TREES SAVE THE WORLD

Teacher Overview

Students will gain an understanding of how trees have a positive impact on the environment.

Levels

3-6

Video Link

The accompanying video is ‘Trees Save the World’ and is located at

https://youtu.be/szjE8e18NAM

Objectives

1. Gain an understanding of basic photosynthesis
2. Gain an understanding of the impacts of pollution
3. The benefits of trees to the environment.

Background

Plants, like animals need food. Unlike animals, trees (and all green plants) make their own food through the process called photosynthesis.

Sunlight is pure energy, but it cannot be directly eaten or stored. Photosynthesis is the process by which trees and green plants change the energy in sunlight to a form of energy to be stored for later use. The by-product of this process is oxygen. Plants release this gas through tiny openings underneath their leaves.

The carbohydrates produced by photosynthesis are stored in the plants cells so that when they need energy later, they can draw upon the stored resources. They get energy from carbohydrates through a process called cellular respiration. The cellular respiration process is essentially the photosynthesis process in reverse. Photosynthesis and cellular respiration are interlinked with each process depending on the products of the other.
All breathing organisms (including us) need oxygen to survive. While humans and most animals take in oxygen through their lungs, plants take it in through tiny openings or pores on stems and roots. Photosynthesis only occurs during daylight while plants respire day and night. If plants drop their leaves photosynthesis stops but respiration still continues. That means that they produce more oxygen than they use – which is good for us humans and animals. Oxygen makes up about 20 percent of the atmosphere.

How much oxygen does a tree produce? The more nutrients it produces, the more oxygen it releases as a by-product. Depending on the species, this can vary quite a bit. Age is also an important factor. A healthy young tree produces significantly more oxygen than a mature tree whose growth rate has slowed down considerably.

The video talks about this process at a simplistic level so it will be important that the associated theory match the level of the students.

Activities

1. Have the student watch ‘Trees Save the World’ video.
2. Ask students to brainstorm a list of ways that plants are important to people and other animals. Ensure that the students pick up the main points from the video including generating oxygen and storing carbon. Make a list of those ideas.
3. Ask students to identify ways that people help plants and then make a list of those ideas. If they don’t mention it, make sure the students understand that humans and animals produce pollution (carbon dioxide) and the plants take this gas to make their food.
   This demonstration lets students watch a plant make bubbles. Since the plant is under water the oxygen will be visible.
   a. Fill a bowl with fresh water.
   b. Mix baking soda into the water.
   c. Place an aquatic plant inside a clear drinking glass.
   d. Lower the glass sideways into the bowl of water until the glass fills with water and there are no air bubbles left in the glass. Then turn the glass upside down in the bowl without letting in the air. The glass should rest on the bottom of the bowl.
   e. Aim light from a lamp toward one side of the glass. You will see bubbles forming on the leaves in the water. Most bubbles will come from the side of the plant nearest to the light. After about an hour, you will see that a large bubble has formed on the top of the water inside the glass. The bubble contains oxygen that the plant has made.
   f. Ask student if they know what part of the plant gives off oxygen. Show students some leaves and have them look for stomata (tiny openings under the leaves) using a magnifying lens.
g. Using the background information discuss with students the basic steps of photosynthesis and respiration.

h. Have the students draw a tree and see if they can draw the photosynthesis and respiration process.

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