## Explore: Mystery Solutions and Bromothymol Blue



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## **Objective:**

To observe how different liquids affect the color of bromothymol blue and understand the role of photosynthesis and respiration.

## **Materials:**

- Bromothymol blue liquid
- Test tubes
- Water
- Vinegar
- Baking soda mixed with water
- Plant in water
- Carbonated soda (e.g., soda pop)
- Straw or dropper for mixing
- Safety goggles

## Procedure:

- 1. Observations: Look at the starting color of each liquid (water, vinegar, baking soda mixed with water, plant in water, carbonated soda) in the test tubes.
- **2. Guess**: Predict which liquids will change the color of bromothymol blue and explain why.
- 3. About Bromothymol Blue: Bromothymol blue changes color based on how acidic or basic a liquid is. When there's carbon dioxide (CO2) in a liquid, it turns yellow. This happens because CO2 mixes with water and makes a weak acid. In photosynthesis, plants use CO2 and make oxygen (O2), which can turn the bromothymol blue back to blue. In respiration, animals use O2 and make CO2, which turns the bromothymol blue yellow.



- **4. Experiment**: Put a few drops of bromothymol blue in each test tube with a different liquid. Watch and write down any color changes.
- 5. Data Collection:



- 6. Analysis/Conclusion: Think about what you saw and answer these questions:
  - 1. What happened to the color of bromothymol blue with each liquid?
    - The color changed to \_\_\_\_\_\_ with \_\_\_\_\_\_.

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- 2. Which liquids made bromothymol blue change color, and why do you think that happened?
  - The liquids that made the color change were \_\_\_\_\_ because

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- 3. How are your findings connected to photosynthesis and respiration?
  - My findings are connected to photosynthesis and respiration because

- 4. What can you say about how carbon dioxide affects the color of bromothymol blue?
  - I can say that \_\_\_\_\_.

- 5. How would you change the experiment to learn more about photosynthesis and respiration's effects on bromothymol blue?
  - To learn more, I would \_\_\_\_\_.

Safety Note:

Name:	

Date: \_\_\_\_\_

• Wear safety goggles to protect your eyes from spills.