Achieve 3000: Trash or Treasure?

DAY 1

In your fishbowl group discuss the following questions:

- What experience do you have with composting and other forms of recycling?
- What questions do you have about the process?
- What types of objects can be recycled?
- What can be composted?
- What's the difference between organic and inorganic material?

Read the following source information in your group:

Article: "Worms on the Menu?"

Source 1 is a news article about an environment-conscious restaurant owner who uses worms to help convert food waste into garden soil.

Chart: "2010: What's in America's Trash?"

Source 2 is a pie chart created by the EPA that shows the waste produced—by type and amount—in the U.S. in 2010. A large percentage of the waste produced in the U.S. is organic and can be eaten by composting worms.

How-To Guide: How To Put Worms To Work

Vermicomposting, or composting with worms, is a form of recycling because it puts waste to a new use instead of adding it to landfills. Source 3 is a how-to guide, introducing students to the steps in creating a worm composting bin.

In your group discuss the poll question,

Recycling is more trouble than it's worth.

Do you agree or disagree with this statement?

HOMEWORK: Go to Achieve and complete the reading only (all 3 parts).

DAY 2

Reread the achieve article “Trash or Treasure?” (all 3 parts), complete the activity, the after reading poll, the math, and the puzzle. While reading define these words:

Species

Compost

Nestle

Nutrient

Catalogued

Sustainability

Wedge

Textiles

DAY 3

Fishbowl Group Activity

Achieve 3000: Trash or Treasure?

Part I :

1. Carefully examine the pie chart entitled, “2010: What’s in America’s Trash?” To what extent do you think these statistics can be trusted? What, if any, additional facts are needed to validate (prove) this information?

2. What are the implications (results) of following the directions in “How To Put Worms To Work” without noting the information represented by the asterisk?

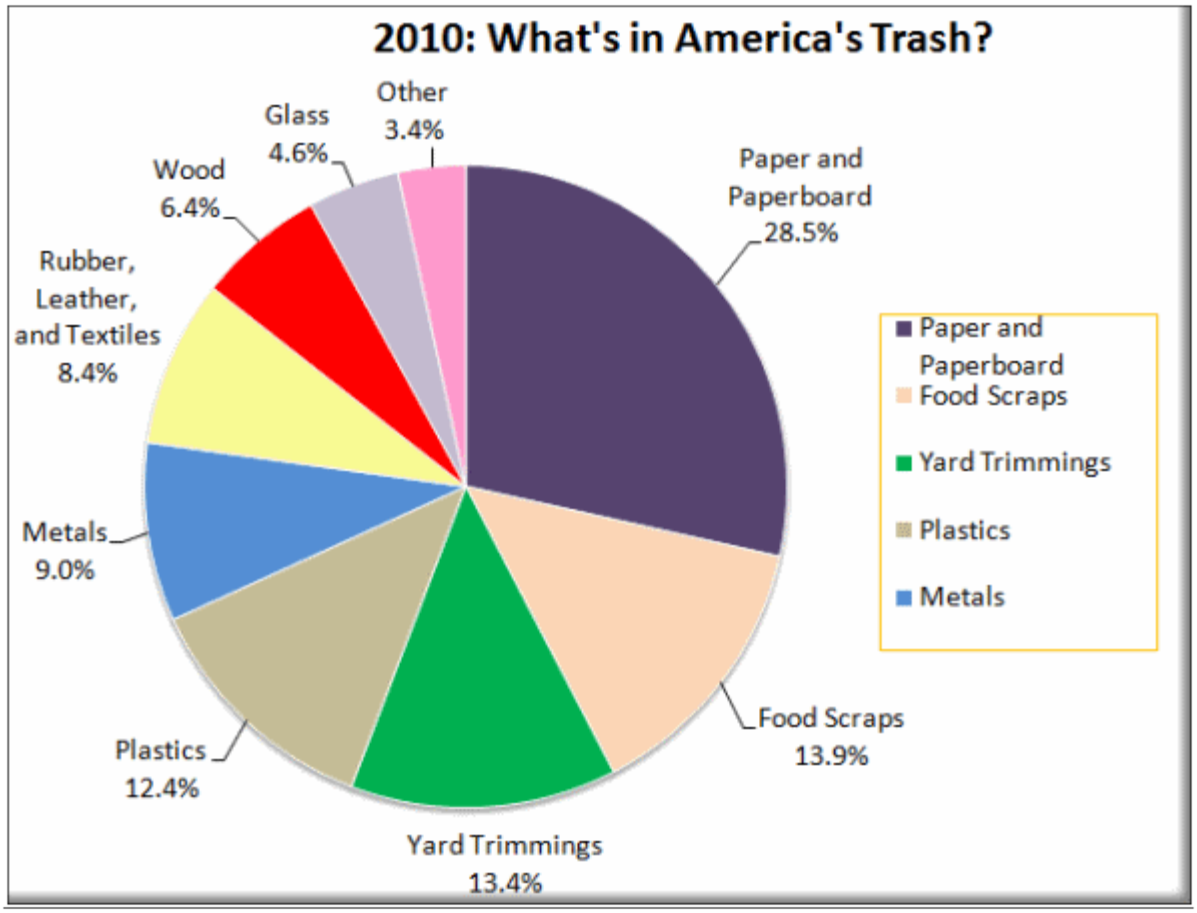
Part II:

Composting is nature's process of recycling organic materials into a rich soil known as compost. Some people feel that recycling (like the composting of food waste) is the best way to manage waste, while others believe that reducing their use of materials is more important.
Take a position in response to this question and discuss it with your group:

Is it more important for people to reuse or recycle materials than it is to reduce their use of materials? Why or why not?

2010: What's in America's Trash?

The pie chart below shows the waste produced in the U.S. in 2010. Each wedge represents the amount of different types of trash as compared to the total. A large percentage of the waste produced in the U.S. is organic and can be eaten by composting worms.



Credit: Environmental Protection Agency

Trash or Treasure?

How-To Guide

How To Put Worms To Work

The next time your family cleans up after a meal, check out your kitchen garbage. What's in there? Old coffee grounds? Bits of potato skins? Maybe the mushrooms you peeled off your pizza in disgust? All that food waste may look awful to you, but worms would just love to turn it into compost if you let them.

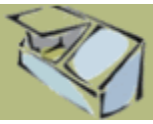
How To Put Worms To Work

Composting is the process of mixing food and yard waste and allowing it to decompose into material that can be used to provide nutrient-rich soil for gardens and flower beds. That decomposition wouldn't be possible without millions of microscopic organisms (microorganisms), such as bacteria and fungi. These microorganisms break down the food and yard scraps (organic matter) and recycle it into new soil. Composting is a form of recycling because it puts waste to a new use instead of adding it to landfills. If everyone in the U.S. composted food and yard waste, it would reduce the amount of trash put into landfills by 27 percent.

Where do the worms come in? Worms speed up the composting process and add nutrients to the compost. Composting with worms is called *vermicomposting*, or *vermiculture*. Composting can occur without worms, but some gardeners prefer vermiculture because worm excretions, called worm castings, add rich nutrients to the soil that wouldn't be there otherwise.

When they live in composting material, worms know just what to do. Here's some information so that you will, too.

Step 1: Get a Bin



The bin you choose to hold your worms, bedding, and food scraps should be between 8 and 12 inches deep and made from plastic or wood. Drill holes throughout the sides of the bin, about 3 inches apart. Drill a few holes in the bottom of the bin too, so water can get out. (Worms don't like puddles.) Have a cover for your bin, as worms like a dark environment.

Step 2: Make the Bedding

You can make bedding out of torn up newspaper, dried leaves, sawdust, or cardboard—any of these, as long as they are damp. Fill the bin about three-quarters full with bedding. Fluff the bedding to give the worms air pockets, and then mix it with a bit of soil.

Step 3: Get Your Worms

Now comes the fun part. You can't just use any type of worm for composting, because not all of them like food scraps. Many experts recommend red worms, which you can buy online or in certain stores. Just a few worms won't be able to do the job—you'll need about 2 pounds of worms for each pound of food scraps you add each day. (Worms are light, so 2 pounds of worms is about 2,000 worms!) You can start with fewer worms, but then you'll have to limit the amount of table scraps you add to the compost bin. Eventually, the worms will reproduce.

Step 4: Feed Your Worms

Worms are probably a lot less picky than most people, but they can't eat everything. They'll eat fruits and vegetables, coffee grounds, leaves, grass clippings*, and even egg shells, but they won't eat meats, grains, or dairy products. Make sure you bury the food scraps in the bedding. Yes, you'll have to touch the worms, but they won't mind, and pretty soon you won't either! Be patient. Food will take a few days to start to break down. Only then will the worms be able to chow down.

Important Note: A Warm Worm Is a Happy Worm

Worms like temperatures between 40 and 80 degrees Fahrenheit. If you live in a cold climate, you'll have to move the bin indoors during the winter. You can even keep the bin indoors all year, in a basement or a temperature-controlled garage.

Step 5: Harvesting the Compost

The worms will let you know when the compost is ready to be used. They won't text you or anything. Instead, after about three months, you'll notice that there's a lot less material in the bin, and it looks different. The compost—made up of nutrient-rich worm castings—is just about finished. Move it, and the worms, to the sides of the bin and add fresh bedding. Add new food scraps to the fresh bedding. Wait about two weeks and then scoop out the finished compost, placing it in a plastic bag. Add fresh bedding to the bin.

At this point, the worms have done their job, and it's your turn to get to work. You can mix the compost with potting soil and sand, or add it to the base of plants. The compost will yield healthier plants in an all-natural way!

*Use grass clippings in *very* small amounts. Grass clippings are made mostly of water and are very rich in nitrogen, which helps speed up the microbial process. However, moist grass tends to become too soggy and clump together, creating a bad smell. It helps to let grass clippings dry out for a few days before composting.