

Name: \_\_\_\_\_

## Photosynthesis Lab

Website: <http://www.kscience.co.uk/animations/photolab.htm>

Notice that there are 4 things you can control in the simulation (scan your mouse over each object): temperature (10→40), light intensity (5→45), amount of CO<sub>2</sub>, and color of light (white, orange, green, blue).

**Observation:** Many different factors can affect the rate of photosynthesis such as temperature, light intensity, levels of CO<sub>2</sub>, and wavelengths (color) of light.

**Problem:** How do the following factors affect the rate of photosynthesis?

**Hypothesis:** (Circle the level of each factor that you think will be most favorable for photosynthesis)

Temperature (T)	Light Intensity (I)	Amount of CO <sub>2</sub> (C)	Color of Light (L)
10 25 40	5 10 15 20 25 30 35 40 45	Less More	White Orange Green Blue

### Experiment & Data:

*Materials* – list the materials needed to run the experiment (include tools)

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*Setup* – Is there an experimental group and control group in this setup? If so, identify.

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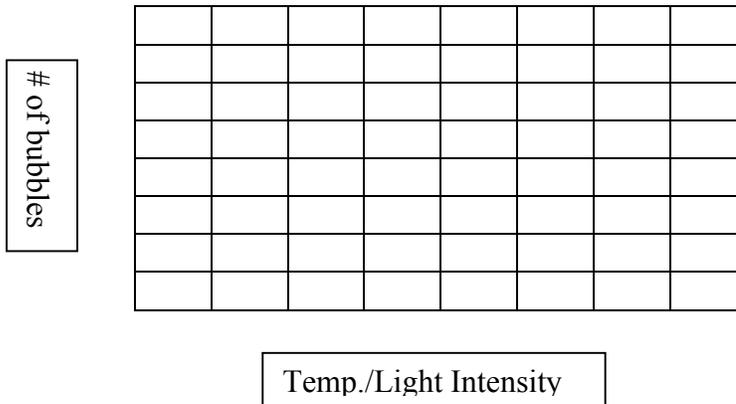
*Procedure:*

**Part I.** Read this section first and see the table below *before* beginning the task! Start out by setting each factor to the lowest setting using white light; press the green button to start the clock and count how many bubbles are produced in 30 seconds. Then adjust the factors to the average setting (but the keep the light as white) and repeat the process. Finally, adjust the factors to the highest setting (but the keep the light as white) and repeat the process. Record the number of bubbles into the data chart below.

Settings	# bubbles in 30 seconds
Lowest (T=10, I=10, C=less*, L=white)	
Average (T=25, I=25, C=less*, L=white)	
Highest (T=40, I=40, C=less*, L=white)	

\* If the bottle of CO<sub>2</sub> is full then less has been poured into the cup with the plant; a half-filled CO<sub>2</sub> bottle is more CO<sub>2</sub>.

Plot the data from the table into the graph below (line graph).



What does the data show about how temperature and light intensity affect the rate of photosynthesis? (Start off with “As the.....”)

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**Part II.** Figure out a way to test how the amount of CO<sub>2</sub> affects the rate of photosynthesis. Describe your test:

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Amount of CO <sub>2</sub>	# of bubbles
Less	
More	

What does the data show about how CO<sub>2</sub> affects the rate of photosynthesis? (Start off with “As the.....”)

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**Part III.** Keep the highest setting (T=40, I=45, C=more\*) for each factor and now alter the color of light. Record the number of bubbles produced as the color of light changes in the data table below.

Color of Light	# bubbles in 30 seconds
White	
Orange	
Green	
Blue	

Which color of light was most favorable for photosynthesis? Least favorable?

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**Part IV.** Design your own conditions for 3 different tests and count the # of bubbles in 30 seconds; record below. Make sure you test out your hypothesis as one of the 3!

Conditions	Conditions	Conditions
T =	T =	T =
I =	I =	I =
C =	C =	C =
L =	L =	L =
# bubbles =	# bubbles =	# bubbles =

Explain the data you observed:

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What do the bubbles represent? \_\_\_\_\_

**Conclusion:** Did you prove your hypothesis? Explain how you know (be sure to discuss all 4 factors!)

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