**Photosynthesis WS** (Chapter 6)

1. Describe the experiments that contributed to the understanding of photosynthesis.

Fill in the blanks using the word bank. ***Not all words will be used****:* Higher, Autotrophs, heterotrophs, red, green, blue, carrier, white, electrons, transferred, enzymes, molecules, ATP, phosphate, thylakoid, broken, formed.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are organisms that can make their own food.
2. Chlorophyll a and b absorb \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ wavelengths of light.
3. Photosynthesis begins when the energy from light is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in matter.
4. The electrons are raised to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy level.
5. High-energy electrons are passed to an *electron \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecule* called NADP+.
6. The second way energy is stored is in the form \_\_\_\_\_\_ the energy molecule of the cell.
7. Energy is released when the last \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond is broken.
8. The breakdown of ATP is controlled by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
9. Draw and label a diagram of a chloroplast. Include double membrane, stroma, thylakoid, granum. Indicate where light reactions and dark reactions take place.
10. Compare light and dark reactions in terms of substances used, products made and where they occur.

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

1. Write out the balanced chemical equation for photosynthesis.
2. If molecules of atoms and all atoms 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)
3. What is an Electron transport chain? What is the purpose?