Compost Pile Build
A winter lesson

Activity: Make a compost pile at school, tour compost area, play compost poster game

Goals: Learn how composting reduces waste

Materials:
week 1: compost books, presentations, compost poster game, leaves and green material to build pile, tools to move leaves and add material to bins
week 2: pitchfork for garden parent, trowels for students to dig around pile; long thermometer to take temperature

How to proceed
(1) Read the background information on composting and be prepared to explain this to your students. Show them the compost recipe.

(2) Before you tour the compost area, gather your group for a brief discussion on compost. Suggested format:

(a) Why should we compost?
--composting means less waste goes to the landfill (landfills get full!)
--compost makes great fertilizer for our gardens
(b) What is needed to make compost? (show compost recipe)
(c) How do we compost at school?

(3) Next, tour the compost area: "Compost Corner"
Composters 1 and 2 are simple boxes. Composters 3-5 are "biostack" style bins made of interlocking sections that can be restacked to turn the piles. You can point out the differences in the bins. In the past we began composting at school starting with composter #1 and moved to subsequent bins once a bin filled up. We were able to hold the compost waste collected at lunches for the whole school year in our facility.

(4) Gather your materials to start your compost pile. Each class should add on to a bin until it is full. Gather brown materials (leaves) and layer it with green material (leftover fruit/veggies, fresh weeds, coffee grounds, etc.) according to the compost recipe. Add water as needed. Large items will compost faster if they are chopped up.

(5) Compost poster game
If you wish, you may use the compost poster game to help discuss what happens in a compost pile. The large poster is a picture of a compost bin with envelopes for the different elements of a compost pile. There is a set of laminated cards that you can show or pass out to the students. They have to put each card in the appropriate envelope.

(6) Return to your compost pile in a week and compare its appearance to the previous week. Take its temperature—is it getting warm and toasty? That's how you know the

microorganisms are doing their job to break down the materials. Dig around to see how the different parts look.

Background Information
Decomposition of once living, organic materials happens naturally in forest floors, under logs, in wet piles of leaves, etc. Composting happens when humans promote the natural process of decomposition and nutrient cycling by creating an environment where decomposers thrive. Very small or inconspicuous organisms such as bacteria and fungi that are naturally found in soil do most of the decomposition, although larger organisms such as insects and compost earthworms ("red wrigglers") also aid in the process. In a hard-working compost pile, heat is generated through the action of the microorganisms. Worm composters tend not to generate the same amount of heat.

There are two types of organic waste that are needed for efficient composting:
(1) Green organic wastes such as vegetable and fruit scraps, grass cuttings, and green garden debris (weeds, plant trimmings, etc) are more nitrogen-rich and will tend to heat up the pile and speed decomposition.
(2) Brown organic waste such as dried, brown leaves and other plant material, paper (shredded newspaper, paper bags, cardboard, paper towels), hay, straw, woody plant debris provide more carbon and tend to cool down the pile.
A balance of both wastes is needed to make a compost pile work. Too much "green" material and the pile will become slimy and smelly. Too much "brown" material and your compost will take a much longer time to eventually decompose.

Two other ingredients are required in the compost pile:
(3) Moisture. The organisms in a compost pile need moisture to survive. During the dry times of the year, you must add water to your pile. A good rule of thumb is to have the contents as moist as a wrung-out sponge.
(4) Oxygen. The decomposing organisms that we like require oxygen for "aerobic" decomposition. This is why we turn and fluff the compost pile. The brown materials we add also create air spaces for the organisms. In the absence of oxygen, "anaerobic" organisms take over that do not use air. Their activities will also break down material but they create nasty smells as a byproduct of their work.

Lastly, volume is helpful in a compost pile. In order to generate enough heat for optimal decomposition, a compost pile should be fairly large, typically about one cubic yard. If people don't have that much space in their yards, they will often use worm composters, which can be set up in a container in a smaller space.
No-no's in the pile: Your compost pile can become smelly if you add meat, oils or dairy products to the pile. These materials are difficult to break down and are not recommended for a typical home compost pile, although industrial-strength compost operations can handle such items. You should never add dog or cat wastes to the pile as they can carry diseases. You should also be cautious about adding horse, cow or other manures if you are using your compost for edible crops.

COMPOST RECIPE (serving size: 1 bin)

Ingredients

1 compost bin
1 part "green" waste
1 part "brown" waste
water
oxygen
microorganisms and fungi from the soil
insects and worms

Set up your compost bin on the ground. Add a layer of "green" waste. Add a fluffy layer of "brown" waste. Add a little water if needed to make your layers as wet as a squeezed-out sponge. Make sure your layers are loose so there is oxygen available to the organisms.

Repeat layers.

Wait for microorganisms, insects and worms to grow in the pile and start composting.

Turn or mix the layers if you want the compost to cook faster.

Your compost is ready when it looks like soil. Add it to your garden!