



How to Create a Compost Virtual Classroom Extension

Grade Levels

All Ages

Objectives

These activities are designed to start your at-home students in recognizing themselves as scientists and in thinking critically about problem-solving. The goal is to teach concepts through discovery and to encourage using scientific thought processes. Take these ideas and make them your own, so you and your students will have a greater chance of success.

Background Information

This activity can be used after viewing the Cleveland Metroparks Earth Day video on composting. <https://www.clevelandmetroparks.com/about/education/virtual-classroom/earth-day/how-to-create-compost>.

All you need for a healthy compost are a few scientific principles and some elbow grease! Pretty soon you will have your own “black gold”

There are two types of composting:

- Anaerobic Composting
 - Organic material + water = carbon dioxide + methane + hydrogen sulfide + energy
- Aerobic Composting
 - Organic materials + oxygen + water = carbon dioxide + water + energy
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We will be focusing on aerobic, which is the most common (compost piles, heaps, and tumblers). The naturally occurring aerobic microorganisms that inhabit compost piles require air and its oxygen to live. These microorganisms “eat” their way through the organic matter (the mix of yard, kitchen, and other green waste) that makes up compost. As they devour the organic matter, they change it chemically, molecule by molecule. The digestion process, as the equation shows, gives off energy (heat), water, and carbon-dioxide in the process.

The needs of the microorganisms — food, water, warmth, oxygen — are key ingredients. The “food” means sources of carbon — brown materials including dead leaves, pine needles, and sawdust — and nitrogen sources — green waste including kitchen scraps, fresh cut grass in a ratio of 25-parts brown materials to 1-part green.

Temperature is key for a healthy compost pile. The organisms responsible for composting can generate large amounts of heat, which raise the temperature of the pile and speeds up the decomposition process. A compost pile that is working well will produce temperatures of 140-160°F. At these temperatures almost all weed seeds and plant diseases are killed. As the organic material in compost heats up it breaks down and takes up less space. A compost pile can shrink up to 70% as it “cooks.”

Procedures

1. Start your compost pile on bare earth. This allows worms and other beneficial organisms to aerate the compost and be transported to your garden beds.
2. Lay twigs or straw first, a few inches deep. This aids drainage and helps aerate the pile.
3. Add compost materials in layers, alternating moist and dry. Moist ingredients are food scraps, tea bags, seaweed, etc. Dry materials are straw, leaves and yard waste.
4. Add manure, green manure (clover, buckwheat, wheatgrass, grass clippings) or any nitrogen source. This activates the compost pile and speeds the process along.
5. Keep compost moist. Water occasionally, or let rain do the job.
6. Cover with anything you have – wood, plastic sheeting, carpet scraps. Covering helps retain moisture and heat, two essentials for compost. Covering also prevents the compost from being over-watered by rain. The compost should be moist, but not soaked and sodden.
7. Turn. Every few weeks give the pile a quick turn with a pitchfork or shovel. This aerates the pile. Oxygen is required for the process to work and turning “adds” oxygen. Turning the compost pile is key to aerating the composting materials and speeding the process to completion.