**6-1 Photosynthesis** **Reading Check (113-117)**

1. In your own words, briefly describe the experiments that contributed to the understanding of photosynthesis

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| Jan Van Helmont - Experiments in Photosynthesis 3AJan Van Helmont Experiment:  Conclusion: |
| Photosynthesis I | Biology | Visionlearning  Joseph Priestly Experiment:  What was his conclusion? |

**Fill in the blanks**:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are organisms that can make their own food.
2. An organism that obtains energy by eating food: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. A green pigment that is involved in light absorption for photosynthesis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ performed an experiment that showed that plants produce a gas that allows a candle to burn.
5. The most important energy-storing compound is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Explain how ATP stores and release energy.

**6-2 Reading Check** (p118-123)

1. Production of NADPH and ATP requires sunlight. The series of reactions that produces there energy-storing compounds are known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The second stage of photosynthesis does not require light and is therefore called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. This 2nd stage uses the energy stored in NADPH and ATP to produce \_\_\_\_\_\_\_\_\_\_\_\_\_. Why is this substance produced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Light Reactions can be divided into four basic processes:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ take place within saclike \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are located inside an organelle called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
2. Sunlight is capture by clusters of pigment molecules called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that contain serval hundred \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules as well as a number of accessory pigments.
3. Electrons are passed from one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the next during the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is “split” to produce hydrogen ions, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that replace those lost by chlorophyll.
5. An enzyme uses the energy created by a difference in charges across a membrane to add a (an) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ group to ADP to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. The light reactions use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. In the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or Calvin Cycle, the energy from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ produced in the light reactions is used to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into PGAL and other biologically important molecules.
8. In the first reaction of the Calvin cycle, which is catalyzed aby the enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a 5-carbon sugar combines with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
9. Compare light and dark reactions in terms of substances used, products made and where they occur.

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|  | Light | Dark |
| Light requirement |  |  |
| Reactants |  |  |
| Products |  |  |
| Where they occur |  |  |

1. Write out the balanced chemical equation for photosynthesis.
2. If molecules have equal numbers of protons and electrons, how can a molecule of chlorophyll continue to exist in the photosynthetic membrane if chlorophyll molecules continually lose high-energy electrons to the electron transport chain? (Hint: look at the reactants in the basic equation)