Photosynthesis Lab

(Adapted from *DIY Science: Illustrated Guide to Home Biology Experiments* pg. 158-159)

During photosynthesis, carbon dioxide is consumed and oxygen is produced. For this lab, we will be using a chemical indicator (Bromothymol blue) (pronounced bruh-mah-THI-mol) in order to physically see the carbon dioxide intake by plants. Bromothymol blue turns yellow in slightly acidic solutions and blue in slightly basic solutions. When carbon dioxide is put in water, a slightly acidic solution is formed and as it is used up, the solution becomes more basic. In this procedure, we will test whether the presence of sunlight is required for aquatic plants to use carbon dioxide.

**Pre Lab Questions**

1. What is our scientific question being investigated?
2. Write a hypothesis that attempts to answer this scientific question.
3. What is needed for photosynthesis to occur? What are the products of photosynthesis (please write this as a chemical equation with correct stoichiometry)?
4. How will we tell that photosynthesis is actually occurring in this experiment?

**Materials**

* 3 Test tubes
* Aquatic plant life
* Soda Straw
* Bromothymol Blue solution

**Methods**

1. At your lab stations, there are 3 test tubes. Please label 1 test tube sunlight, 1 dark, and 1 ambient light.
2. Fill the small beaker with 30ml of the prepared bromothymol blue solution located on the front lab station.
3. Use the soda straw to blow bubbles (gently) into the solution in the beaker until it turns yellow. **DO NOT SUCK ANY OF THE SOLUTION INTO YOUR MOUTH!** Make sure that all the solutions are the same color. This can be done by measuring the amount of time it takes to turn the first solution yellow and blowing bubbles for that exact amount of time in the other 2 solutions.
4. Equally distribute the, now yellow, solution in the test tubes.
5. Place equal amounts of aquatic plants into each test tube.
6. Place the test tube labelled sunlight under the grow light, the test tube labelled dark in the appropriate cupboard, and leave the test tube labelled ambient light at your lab station.
7. Create a table to monitor progress every 5 minutes for 30 minutes.

**Results**

1. Finish table
2. What happened to the color in each test tube?

**Conclusions**

1. Which test tube had the most dramatic change in color? Why?
2. Was your hypothesis correct?
3. What would you do differently in this experiment if you were to perform it again?
4. If you were to add another variable to this experiment, what would you add and why?
5. Why are your results different from other groups?