



Name: _____ Date: _____ Group: _____

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Photosynthesis

Background

1. What interaction between matter and energy occurs during the process of photosynthesis?

2. How does radiant energy become food for a plant?

3. Put the meaning of the Greek origin words “synthesis” and “photo” together to explain the meaning of the word “photosynthesis.”

Part I: The Reactants

1. How many hydrogen atoms in total appear as any part of the reactants? _____
2. How many carbon atoms in total appear as any part of the reactants? _____
3. How many oxygen atoms in total appear as any part of the reactants? _____
4. What is the source of the carbon dioxide as a reactant in photosynthesis? _____
5. How does carbon dioxide enter the plant? _____
6. What is the source of water as a reactant in photosynthesis? _____
7. How does the water enter the plant? _____

Part II: Energy Transformation

1. What acts as the radiant energy collector in a plant? _____
2. What part does chlorophyll play in the photosynthesis process? _____

3. After the transformation from radiant energy, where is the chemical energy stored?

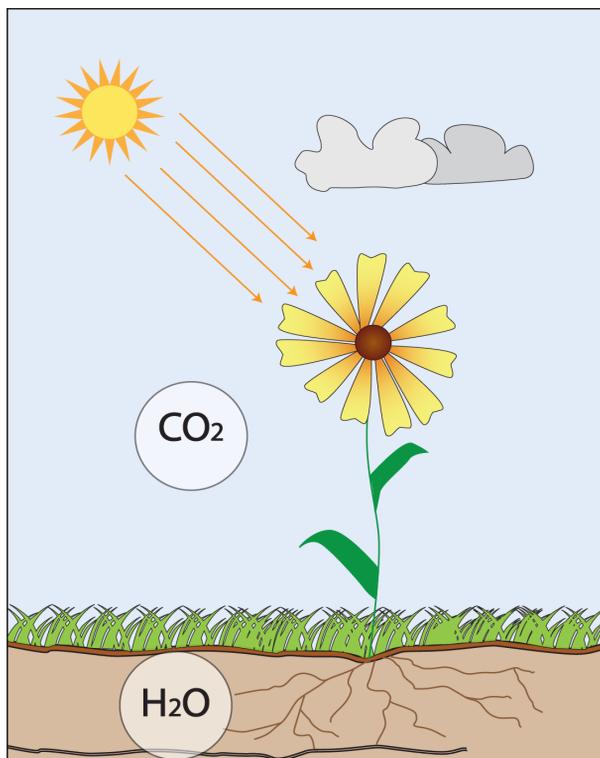
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Part III: The Products

1. How many hydrogen atoms in total appear as any part of the products? _____
Were any hydrogen atoms gained or lost as a result of photosynthesis? _____
2. How many carbon atoms in total appear as any part of the products? _____
Were any carbon atoms gained or lost as a result of photosynthesis? _____
3. How many oxygen atoms in total appear as any part of the products? _____
Were any oxygen atoms gained or lost as a result of photosynthesis? _____
4. Are all of the atoms used to create the glucose? _____
5. Why does it make sense to call oxygen a by-product of photosynthesis?

6. Explain how the model shows storage of chemical energy.

7. Add arrows and additional labels to the picture below to demonstrate the information you learned in this activity about photosynthesis including the energy involved in the process.



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Reflection and Conclusions

1. What role does the Sun's energy play in the process of photosynthesis?

2. Is matter created or destroyed during the photosynthesis process? Explain your answer.

3. How do humans benefit from plants going through photosynthesis?

4. Do you think the process of photosynthesis only occurs one time in a plant leaf?

5. Use your understanding of photosynthesis to follow and describe how carbon ends up in the stomach of a rabbit. Include where carbon enters the process and what form it is in as well as the steps of what happens to the carbon throughout the process.

6. Plants are frequently classified as Producers because of the process of photosynthesis. Explain why this is an appropriate title.

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Reflection and Conclusions, continued

7. Predict what would happen on Earth if an explosive action, for example, an asteroid crash forced material into the atmosphere such that the amount of radiant energy was significantly reduced for many years.

8. Review the model you created with the plastic chips. Count the number of carbon dioxide stacks that were reactants. Count the number of water stacks that were reactants. Count the number of oxygen stacks that resulted as products. Record below:

_____ water H_2O
 _____ carbon dioxide CO_2
 _____ oxygen O_2
 1 glucose $C_6H_{12}O_6$

Use the numbers above to fill in the symbolic photosynthesis reaction below:

