Name_____ Class_____ Date _____

Section 8–3 The Reactions of Photosynthesis

(pages 208–214)

Key Concepts

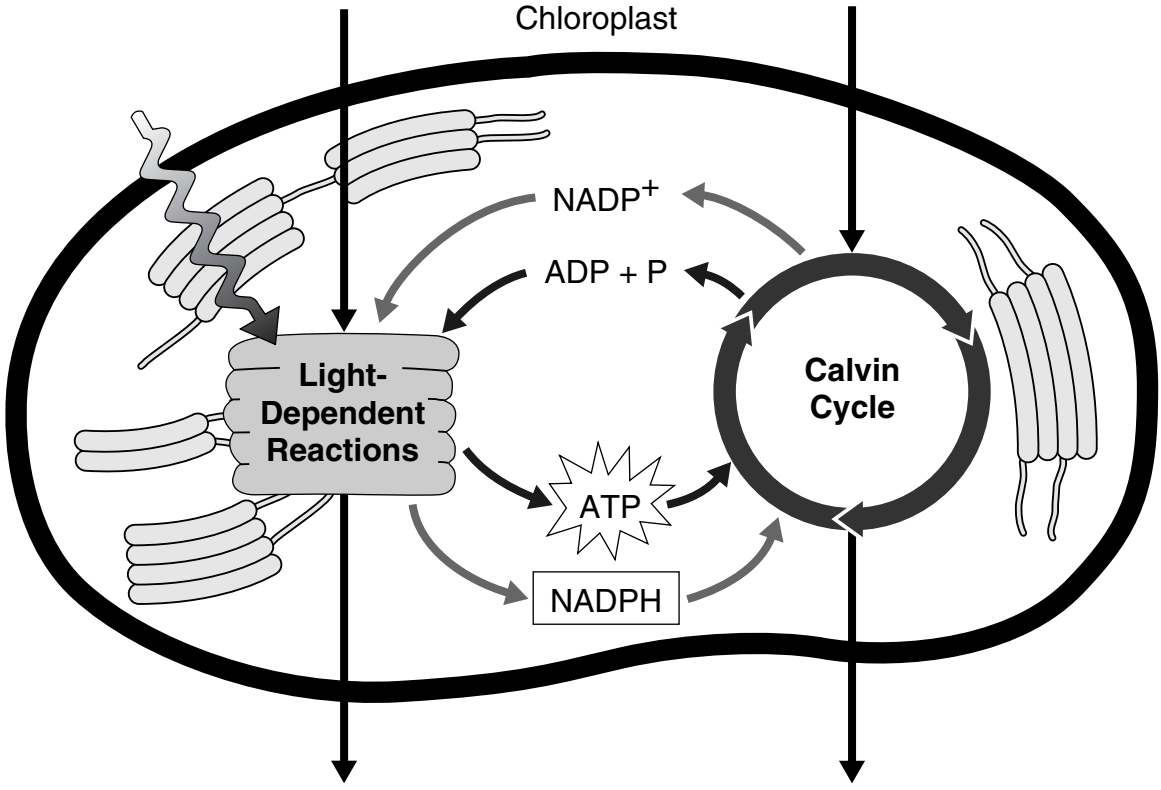
- What happens in the light-dependent reactions?
- What is the Calvin cycle?

Inside a Chloroplast (page 208)

1. Chloroplasts contain saclike photosynthetic membranes called _____.
2. What is a granum? _____

_____

3. The region outside the thylakoid membranes in the chloroplasts is called the _____.
4. What are the two stages of photosynthesis called?
   a. _____
   b. _____
5. 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.



Name_____ Class_____ Date _____

Electron Carriers (page 209)

6. When sunlight excites electrons in chlorophyll, how do the electrons change?

_____

_____

7. What is a carrier molecule? _____

_____

_____

_____

8. Circle the letter of the carrier molecule involved in photosynthesis.

a. H_2O **c.** CO_2

b. $NADP^+$ **d.** O_2

9. How does $NADP^+$ become NADPH? _____

_____

_____

Light-Dependent Reactions (pages 210–211)

10. Circle the letter of each sentence that is true about the light-dependent reactions.

a. They convert ADP into ATP.

b. They produce oxygen gas.

c. They convert oxygen into carbon dioxide.

d. They convert $NADP^+$ into NADPH.

11. Where do the light-dependent reactions take place? _____

_____

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

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.

c. The difference in charges across the thylakoid membrane provides the energy to make ATP.

d. Pigments in photosystem I use energy from light to reenergize electrons.

13. How does ATP synthase produce ATP? _____

_____

_____

_____

Name_____ Class_____ Date _____

The Calvin Cycle (pages 212–214)

14. What does the Calvin cycle use to produce high-energy sugars?

_____

_____

15. Why are the reactions of the Calvin cycle also called the light-independent reactions?

_____

16. Circle the letter of each statement that is true about the Calvin cycle.

a. The main products of the Calvin cycle are six carbon dioxide molecules.

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 higher-energy forms.

d. The Calvin cycle uses six molecules of carbon dioxide to produce a single 6-carbon sugar molecule.

Factors Affecting Photosynthesis (page 214)

17. What are three factors that affect the rate at which photosynthesis occurs?

a. _____

b. _____

c. _____

18. Is the following sentence true or false? Increasing the intensity of light decreases the rate of photosynthesis. _____