**Waterweed Photosynthesis Simulation** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Introduction: In this simulation, you will be looking at the production of a gas as a plant (the waterweed) photosynthesizes. The consumption of this gas is measured in the number of bubbles produced by the plant.

Go to [www.saddleworth.oldham.sch.uk/science/simulations/waterweed.htm](http://www.saddleworth.oldham.sch.uk/science/simulations/waterweed.htm)

**Effect of Light Color on the Rate of Photosynthesis**

Set the simulator to 6.0 Light level and 6.0 CO2 level. Adjust the colors to complete the following table.

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| --- | --- |
| Light Color | # of Bubbles1. Based on the data, what color of light results in the fastest rate of photosynthesis?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Light=6.0, CO2=6.0) |
| Red |  |
| Blue |  |
| Green |  |
| Colorless |  |

**Effect of Varying Light Levels on Photosynthesis**

Set the simulator to Colorless Light and 6.0 CO2 Level. Make adjustments to the level of light to complete the table.

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| Light Level | # of Bubbles(Light = Colorless, CO2=6.0)2. Based on the data, which light level results in the fastest rate of photosynthesis?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 0.0 |  |
| 2.0 |  |
| 4.0 |  |
| 6.0 |  |
| 8.0 |  |
| 10.0 |  |

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3. Use the data on light level and # of bubbles to create a line graph in the space to the left.

4. State the relationship between the light level and production of gas by waterweed.

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5. Identify the independent variable in this investigation.

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6. Identify the dependent variable in this investigation.

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**Effect of Varying CO2 Levels on Photosynthesis**

 Set the simulator to Colorless Light and 8.0 Light level. Make adjustments to the level of CO2 to complete the table.

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| CO2 Level | # of Bubbles7. Based on the data, what CO2 level results in the fastest rate of photosynthesis?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_( Light = Colorless, Light Level = 8.0) |
| 0.0 |  |
| 2.0 |  |
| 4.0 |  |
| 6.0 |  |
| 8.0 |  |
| 10.0 |  |

8. Use the data on CO2 level and # of bubbles to create a line graph below.

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9. State the relationship between the CO2 level and production of gas

by the waterweed.

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Conclusion Questions

10. Based on the simulation experiments, state 3 factors that can affect the rate of photosynthesis in a plant.

11. Write the equation for photosynthesis.

12. What part of the equation do the bubbles you measured in the lab represent? Why do the bubbles tell you how fast photosynthesis is occurring?

13. Why is it important that you keep two variables constant (such as light level and color) while you are testing how a third variable (like CO2) affects photosynthesis?

14. What settings would you put the simulator on to get the **maximum** rate of photosynthesis?