**Cellular Respiration and Photosynthesis Lab**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_

**OBJECTIVES:**

Demonstrate the processes of cellular respiration and photosynthesis. Examine the products of these processes through the use of chemical indicators. Understand the interdependence of photosynthesis and cellular respiration in living organisms.

**BACKGROUND:**

When carbon dioxide combines with water, it forms a weak acid called carbonic acid. Bromothymol blue (BTB) indicator indicates the presence of carbonic acid by turning yellow or green. When no carbon dioxide is present, it is blue.

**MATERIALS:**

4 test tubes

4 test tube lids

1 straw

1 beaker

2 Elodea sprigs (water plant)

1 test tube rack

Tin foil

Tape

Bromothymol blue indicator

Procedures:

1. Pour 400 ml of Bromothymol blue into the beaker.

2. Have a group member take the straw and blow into the BTB until there is a color change to

 green/yellow.

3. Place tape on the test tubes and label the test tubes A, B, C, D.

4. Place an Elodea sprig in test tube C and D.

5. Pour the color changed BTB equally into the four test tubes, fill enough to cover the

 Elodea sprigs.

6. Place the four test tube lids on the test four test tubes.

7. Wrap test tube B and D completely with tin foil.

8. Place the test tubes into the test tube rack and put them under the light source.

Come back to your specimens in 24/48 hours.

9. After 24/48 hours uncover the tin foil from test tubes B and D. Record your observations.

10. Clean up all supplies as instructed.

Prediction:

What will happen to test tubes B and D, which are wrapped with tin foil, as they are exposed to light?

IF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Data:

|  |  |  |  |
| --- | --- | --- | --- |
| **TUBE** | COLOR BEFORE | COLOR AFTER | ADDITIONAL OBSERVATIONS |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |
| D |  |  |  |

Analysis:

1. Which of the test tubes containing BTB changed color over the 24-hour period?

 Explain why.

2. Which of the test tubes containing BTB did not change color over the 24-hour period?

Explain why.

3. What were the reactants and the products of test tube A and C?

4. What evidence do you have to explain the products in test tube C?

5. Identify the benchmark control, the thing that can be compared back to, and explain what this control is and how it was used in this experiment.

6. Draw a model to demonstrate how photosynthesis and cell respiration occur from the experiment. Your model should include: DRAWINGS, LABELS, ANY SEEN AND UNSEEN FORCES, AND EXPLAIN WHAT IS OCCURING.