**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Photosynthesis Packet**

**Light-Dependent Reactions**

**Overview:**



**1.** What occurs in the process of photosynthesis? Solar energy from the sun is converted into chemical energy in the form of glucose.

1. Write the overall equation for photosynthesis using words. Carbon Dioxide and Water in the presence of sunlight is converted into Glucose and Oxygen.

**3.** Write the overall equation for photosynthesis using chemical formulas. 6 CO2 + 6 H20 🡪 C6H1206 + 6 O2

**4.** Why does photosynthesis require in addition to water and carbon dioxide? Sunlight

**6.** What is the principal pigment of plants? Chlorophyll

**7.** Circle the letter of the region(s) of the visible spectrum in which chlorophyll absorbs light very well.

1. blue region
2. green region
3. red region
4. yellow region

**8.** Chloroplasts contain saclike photosynthetic membranes called Thylakoids

**9.** What is a granum? Stack of Thylakoids

**10.** The region outside the thylakoid membranes in the chloroplasts is called the Stroma

**11.** What are the two stages of photosynthesis called?

**a.** Light-Dependent

**b.** Calvin Cycle (Light Independent)

**12.** Complete the illustration of the overview of photosynthesis by writing the products and the reactants of the process, as well as the energy source that excites the electrons.



**14.** Circle the letter of the carrier molecule involved in photosynthesis.

 **a.** H2O **c.** CO2

 **b.** NADP+ **d.** O2

**15.** How does NADP+ become NADPH? Two electrons and a H+ are added.

**Photosystems:**



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

1. They convert ADP into ATP.
2. They produce oxygen gas.
3. They convert oxygen into carbon dioxide. Convert water into oxygen.
4. They convert NADP+ into NADPH.

**17.** Where does the light-dependent reactions take place? Thylakoid membrane

**18.** Why is it important for water to split in the light-dependent reaction? To get H+ so that NADPH can be made, e­- are created, and to get H+ in a high concentration to male ATP.

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

1. High-energy electrons move through the electron transport chain from photosystem II to photosystem I.
2. Photosynthesis begins when pigments in photosystem I (II) absorb light.
3. The difference in charges across the thylakoid membrane provides the energy to make ATP.

**20.** What are the products of the light-dependent reactions? O2, ATP, NADPH

**21.** Why is it said that the sun is the ultimate source of energy?

Starts Photosynthesis by splitting H20

**Light-Independent Reactions/ Calvin Cycle (Dark Reaction)**



**1.** Where does the Calvin cycle take place? Stroma

**2.** What happens to CO2 in the Calvin cycle? Converted into Glucose.

**3.** What are the inputs to the Calvin cycle? Where do they come from? CO2- stomata (diffuses in), ATP and NADPH come from Light-Dependent reaction.

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

1. The main products of the Calvin cycle are ~~six carbon dioxide~~ (GLUCOSE) molecules.
2. Carbon dioxide molecules enter the Calvin cycle from the atmosphere.
3. Energy from ATP and high-energy electrons from NADPH are used to convert 3-carbon molecules into ~~similar~~ (ALTERED) 3-carbon molecules.
4. The Calvin cycle uses six molecules of carbon dioxide to produce a single 6-carbon sugar molecule.

**7.** What are the products of the Calvin cycle? Glucose! (ADP +P, NADP)