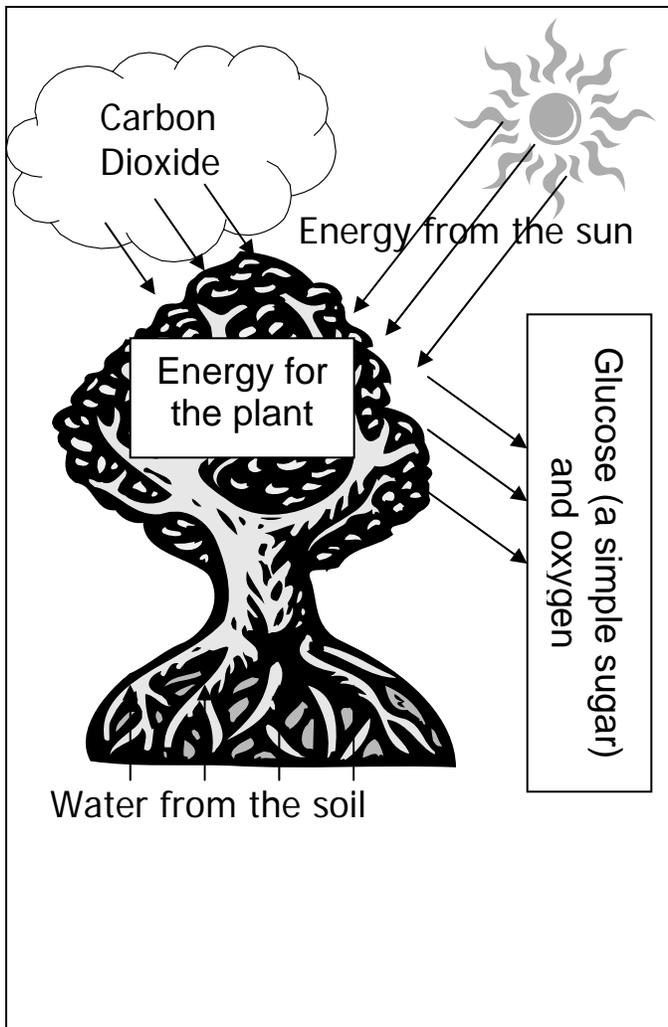
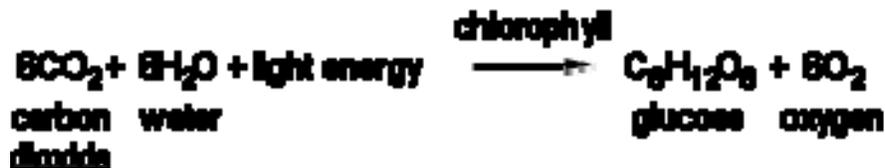


Name _____

Evidence of Photosynthesis

Background Information: PHOTOSYNTHESIS is the process during which a plant's chlorophyll traps light energy and sugars are produced. In plants, photosynthesis occurs only in cells with chloroplasts. The chemical reaction for photosynthesis is:



Green plants use energy from light to combine carbon dioxide and water to make food. Light energy is converted to chemical energy and is stored in the food that is made by green plants. The light used in photosynthesis is absorbed by a green pigment called chlorophyll. Each food-making cell in a plant leaf contains chlorophyll in small cells called chloroplasts. In chloroplasts, light energy causes water drawn from the soil to split into molecules of hydrogen and oxygen. In a series of chemical reactions, the hydrogen combines with carbon dioxide from the air, forming a simple sugar. Oxygen from the water molecules is given off in the process. From sugar, along with nutrients from the soil, green plants can make starch, fat, protein, vitamins, and other complex compounds necessary for life. Photosynthesis supplies the chemical energy needed to produce these compounds.

When a person exhales, carbon dioxide is released. Bromothymol blue solution, BTB, can indicate the presence of carbon dioxide in the water. When little or no carbon dioxide is present, BTB will show a blue color. Depending upon the amount of carbon dioxide, BTB will change to green or yellow. Yellow indicates more carbon dioxide.

Materials:

3 test tubes with caps	Bromothymol Blue solution	Light source
Beaker	Straw	Foil

Procedure:

1. Place 75 ml of bromothymol blue in a beaker.
2. Observe the color of the solution.
3. Introduce carbon dioxide into the solution. Use a straw from to **slowly** blow carbon dioxide from your lungs into the solution until it **just turns yellow**.
4. Pour the solution into three screw cap test tubes, dividing it evenly.
5. Get one 6 cm piece of *Elodea*, place it in one of the tubes, and cap it.
6. Get two 6 cm pieces of *Elodea*, place it in a second tube completely covered with foil (to prevent light from reaching the solution & *Elodea*), and cap it. In both of these test tubes, be sure the plant is completely submerged in the solution.
7. Cap the test tube that has no plant in it.
8. Place the test tubes into a beaker of water and put the beaker about 250 cm from a lamp.
9. Allow the plants to sit undisturbed for overnight.
10. Compare the colors of the solutions by removing the plants and holding the tubes in front of a white background. Record the final colors of all three tubes.
11. After all measurements have been completed, rinse out your glassware.

Data:

Observations of Test Tubes					
Test Tube 1 BTB Solution & Elodea; Uncovered		Test Tube 2 BTB Solution & Elodea; Covered		Test Tube 3 BTB Solution; Uncovered	
Start	After 24 hrs	Start	After 24 hrs	Start	After 24 hrs

Data Analysis:

1. Which test tube(s) showed a color change in this investigation?
2. What does a color change indicate in this investigation?

Questions:

1. What is the independent variable in this investigation?
2. What is the dependent variable in this investigation?

