Compost Connections
3rd & 4th Grade

Students will learn about the function of compost in a garden. They will list and sort ingredients into “wet” and “dry” and describe purpose of each type. They will work together to build a compost pile and/or turn pre-existing piles. Then, they will investigate the creatures found in the compost pile.

30-45 min

Lesson Objectives:
- Students describe how a compost pile functions
- Students successfully identify “wet” and “dry” ingredients
- Students list 3 reasons to compost on a farm

What You Need

What To Do

Apple Earth Sheet
Gather students together near a compost pile. Ask students “what is the most important things for farmers to have to grow food?” Soil!! (Optional, depending on time: Do the Apple Earth demonstration provided to help students understand how precious and scarce soil is!)

4 Apples

Knife & Cutting Board

Soil Thermometer

Compost worksheet

Compost Creature Identification Sheet

Flip Chart or White Board

Tools

- Composting reduces waste by recycling things we do not eat into something useful
- Composting creates rich nutritious soil that will help farmers grow healthy crops
- You can compost all vegetable and plant waste (sometimes even dairy and meat), and even paper and cardboard
- You cannot compost plastic, tin, etc.

Next, explain to students that compost is not simply making a pile of food scraps. In order for compost to become soil, there has to be the
right combination of different types of ingredients, much like baking cookies.

Compost is made as food scraps rot and are broken down by microorganisms and other creatures. Fungi, bacteria, earthworms, and other things transform the ingredients into nutrient packed soil (yes, this means that compost is worm and microorganism POOP). In order for this to happen the compost pile has to be a good environment for these things to live in. It cannot be too wet, or too dry. It cannot be too hot, or too cold.

Farmers divide compost ingredients into two categories “wet” things and “dry” things. Wet ingredients provide nitrogen, and dry ingredients provide carbon. You can ask students to list off some ingredients that they think are wet and dry. Wet things are things like manure, green plant material, kitchen scraps etc. Dry ingredients are dry grass, leaves, straw, sawdust, newspaper etc.

The microorganisms that turn the ingredients into compost need carbon for energy, and nitrogen for protein. The best ratio is about 25:1 carbon to nitrogen. This means we want more dry ingredients than wet in order for our compost pile to work the best. A working compost pile should not stink. If there is a stinky pile, most likely it has too much nitrogen (wet ingredients), if a pile is just not breaking down it is most likely too dry, or too much carbon.

When we build compost piles, we build them in layers like a sandwich so that we can make sure we have the right combination of wet and dry. As the piles break down they actually get hot. Have students stick their hands in the pile and feel the heat. Use a compost thermometer to measure the temperature of the pile. The heat comes from the work of all the microorganisms working, crawling around and eating and pooping! We turn the piles as they breakdown to make sure that all the ingredients are accessible to the compost creatures and to mix the cooler parts of the pile on the outside, into the warmer part on the inside.

**Build a pile with the students**
Have students layer wet and dry ingredients to create a new compost pile. You can have piles of wet and dry ingredients ready, or you can go on a hunt for ingredients with kids around the farm. Divide into groups and use wheelbarrow to find and move ingredients to the compost area.
**Turn a pile with the students**

If there are already piles made, and not enough ingredients to make a new pile, turn an existing one. Give each student a pitchfork, rake, or shovel and work with them to spread out the pile, examine it, and then build it up again. Ask students if you think the pile is working well, or if we need to add wet or dry ingredients to it. If you need to add things, layer them with the existing compost as you rebuild the pile.

**Examine the compost**

Have students examine the compost (if you are turning a pile, do this before you rebuild it) pull the pile apart and let the kids get in and see what kind of insects and other life forms they find. Divide into small groups or partners. Give each group a worksheet and the compost creature descriptions. Students work together to see if they can find the things on the sheet, as well as find different organisms and draw pictures in the spaces provided.
### Apple Earth

<table>
<thead>
<tr>
<th>Apple</th>
<th>Planet Earth</th>
<th>Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Whole Apple</strong></td>
<td><strong>Earth</strong></td>
<td>1. Hold the whole apple up. “This apple represents our planet”</td>
</tr>
<tr>
<td><strong>3/4</strong></td>
<td><strong>Water</strong></td>
<td>2. Cut the apple into quarter. Hold up 3 quarters. Ask: “What do these (\frac{3}{4}) represent?” (WATER)</td>
</tr>
<tr>
<td><strong>1/4</strong></td>
<td><strong>Land</strong></td>
<td>3. Set the “water” aside and hold out the remaining quarter. Ask: “what fraction of the apple remains?” (LAND SURFACE AREA)</td>
</tr>
<tr>
<td><strong>1/8</strong></td>
<td><strong>Uninhabitable &amp; Non-Arable Land</strong></td>
<td>4. Slice the “land” in half lengthwise. Hold out one of the pieces. Ask the class: “What fraction of the apple is this?” (1/8.) Explain that this 1/8 represents the half of the Earth's surface that is inhospitable to people and to crops: the polar regions, deserts, swamps, and high or rocky mountains.”</td>
</tr>
<tr>
<td><strong>1/8</strong></td>
<td><strong>Habitable Land</strong></td>
<td>5. Set that 1/8 aside and hold out the other. “This 1/8 represents the other half of the Earth’s surface. These are the areas on which people can live, but cannot necessarily grow food.”</td>
</tr>
<tr>
<td><strong>3/32</strong></td>
<td><strong>Non-Arable Land</strong></td>
<td>6. Slice this 1/8 crosswise into four equal pieces. Hold out 3 pieces. “These represent land on which people can live, but cannot grow food. Some of it was never arable because it’s too rocky, wet, cold, steep or has soil too poor to produce food. Some of it used to be arable but isn't any longer because it’s been developed—turned into cities, suburbs, highways, etc., so it can no longer be farmed. Governments have earmarked other areas, such as parks, nature preserves and other public lands to remain undeveloped forever.”</td>
</tr>
<tr>
<td><strong>1/32</strong></td>
<td><strong>Arable Land</strong></td>
<td>7. Set aside the 3 pieces from above, and hold out 1/32. “So, only 1/32 of the Earth’s surface has the potential to grow the food needed to feed all of the people on Earth.”</td>
</tr>
<tr>
<td><strong>1/32 peel</strong></td>
<td><strong>Topsoil</strong></td>
<td>8. Carefully peel the 1/32 slice of Earth. Hold up the peel. “This tiny bit of peel represents the topsoil, the dark, nutrient-rich soil that holds moisture and feeds us by feeding our crops.”</td>
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