

All living things undergo respiration—even plants, along with making food they must “burn” some of it to stay alive. During this process, food molecules are broken down. As part of this process animals take in oxygen and release carbon dioxide by breathing, which is easily observable. Plants do not “breathe” as animals do, so respiration in plants is not as easily observable. In this investigation, you will observe the release of carbon dioxide by humans. You also will perform an experiment to determine whether plants release carbon dioxide as a product of respiration.

Carbon dioxide production by the human:

This activity will be conducted by the entire class as a large group. Obtain a plastic tumbler and a soda straw. Fill the tumbler half-full of water from the tap and return to your desk. Clear away extra materials since the water sometimes splashes during the activity. When ready, have your instructor put some bromothymol blue (BTB) indicator in the cup. The water should turn blue. BTB is a pH indicator solution that turns blue in a base, green at neutral, and yellow in an acid.

Using your hand as a splash shield, bubble (your breath) gently into the water. Watch for a color change... Describe what happened after a minute of bubbling: _____

Write the equation for respiration in the space below:

Write the equation for the formation of carbonic acid in the space below:

Ask your instructor to add drops of sodium hydroxide until the water is once again basic. Write the neutralization equation below:

Repeat the activity in an attempt to return the water to an acid condition. Follow instructions for clean-up when you're done and proceed to the next part of the lab activity.