

Name: _____ Period: _____

LAB 9: MEASURING THE RATE OF PHOTOSYNTHESIS

PRE-LAB QUESTIONS:

1. Give the general reactants and products of the photosynthesis reaction:

2. Photosynthesis has limiting factors:
 - A. In general, what is a limiting factor?

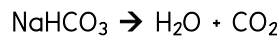
 - B. Give two limiting factors for photosynthesis. For each, describe WHY each is a limiting factor for the reaction.
 - 1)

 - 2)

3. Identify the following variables for this experiment:
 - A. Independent Variable
 - B. Dependent Variable
 - C. 4 Controlled Variables

THE BIG IDEA FOR THIS LAB IS TO INDIRECTLY MEASURE THE AMOUNT OF O₂ GAS PRODUCED. THE MEASUREMENT OF O₂ IS INDIRECT BECAUSE WE ARE MEASURING THE NUMBER OF RISING LEAF DISCS, NOT THE ACTUAL O₂ AMOUNT. BUT IT IS ASSUMED THAT A CERTAIN AMOUNT OF O₂ MOLECULES ARE NEEDED TO RAISE A LEAF DISC TO THE WATER'S SURFACE BY THE PHOTOSYNTHESIS REACTION, AND THAT THIS AMOUNT IS THE SAME FOR ALL LEAF DISCS. IF O₂ IS BEING PRODUCED AT A MEASURABLE RATE, THEN IT CAN BE ASSUMED C₆H₁₂O₆ (GLUCOSE) IS ALSO BEING PRODUCED AT THE SAME RATE IN THE REACTION.

NOTE! CO₂ is dissolved in the water because sodium bicarbonate (baking soda) results in this chemical reaction



DATA COLLECTION:

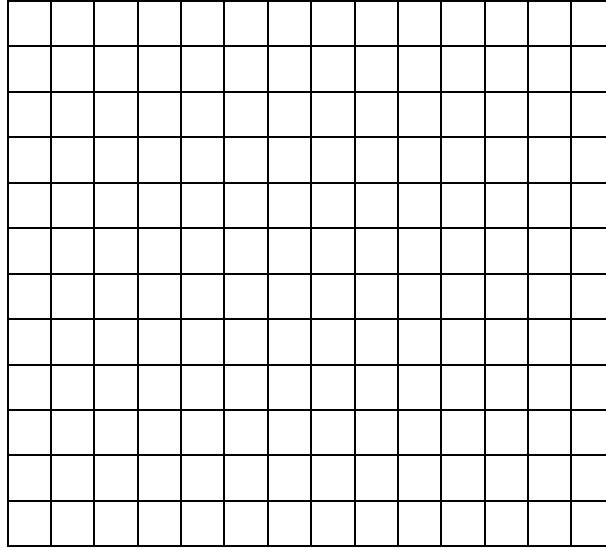
Time (min)	Number of Leaf Discs That Rise With & Without CO ₂	
	Water With CO ₂ (Experimental Group)	Water Without CO ₂ (Control Group)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

DATA ANALYSIS GRAPH:

This is a **TWO LINE** graph! Graph a line for **WITH** and a line for **WITHOUT**!

Be sure to label your x and y axes with your independent & dependent variables!

Y-Axis:



Graph Key:

- With CO₂
- WithOUT CO₂

X-Axis:

POST-LAB QUESTIONS:

1. In this experiment, what was the limiting factor? How did it limit the rate of photosynthesis?

2. How does this experiment measure the rate of photosynthesis? (Hint: think about what is produced in photosynthesis that was needed to move the leaf discs!)

3. Did any leaf discs float in the cup without CO₂? If yes, what might explain this (consider your experimental setup)? If no, explain why the discs were unable to float.