

# Elodea Lab

## Photosynthesis/Respiration



Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

Group Members: \_\_\_\_\_

### ∞ Background Concepts ∞

$C_6H_{12}O_6$  is glucose which is a sugar. Plants are **AUTOTROPHIC** meaning they can make their own food (glucose) from light energy.  $CO_2$  is Carbon Dioxide, the same chemical we breath out after using up oxygen  $O_2$  which is produced by autotrophic organisms like plants.

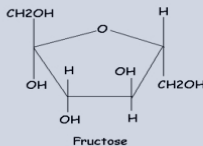
Plants can carry out both photosynthesis and respiration simultaneously. However light and the amount of  $CO_2$  available can alter these processes. During **photosynthesis**, plants are using the energy of the sun to build molecules which effectively store this energy (glucose). Chemically, the photosynthetic reaction looks like this:  $6CO_2 + 6H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6O_2$

During **respiration**, plants are using this stored energy (glucose), to fuel their metabolic processes. Chemically, the respiratory process looks like this:  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy}$

Remember that plants can carry out respiration all the time! Among other things, the converted energy from respiration is used to synthesize molecules, move materials around within the organism, grow (create new cells) and reproduce. Notice that in photosynthesis,  $CO_2$  (carbon dioxide) is being used up as it is "fixed" into glucose molecules. During respiration the opposite is true. As the plant releases the energy stored in glucose by breaking it down,  $CO_2$  is being given off into the surrounding water or atmosphere. The relationship between these two processes is special in that it allows plants to recycle some of their by-products. (While  $CO_2$  is being given off during respiration, it can be re-utilized during photosynthesis.)

In this lab, you will try to demonstrate the net change in carbon dioxide when the common fresh water plant *Elodea* is placed in a test tube just as the order of words in a sentence shapes the meaning of the sentence.

8. What determines how organic molecules will look and behave?
9. What are the four common characteristics of all organic molecules?



#### **CARBOHYDRATES**

Carbohydrates are the most common organic molecule because they make up most plant matter. They are made from carbon, hydrogen and oxygen. Their building block a single sugar called a monosaccharide. Sugars (monosaccharides) consist of carbon rings. When two monosaccharides, or sugars, combine, they form a disaccharide (di = two). When more than two monosaccharides join together, a polysaccharide (poly = many) is formed.

10. What are the elements contained in carbohydrates? \_\_\_\_\_