



Lesson 3.2: Worms and Composting: How to Compost with Worms

Time: 1-1.5 hours

Common Core Standards

NGSS.K.LS2.1

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

Objectives:

- Discuss how compost can be made using worms.
- Create a compost bin.

Key words: Vocab Tree

Vermicomposting; Bedding; Red Wigglers; Compost; Food Waste; Food Cycle; Fertilizer

(Using Key words: Students can create a glossary, in books or on wall in classroom. Students are encouraged to practice using vocab in written or verbal sentences - perhaps writing example sentences and displaying them. Students could earn points for using the vocab in novel sentences each week)

Resources:

- Worms and Composting slideshow (this should be shown at the beginning of the lesson)
- The Worm Guide, A Vermicomposting Guide for Teachers
(<http://www.calrecycle.ca.gov/publications/Documents/Schools/56001007.pdf>)
- Bedding Material
- A Bin
- Red Wigglers
- Food Waste

Activities:

Introduction

Have students create their own worm bin in the classroom using leftover food waste and shredded paper. Discuss what should be put into the bin and what should be left out, where it would best be put outside, and how many worms could live inside.

Class Activity

Making a Bin:

- Almost anything can act as a bin, it just needs to be solid and at least one square foot.
- The bin needs to allow oxygen in so depending on your bin you might need to drill or cut holes into it.
- The bin also needs to be slightly propped up off the ground to allow for proper ventilation.
- Place your bin out of direct light on solid ground.
- Have students create the bedding together by shredding paper or cardboard. The one property the bedding material must have is the ability to absorb water. Worms need a moist environment—their bodies consist of 75 to 90 percent water. Moist bedding allows your worms to stay comfortable and maintain the moisture content inside their bodies. If you notice the contents of the bin tend to dry out, you may want to keep a squirt bottle filled with water near your bin and spray the contents as needed.
- To prepare the bedding, collect a small stack of newspaper. Unfold and shred the newspaper into one-inch strips until the bin is approximately two-thirds full. Fluff the newspaper strips to avoid thick clumps. Initially, add several cups of water. Continue to add water and “stir” until all the newspaper strips are thoroughly moist and your bedding material feels like a wrungout sponge—this is about a 3:1 ratio of water to bedding by weight. Be sure the bedding is not soupy or too dry because these extreme environments will serve as an eviction notice to your worms and they will start looking elsewhere for a new home.
- Once the worms have been added to the bin you can start adding food waste. Bury the food at least one inch deep to prevent odors and unwanted critters. Simply lift a bit of bedding, add the food, and put the bedding back into place.
- The contents of the bin will start to look less like paper and food and more like dirt over time. Once you have a rich dark dirt substance, your compost is complete.
- You can either harvest the compost one scoop at a time, separating the worms from the compost and placing them back in the bin, or you can harvest all at once, removing all of the worms and placing them in a new bin with all fresh materials.

(The Worm Guide, A Vermicomposting Guide for Teachers was used as a reference for this activity <http://www.calrecycle.ca.gov/publications/Documents/Schools/56001007.pdf>)

Recap

This bin will be able to produce compost from leftover food scraps, paper, and yard trimmings. The compost will then, in turn, fertilize new plants which students will be able to eat.

Discussion Points:

Discuss how worms are important to the completion of the food cycle.

What would happen if the worms were not present in the bin?

Could we survive without worms in the ground?

Further Activities or Homework

- Have students bring in a worm “salad” from home with all the food scraps they think the worms would love most.
- Have the students decorate the bin. They can paint it or hang pictures they have drawn of the worms inside.