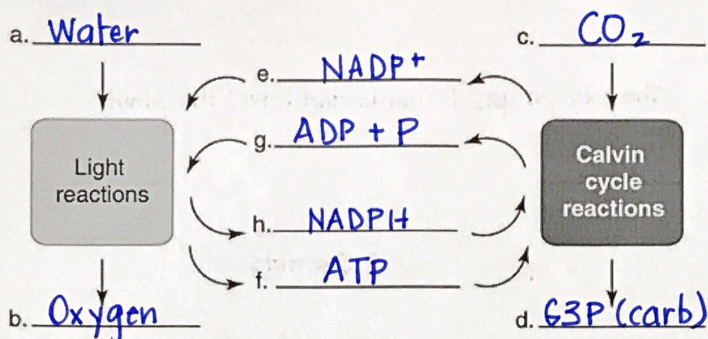


# PHOTOSYNTHETIC WORKSHEET



Label the diagram using the word bank:  
 NADPH  
 NADP  
 ATP  
 ADP + P  
 carbon dioxide  
 oxygen  
 carbohydrate  
 water.

Explain the significance of each item.

- The main photosynthetic pigments in plants are \_\_\_\_\_ and \_\_\_\_\_.  
 a. chlorophyll s; chlorophyll a  
 b. chlorophyll x; chlorophyll y  
 c. retinal pigment; accessory pigment  
 d. chlorophyll a; chlorophyll b  
**D**
- When a photon is absorbed by a molecule, the photon  
 a. loses its ability to generate any energy.  
 b. raises the molecule from a ground state of low energy to an excited state.  
 c. affects the molecule in ways that are not clearly understood.  
 d. causes a change in the velocity of the wavelengths.  
**B**
- Plants are green because  
 a. chlorophylls absorb blue and orange-red wavelengths of light and reflect green light.  
 b. chloroplasts transmit green light.  
 c. energized chlorophyll a emits green light.  
 d. plants do not possess green pigment.  
**A**
- When a photon is absorbed by chlorophyll,  
 a. the chlorophyll becomes "excited," or energized.  
 b. a greater number of light wavelengths can be absorbed.  
 c. ATP is split into ADP, phosphate, and energy.  
 d. hydrogen ions are released.  
**A**
- The O<sub>2</sub> gas produced during photosynthesis is derived from  
 a. CO<sub>2</sub>.  
 b. glucose.  
 c. water.  
 d. CO.  
**C**
- Which of the following does not happen in noncyclic electron transport?  
 a. Oxygen gas is released.  
 b. CO<sub>2</sub> reacts with RuBP.  
 c. Water donates electrons and protons.  
 d. NADPH forms.  
**B**
- Photosynthesis is the process that uses light energy to extract hydrogen atoms from  
 a. glucose.  
 b. chlorophyll.  
 c. water.  
 d. CO<sub>2</sub>.  
**C**
- In both photosynthesis and cellular respiration, protons are pumped across a membrane during  
 a. electron transport.  
 b. photolysis.  
 c. CO<sub>2</sub> fixation.  
 d. reduction of O<sub>2</sub>.  
**A**
- A suspension of algae is incubated in a flask in the presence of both light and CO<sub>2</sub>. When it is transferred to the dark, the reduction of 3-phosphoglycerate (3PG) to glyceraldehyde 3-phosphate (G3P) is blocked, and the concentration of ribulose 1,5- biphosphate (RuBP) declines. Why does the RuBP concentration decline?  
 a. RuBP needs to be regenerated from G3P.  
 b. Sugar is no longer generated from G3P.  
 c. There is a corresponding increase in RuMP.  
 d. Both a and b  
**A**
- Which of the following does photosynthesis and respiration have in common?  
 a. In eukaryotes, both processes occur in the mitochondrion.  
 b. ATP synthesis in both processes relies on the chemiosmotic mechanism.  
 c. Both require cyclic electron transport.  
 d. Both require light.  
**B**



11. Circle the letter of each sentence that is true about the light-dependent reactions. Correct the false statements.

- a. They convert ADP into ATP.
- b. They produce oxygen gas.
- c. They convert oxygen into carbon dioxide. *The oxygen gas is made and leaves the plant*
- d. They convert  $\text{NADP}^+$  into NADPH.

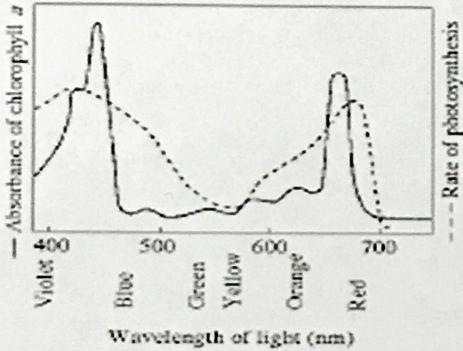
12. Circle the letter of each sentence that is true about the light-dependent reactions. Correct the false statements.

- a. High-energy electrons move through the electron transport chain from photosystem II to photosystem I.
- b. Photosynthesis begins when pigments in photosystem I absorb light. *P II starts*
- c. The difference in charges across the thylakoid membrane provides the energy to make ATP.

13. Circle the letter of each statement that is true about the Calvin cycle. Correct the false statements.

- a. The main products of the Calvin cycle are six carbon dioxide molecules. *is G3P, make half a glucose*
- b. Carbon dioxide molecules enter the Calvin cycle from the atmosphere.
- c. Energy from ATP and high-energy electrons from NADPH are used to convert 3-carbon molecules into similar 3-carbon molecules. *into 3 carbon sugar*
- d. The Calvin cycle uses six molecules of carbon dioxide to produce a single 6-carbon sugar molecule. *make 3 carbon, 2 turns needs to happen to make 6 carbon carbohydrate*

14. The graph shows the absorption spectrum for chlorophyll *a* and the action spectrum for photosynthesis. Why are they different? You need to have about 3 sentences about this. NEED DETAIL.



chlorophyll *a* has high absorption from 380 - 450 ish then 650 - 690 ish where high absorption the rate of photo synthesis goes up