4.2 Study Guide | Overview of Photosynthesis | KEY

Directions: Answer the questions using your notes, your knowledge, and or section 4.2 from the textbook.

1. Why are some organisms called producers? What is another name for a producer?

   They produce chemical energy for themselves and other organisms. Producer = Autotroph.

2. What is the function of photosynthesis?

   To convert sunlight into sugars.

3. What is chlorophyll?

   A molecule in chloroplasts that absorbs light energy.

4. What are chloroplasts?

   Organelles where photosynthesis takes place.

5. In which two parts of a chloroplast does photosynthesis take place?

   Grana and the stroma.

6. What are thylakoids?

   Coin shaped compartments that contain chlorophyll and are found in grana.

7. Write the chemical equation for the overall process of photosynthesis.

   a. Identify the reactants, products, and the meaning of the several arrows.

Reactants Creates Products

$6H_20 + 6CO_2 \rightarrow\rightarrow\rightarrow\rightarrow\rightarrow\rightarrow 6O_2 + C_6H_{12}O_6$

8. Explain what the equation of photosynthesis means.

   Carbon dioxide and water, the reactants, enter photosynthesis.

   Through many chemical reactions…

   A six carbon sugar and oxygen are formed, the products.

9. The prefix *in-* means "not." How does this meaning tell you which reactions in photosynthesis require light, and which reactions do not?

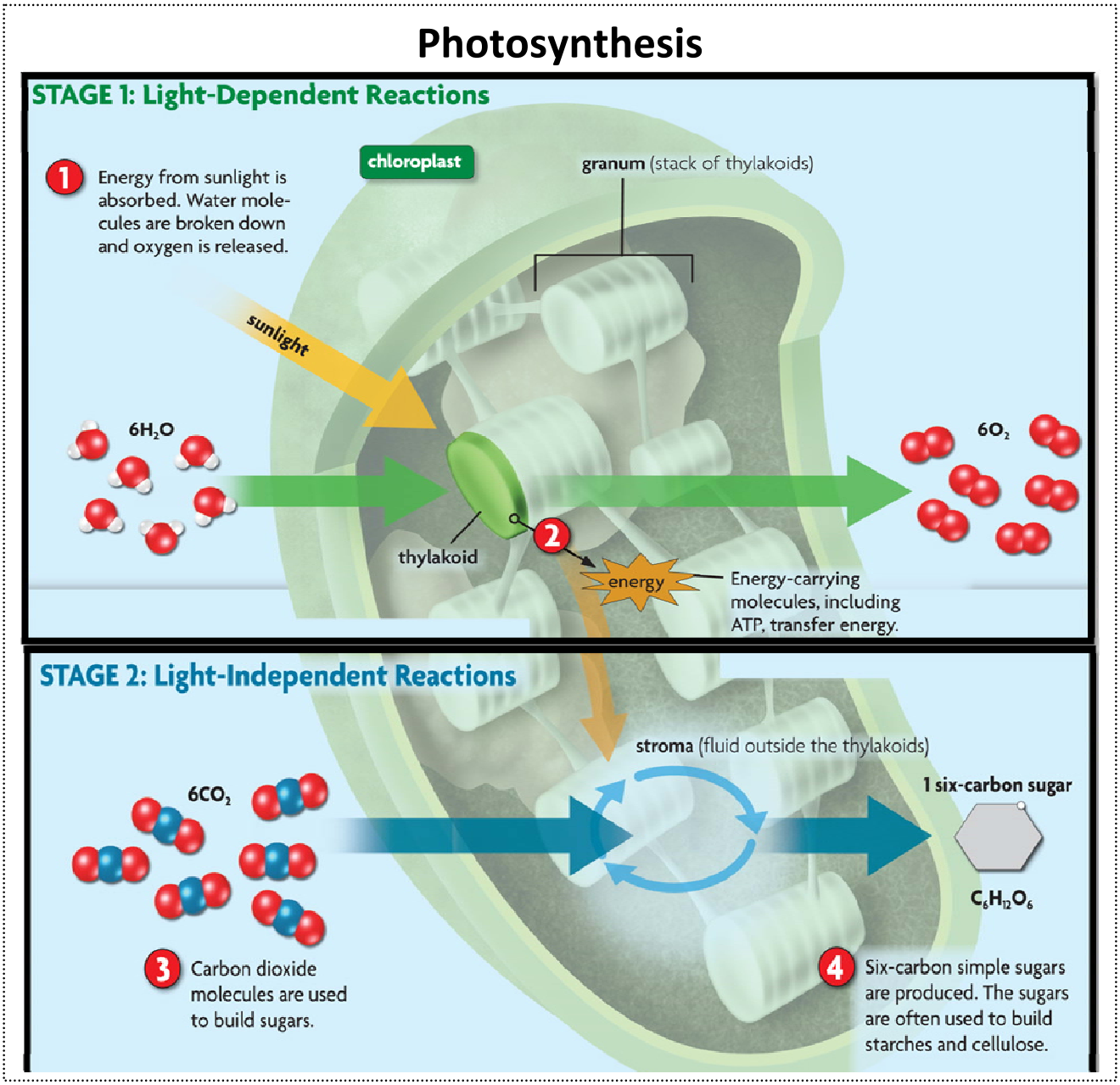
   Light (in)dependent reaction do NOT require oxygen, while light dependent reactions require oxygen.

10. What are the differences between the light-dependent reactions and the light-independent reactions?

    Light-dependent reactions: Requires sunlight & H_2O, takes place in thylakoids, creates O_2 & some ATP.

    Light-independent reactions: Does NOT require sunlight, requires CO_2, takes place in the stroma, creates sugars.

11. Sketch and **label** a chloroplast with the following:
    a. Reactants, products, & structures (grana, thylakoids, stroma).



12. List the 4 steps of photosynthesis that take place in the chloroplast.
    a. **Sunlight absorbed, water taken in and broken down, oxygen is released.**
    b. **Energy carried along the thylakoid membrane to the stroma.**
    c. **Carbon dioxide taken in.**
    d. **Sugar created.**
13. The prefix *photo-* means "light" and *synthesis* means "to put together." How do those meanings tell you what happens during photosynthesis? **Light helps to put sugars together.**
14. The prefix *chloro-* means "green" and the suffix *–phyll* means "leaf". How are these meanings related to chlorophyll? **Chlorophyll is a light absorbing molecule that is found in plant leaves and makes them look green. Remember chlorophyll reflects green light and absorbs all the rest.**