PHOTOSYNTHESIS WORKSHEET

1. a) Write the formula for photosynthesis. (Don't forget what goes OVER the arrow)

b) Write in words what the products and reactants of photosynthesis are.

2. What group do organisms that can photosynthesize fall under?

3. What group do organisms that must rely on cellular respiration fall under?

4. a) What plant organelle does photosynthesis take place in?

b) What pigment do chloroplasts contain? What color is it?

c) What is one flattened sac of the chloroplast membrane called? (one pancake)

d) What is a stack of flattened sacs called? (stack o' pancakes)

e) Which reactions of photosynthesis take place here?

f) What is the protein-rich fluid that surrounds the flattened sacs called? (gooey syrup)

g) Which reactions of photosynthesis take place here?

5. What is an electron transport chain?

6. What are the three products of the light reactions?
7. Describe, in your own words, what happens in photosystem I. What is the product that is formed?

8. Describe, in your own words, what happens in photosystem II. What are the two products that are formed?

9. What is the product of the dark reactions, or the Calvin Cycle?

10. **Complete the following paragraph about the Calvin Cycle.**

   The dark reactions of photosynthesis occur in the ______________. In the first step, _____ from the atmosphere enters the plant. It combines with _______ to form _______. In the second step, the PGA uses energy _______ from _____ as well as _______ to form ___________. In the third step, some of the PGAL forms ___________. In the final step, the rest of the PGAL uses energy from ATP to make new molecules of ___________ which continues the cycle.

11. What is the advantage of using the C₄ pathway?

12. a) What types of plants use the CAM pathway?

   b) Why are their 'dark reactions' truly dark reactions?

   c) What is the advantage of only opening the stomata at night?
Matching
Match each term with its description below. Write the letter of the correct term on the line provided.

a. thylakoid
b. chlorophyll
c. NADP+
d. pigment
e. photosynthesis
f. ATP synthetase

11. molecule that absorbs certain wavelengths of light
12. photosynthetic membranes that contain photosystems
13. molecule that carries electrons
14. principal pigment found in plants
15. process by which autotrophs convert sunlight to a usable form
16. protein found in thylakoid membrane that allows hydrogen ions to pass through it

Labeling Diagrams
On the lines provided, write the names of the substances that correspond to the numbers in the drawing of the overview of photosynthesis below.

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Defining Terms
On the lines provided, write a definition for each of the following terms:

1. ATP

2. thylakoid

3. NADP+

4. ATP synthetase

5. Calvin cycle

Answering Questions
On the lines provided, write an answer to each question.

6. What is the difference between ATP and ADP?

7. How do the light-dependent reactions differ from the Calvin cycle?

8. What is a chloroplast?

9. In which stage of photosynthesis is oxygen produced?

10. What compound is formed from carbon dioxide in the Calvin cycle?
Name: ____________________________

Name all of the following parts:

1. ____________________________________________  5. __________________________
2. ____________________________________________  6. __________________________
3. ____________________________________________  7. __________________________
4. ____________________________________________  8. __________________________
9. ____________________________________________

Name the three parts of the leaf where photosynthesis occurs:

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________