

Compost Curriculum

Curriculum K-2

1. Ask students if anyone knows what composting is? Record responses

Show students <https://iteroni.com/watch?v=cBkBwVFFEWw> and discuss what they learned.

2. Read Compost Stew by Mary McKenna Siddals

Provide students with dirt, newspaper clippings and grocery store circulars.

Provide paper and glue for students to create their own compost pile. (Remind students what can't go in the pile)

Curriculum 3-6

Activity 1: Discover Composting Organisms

Background: Composting, a biological process, occurs naturally nearly everywhere! Leaves drop from plants and trees. Plants and animals die. Over time, these organic materials break down or decompose. The rich, dark, soil-like material that results is called compost. Tiny living organisms do much of the work of breaking down organic materials to form compost. These tiny workers are called microorganisms and include such things as bacteria and fungi. Larger organisms, such as worms and pill bugs are examples of soil creatures that help change organic wastes into compost. When we build a compost pile, we need to create a habitat or home where the living organisms have food shelter and moisture. As microorganisms and soil creatures turn organic materials into compost, they use the organic materials as food. The organic materials provide nutrients for growth and activity. Eventually, these nutrients are returned to the soil, to be used again by plants. This is nature's way of recycling!

Materials:

Vermicomposting video available at <http://cwmi.css.cornell.edu/vermicompost.htm>

"What Lives in Compost" handout (included at end of document)

Sample of Compost

Glass slide

Hand lens or microscope

Procedure: In this activity we will explore the micro and macro organisms that do the work of

decomposition in a compost pile. The insects, worms, bacteria, and fungi found in a compost pile do the work of making compost. You can see some soil animals with the naked eye, and for some you will need a hand lens or microscope.

1. Show “Vermicompost a Living Soil Amendment” from 0:48 to 2:30 (The biology of Vermicomposting)
2. Put a small compost sample on a glass slide with a drop of water. Observe the sample under a hand lens or microscope. Draw pictures of what you see or check them off on the handout. Try to identify the organisms using the handout or information found online .

Activity 2: Watching Wastes Rot

Grade Level: Grades 4 and older

Background: Microorganisms and soil animals do most of the work of breaking down wastes in compost. Do you think wastes will break down if these organisms are not present? How long do you think it will take? Some wastes break down faster than others and some will never break down in a compost pile. Which ones will never break down and why? In this lesson, we will explore how composting works and observe how fast certain items decay.

Materials:

“How Does Composting Work?” poster in Spanish and English available at:

<http://cwmi.css.cornell.edu/workshopreadings.htm>.

Watching Wastes Rot Record (included at end of document)

16 oz. containers (remember to re-use food containers such as cottage cheese or yogurt containers)

Compost sample

Sterile potting soil, perlite or vermiculite

Organic wastes, such as orange, banana or mango peels, lettuce or other fruit or vegetable wastes

Paper wastes, such as paper napkins and paper bags

Plastic wastes, such as Styrofoam chips and plastic bags

Labels that stick on the containers or permanent marker

Procedure: Go over the poster “How Does Composting Work” and discuss the requirements that the micro and macro organisms need to be able to do their job.

1. Divide the students into groups – you can either divide them up as “compost” and “sterile potting soil” or as “organic” and “plastic”, or let each group do all combinations.
2. Distribute containers, waste material, compost, and sterile potting mix, to each group, depending on how you divided them.
3. Fill half the containers half full with compost. Fill the other half of the pots half full with sterile mix.
4. Divide your organic, paper and plastic wastes up and put half of each in containers with compost and the other half in containers with sterile mix. Make sure you put the same amount of waste into each pot.
5. Label the containers with the names of the wastes.
6. Cover the wastes with compost or sterile mix, filling the pots. Add water to all the containers so that the compost and sterile mix are damp but not wet to the touch.
7. Check your containers every few days to be sure they are still moist.
8. After one week, examine the wastes in each pot. Which wastes are decomposing?
9. Cover the wastes again, and continue to check them once a week for as long as you want.
10. Record your observations in the “Watching Wastes Rot” Record each time you check.

Answer the questions and discuss the answers

Activity 3:

This activity may work best with students working in pairs or small groups to encourage discussion and cooperation. Prepare sample lunches ahead of time to ensure variety.

Procedure

1. Inform students that no matter what they have packed for lunch, ultimately, they are eating food from dirt.
2. Challenge students to name a food in their lunch that did not come from dirt.
3. Help students figure out the ingredients in different foods and, as a class, trace each food’s origin back to the earth.

4. Ask students to list everything they are having for lunch.
5. Use a tuna fish sandwich for example:
 - Bread came from wheat grown in the dirt.
 - Pickles are preserved cucumbers grown in the dirt.
 - Lettuce was grown in the dirt.
 - Mayonnaise came from eggs, that came from chickens, that ate grains grown in the dirt.
 - Tuna living in the ocean eat smaller fish, that eat zooplankton, that eat phytoplankton, which needs nutrients from the decomposed bodies of dead plants and animals that accumulate on the ocean floor and are brought to the surface by currents.

Once students have made a list of ingredients, ask the students to draw pictures of where their lunches came from. For example, one drawing may have a field of wheat, a cow, a chicken, a farm, etc. Encourage students to show their drawings to the class and explain how their lunch came from dirt.

Watching Waste Rot: Record

Name: _____

Date: _____ Date experiment started: _____

Fill in the following table. Under "Waste", write the name of the item that you buried in the jar or pot. Under "Compost", describe the condition of the item buried in the compost. Include such things as how decomposed the item looks, what color it is, and whether or not you see fungi (spots or thin strands) on it.

Waste	Exposed to Air (Y or N)	Compost
1.		
2.		
3.		
4.		
5.		

Waste	Cut/Uncut	Compost
1.		
2.		
3.		
4.		
5.		

Did items decompose faster in the jar with air or the jar with water?

Was there a smell coming from either jar? If yes, what caused the smell?

Were items more decomposed when they were cut up or uncut? Why?

FOOD WEB OF THE COMPOST PILE

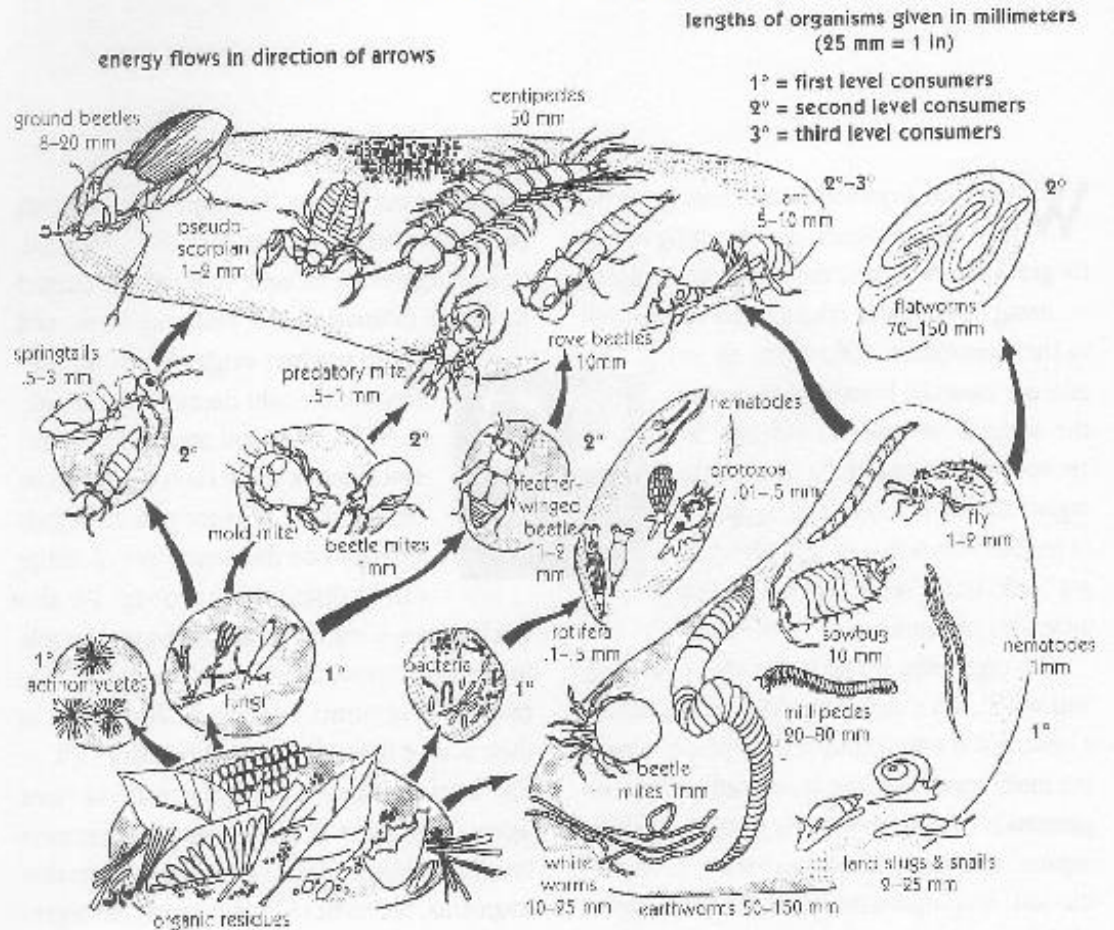


Figure 3.1 Soil organisms and their role in decomposing residues. Modified from D.L. Dindal, 1978.