dioxide} + \text{Water} \xrightarrow{\text{light}} \text{Sugars} + \text{Oxygen}$$

$$\underline{\quad 6CO_2 \quad} + \underline{\quad 6H_2O \quad} \xrightarrow{\text{light}} \underline{\quad C_6H_{12}O_6 \quad} + \underline{\quad 6O_2 \quad}$$

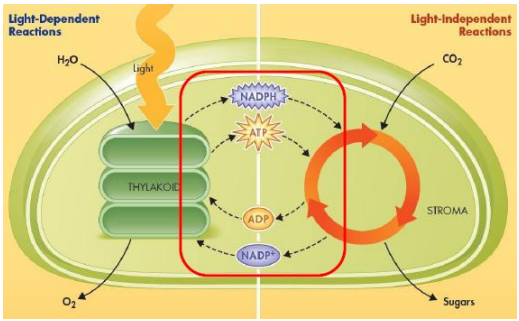
Photosynthesis involves _____ sets of reactions:



1. Light-_____ reactions
   - Light-dependent reactions _____ the _____ involvement of light and light-absorbing _____.
2. Light-_____ reactions
   - Light-independent reactions use _____ and _____ molecules produced in the light-dependent reactions to _____ high-energy sugars from carbon dioxide



Light-dependent and light-independent reactions have an _____ relationship.



Summary: