**Modeling module for Biology Standard 3.1**

**Demo: BTB and Photosynthesis - What Gases Do Living Organisms Consume and Give off?**

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**Teacher notes:**

1. Present 3 to 4 containers of prepared samples to class. (Sample 1- Distilled Water with BTB, Sample 2- 1, 6cm Elodea in BTB Solution, Sample 3- 2, 6cm Elodea in BTB Solution, Sample 4- Snail in BTB Solution)
2. Have students white board predictions in small groups about what they think will happen to each sample when these containers are put under light for 24 hours. (Tell students BTB in the solution allows us to see a change)
3. 1 day later: Have students’ whiteboard results and predict what occurred. Follow with class discussion.

**To make Samples:**

**Procedure**:

1. Place 150 ml of distilled water in a beaker. Place 3 ml 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.