



Mass Audubon

April Vacation Virtual Camp

Wednesday: Speak for the Trees

Grades 6 to 8

THE GIVING TREES: OXYGEN AND CARBON

What you Need

Small glass jar (baby food jar works best) or plastic bag

Large pan or bowl

Small piece of cardboard

Water

Leaf from a green plant

Staying Safe

Look carefully at the plant first to make sure there are no thorns or poison ivy.

Jump Start the Exploration

What do you know about trees?

What do you wonder about trees?

Why are trees important to humans?

Humans benefit from trees in many ways: trees provide us with food (like the maple syrup on our pancakes); they cool us off with shade and shield us from wind; they provide us with the materials for our homes; and help to hold soil and water with their roots. Trees also **release oxygen** and **hold onto carbon**. Through photosynthesis, parts of the tree (leaves and green stems) convert light energy to stored chemical energy, carbon dioxide and water is converted into sugars, and oxygen is released. It is estimated that one large tree can provide a day's supply of oxygen for up to four people.

Trees and other green plants that hold and store carbon are called **carbon sinks**. The ocean and soil also sequester (hold) carbon as a carbon sink. Carbon sinks are extremely valuable to the health of the planet as carbon dioxide is a greenhouse gas. Greenhouse gases emitted into the atmosphere from human activity are the primary cause of climate change. NASA estimates that the world's forests remove one fourth of the carbon dioxide from the atmosphere put there by humans.

DIRECTIONS

1. Pick just one green leaf from a tree or other plant.
2. Place the leaf in the bottom of the small glass jar and fill with water to the top.
3. Fill a pan or bowl with a few inches of water. The water in the pan should not be higher than the small jar when it is placed in the pan.
4. Place the cardboard over the top of the jar.
5. Flip the jar over, holding the water in place with the piece of cardboard, place it in the pan upside down.
6. Remove the cardboard. The leaf should still be in the jar and there should be no air in it. If air does get in during the process, tip the jar a little to release the air bubble, if that does not work, estimate how much air is in there.
7. Place the pan and jar in the sunlight and leave until the next day.
8. The leaf will have photosynthesized in the sun and released oxygen in the process. A bubble of oxygen will appear in the jar displacing the water.
9. Optional: Place the experiment with new leaf cuttings in different spots (shade, full sun, indoors). You can also experiment with different types of leaves or with green stems.
10. Optional: Try a leaf from an aquatic plant to see if different plants produce more or less oxygen.

Talk About Your Learning

What is the evidence this experiment gives you about trees?

What are other ways you can change the experiment?

Do you think the leaf has to be green to create the bubble?

What are ways you can protect trees and plants?

Additional Resources

Smithsonian: [What is Photosynthesis: Blinded by the Light](#)

NASA: [Climate Kids](#)

Mass Audubon: [Addressing the Challenges of Climate Change](#)

[The Power of One Tree](#) by U.S. Department of Agriculture

Arbor Day Foundation [Tree Facts](#)

[Mama Miti](#) by Donna Jo Napoli