

Name _____ Date _____ Class _____

Photosynthesis Virtual Labs

***Go ahead and open up ALL links...some of them take a while to load.

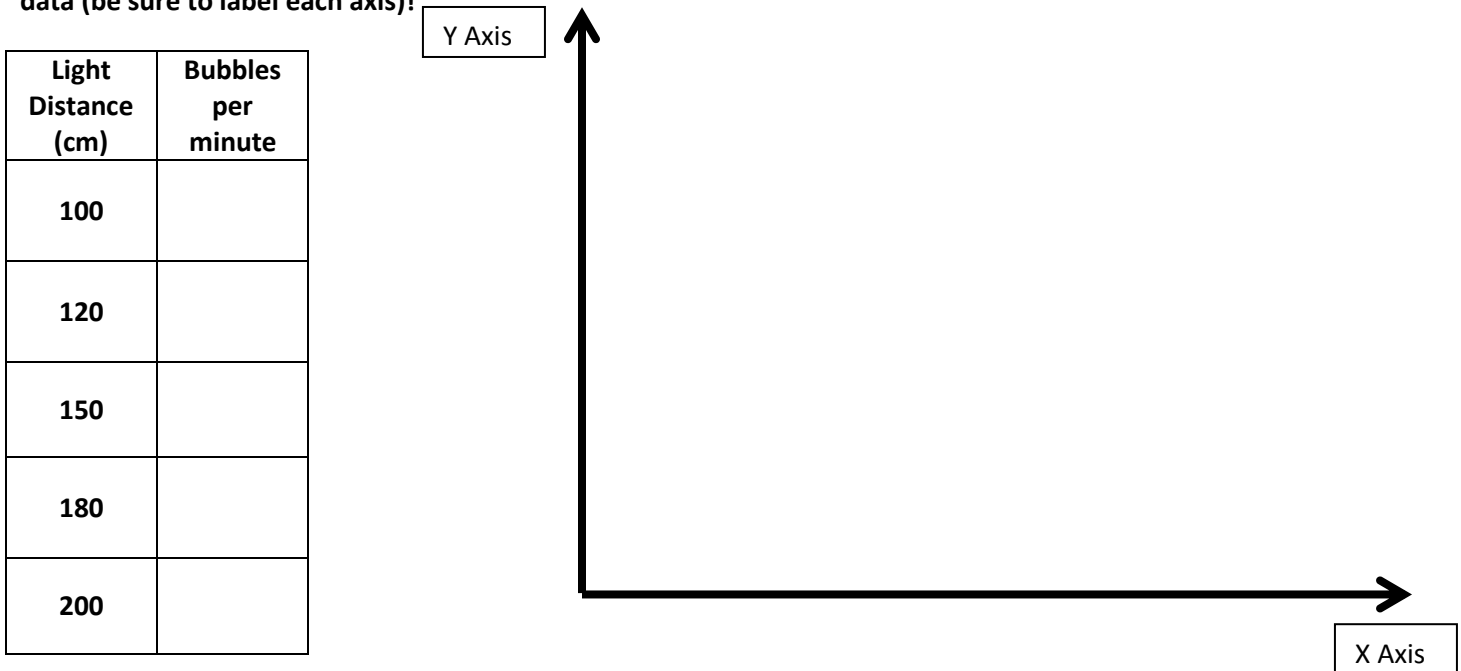
Tutorial: http://www.harcourtschool.com/activity/science_up_close/512/deploy/interface.html

Watch and listen to the tutorial found in the link above. Fill in the following answers as you watch. Stop and replay anything you don't understand – this is a complicated topic!

1. Plants use photosynthesis to make _____ for the plant.
2. What do plants **need** in order to perform photosynthesis?
3. How is the plant able to **obtain** each "ingredient?"
4. Identify the plant cell **organelle** in which photosynthesis takes place.
5. **Summarize** the process of photosynthesis.
Water and carbon enter the chloroplast.....
6. What happens to the **oxygen** that is produced as a result of photosynthesis?
7. Why is photosynthesis also important for **people and animals**?

Virtual Lab #1 - <http://www.reading.ac.uk/virtualexperiments/ves/preloader-photosynthesis-full.html>

Bubbles are given off by the plant through photosynthesis. By measuring the rate at which the bubbles are produced it is possible to tell how fast the plant is photosynthesizing. Read and follow the directions on how to use this lab simulator. Press start and record the bubbles per minute for each of the following light distances. Then graph your data (be sure to label each axis)!



8. Based on your data, draw a conclusion regarding how **light intensity** affects the rate of photosynthesis.

Virtual Lab #2 - <http://www.kscience.co.uk/animations/photolab.swf>

In this lab, you will be experimenting with how different variables affect the rate of photosynthesis.

9. Set the **thermometer to 25°C** (Room Temperature) and the **light intensity to 20**.

- What were the bubbles per minute at this setting? _____ **bpm**
- Now increase the CO₂ available to the elodea. What were your bubbles per minute? _____ **bpm**
- Based on your data, how does the amount of **available CO₂** affect the rate of photosynthesis?

10. Keep your settings from 9c (**25°C, light intensity of 20, increased CO₂**).

- a. What were the bubbles per minute at this setting? _____ **bpm**
- b. Now increase the temperature to 40°C. What were your bubbles per minute? _____ **bpm**
- c. Based on your data, how does an **increase in temperature** affect the rate of photosynthesis?

11. Return to your settings from 9c (**25°C, light intensity of 20, increased CO₂**).

- a. What were the bubbles per minute at this setting? _____ **bpm**
- b. Now decrease the temperature to 10°C. What were your bubbles per minute? _____ **bpm**
- c. Based on your data, how does a **decrease in temperature** affect the rate of photosynthesis?

12. Alter the variables in order to determine which combination leads to the **highest rate of photosynthesis**. Which combination of settings produced the highest number of bubbles per minute?

- a. Temperature: _____
- b. Light: _____
- c. CO₂: _____

Photosynthesis Tutorial: http://www.phschool.com/science/biology_place/biocoach/photosynth/overview.html

Use this site to answer questions about photosynthesis.

13. In the blank portion of this paper, **draw the picture** which shows the overall process of photosynthesis.



14. Write the **chemical equation** for photosynthesis.

15. Photosynthesis converts _____ energy into the _____ energy of sugars and other organic compounds.

Photosynthesis Illustration

