Metabolic Rates and the Carbon Cycle

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Reagents

* 10 beakers (50 mL each)
* 4.5 mL CO₂ indicator solution (per beaker)
* 10 algal beads (per designated beaker)
* Freshwater aquatic snails (1 or 2 per designated beaker)
* Parafilm
* Aluminum foil
* Light source (30 cm distance lamps)

Experiment Summary

The goal of this lab is to examine the relationship between photosynthesis, cellular respiration, and carbon cycling in an aquatic environment. To accomplish this, we will set up 10 different beakers containing various combinations of algal beads, snails, and CO₂ indicator solution. Some breakers will be placed under a light source to facilitate photosynthesis, while others will be kept in the dark to focus on cellular respiration.

We will record the initial pH of each solution and continue measuring pH every five minutes for 45 minutes. Since CO₂ lowers pH by forming carbonic acid in water, we expect to observe color changes in the indicator solution based on CO₂ consumption (due to photosynthesis) and CO₂ production (from respiration). This experiment will help us understand how these biological processes interact and contribute to the carbon cycle.