

## Compost Bin Identification

**Adapted from:** Corvallis School District Second Grade Insect Unit

**Overview:** Students will observe, identify, and compare the animals and/or organisms they find in a compost or worm bin, and discuss the role decomposers (fungi, bacteria, invertebrates) play in the soil and their connection to recycling.

**Subject area:** Science

**Grade level:** 2<sup>nd</sup>

### Next Generation Science Standards:

**2-LS4** Biological Evolution: Unity and Diversity

- **2.LS4.1** Make observations of plants and animals to compare the diversity of life in different habitats.

**Objectives:** Students will be able to examine and compare the types of organisms that break down food waste into compost.

**Prep time:** 30 minutes

**Lesson time:** 30 minutes

**Teacher Background:** In nature, composting is occurring every moment all around us. In the simplest context, composting is the decomposition of plant matter into usable nutrients and soil. From old leaves and tree twigs to banana peels and apple cores, organic matter is broken down during the composting process and turned into soil by nature’s team of hard-working helpers, often referred to as “the natural F.B.I.,” fungi, bacteria, and invertebrates: these are decomposers.

Decomposition is a natural process that will happen by default, but decomposers accelerate the process. The role that decomposers perform in an ecosystem is extremely important. Without them, organic matter from past years would be piled up on the ground, and plants would not receive the nutrients they require. When an organism dies, it leaves behind nutrients that are locked tightly together. Decomposers break down the remaining energy and nutrients, releasing important nutrients (such as nitrogen, phosphorus, and magnesium) in a form usable to plants. Decomposition is an extremely important ecological function, because it cycles essential nutrients through the natural community.

Composting is not only a natural process and a good idea, but it is also fun! Compost piles are full of creeping, sneaking little creatures that are busy working away. By digging in and observing compost piles, children discover the activity beneath. With a simple magnifying glass, students can take a close look at all of the amazing organisms that are an important part of our ecosystems, yet are often overlooked.

**Materials needed:**

- White board or chart paper and markers
- Compost or Worm Bin
- Compost Critter Identification Worksheet (one for each student; included below)
- Compost Critter Information Sheet (one for each group; included below)
- Pencils for each student
- Trays to put compost on (4-5)
- Magnifying lenses
- Stir-sticks (one for each student)

**Space needed:** School Garden or Classroom

**Staff needed:** 1

**Preparation steps:**

1. Make copies of the worksheets needed.
2. Print and tape a picture of each critter on the white board or chart paper.
3. Put a few handfuls of compost from either the established worm bin or the compost bin onto each tray for students to observe.

**Discussion:** Today we're going to look for garden creatures in one specific, unique habitat, the compost bin. Ask, *what is compost? How do you think it is formed? Is there any material that you can recognize in the compost that looks familiar? What is compost used for in nature?* Explain that compost is decaying plant materials that are on their way to becoming nutrient-rich soil, which help plants to grow. Explain to students what the terms *decaying* and *nutrient-rich soil* mean.

**Presentation steps:**

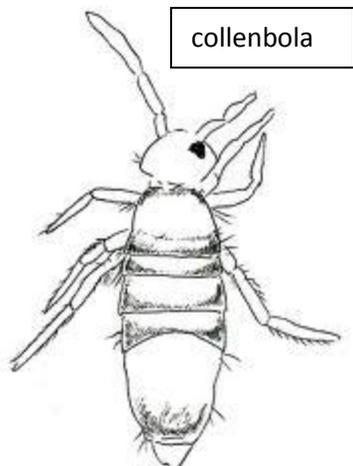
1. Divide students into small groups (four per group is ideal) and hand out a Compost Critter Identification worksheet to each student and a Compost Critter Description page to each group.
  - a. Review and explain both worksheets. Encourage students to ask questions.
  - b. Before exploring the compost, discuss behavioral expectations with the students:
    - i. Treat critters with respect—they are living things.
    - ii. If a critter gets out of the bin/tray, demonstrate how to get it back in.
    - iii. Students will need to investigate carefully (like the FBI!) –these animals are small and hidden.
  - c. Ask students to examine the compost on their trays and look for critters using the stir-sticks.
  - d. After finding a critter, one student in the group will read aloud about the critter from the description page. Group members will then find that animal on the identification sheet and circle it. If they continue to find several critters of the same type, they should put a tally next to the identified critter on their worksheet.

**Conclusion:** Have one student from each group transfer tallies to a large class sheet or white board. This can best be done by having a picture of each critter taped to a large sheet for students to put tallies next to.

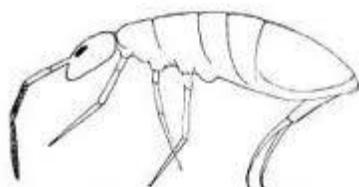
Ask the class to answer the following questions: Which compost critters did they find the most of? Which critters were the most difficult to find? Why might this be? How were the critters similar? How did different critters defend themselves?

# Compost Critters Identification Worksheet

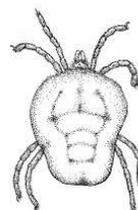
Circle Me if You Can Find Me



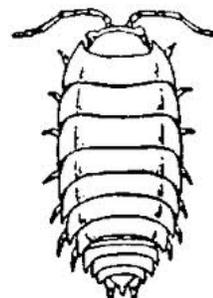
collembola



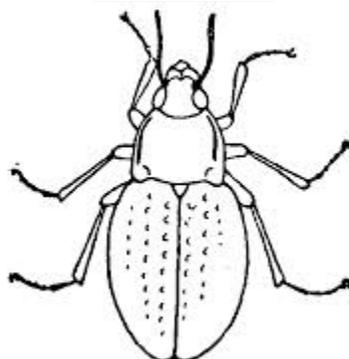
Springtail



mite



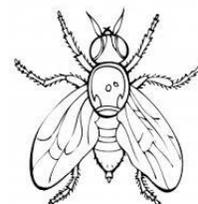
Sow bug



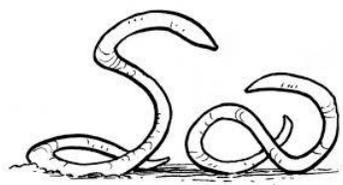
beetle



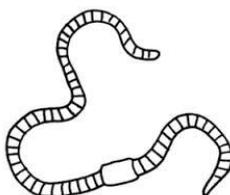
slug



Fruit fly



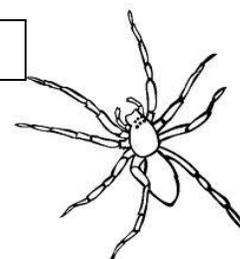
White worms



redworm



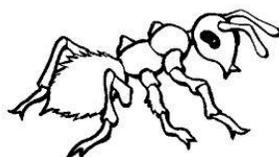
Pill bug



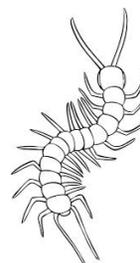
spider



snail



ant

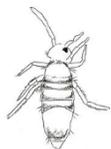


centipede



millipede

# Compost Critters Information Sheet



Collembola: I am a close relative of the springtail, but I can't jump. I am tiny, and less than 1/16 of an inch long. I eat molds and decaying matter. I am white in color.



Sow bug: I have 10 pairs of legs. That makes me an isopod like my cousin the Roly Poly. I eat vegetation and old leaves. My ½-inch-long body is oval and flat with flattened plates, but I can't roll up into a ball like a Roly Poly. I am related to crayfish and lobsters. I breathe with gills so I must live in a damp, moist place. I am a dark grayish color.



Beetle: I am an insect with shiny, black, tough wings and am ½ inch long. I am a predator and eat slugs, snails, and soft insects such as caterpillars. I live beneath stones, boards, and other moist places.



Snail: Like my friend the slug, I am a mollusk and creep around on my muscular belly. I carry on my back a spirally curved shell. I also have a broad retractable foot and a distinctive head. Like slugs, I prefer to eat living material, but I will also show up in your compost pile or worm bin from time to time for lunch.



Centipede: I move quickly on my many legs. I have 15-137 segments with a pair of legs on each. I am a fierce hunter. I love to eat earthworms. I use my pair of poison claws to help keep my prey from getting away. I am about 1-2 inches long. I am usually reddish brown.



Springtail: I am a tiny insect less than 1/16 inch long. I eat molds and decaying materials. I have a little spring that helps me jump high into the air. I am white in color.



Slug: I have muscular discs on my underside that are adapted for creeping and crawling. I lay egg masses that look like Jell-O. I eat living material, but will make an appearance from time to time in your compost pile to eat fresh garbage and garden trimmings.



Fruit Fly: I am a very small fly. People don't like me, but I don't bite, sting, or make buzzing sounds. I don't harm earthworms either. Sometimes you will see me around a worm bin if a person forgot to bury their food. I like to lay my eggs where it's moist and warm.



**Mite:** I am tiny. It would take 25 of us to cover an inch-long line. My body is round and fat so it's hard to see my eight legs. I eat plant materials such as mold and soft tissues of leaves. Some of us eat the manure of other organisms. I am usually white or Brown.



**White worm:** I look like a frayed piece of thread. I am a skinny, white worm. I am ½ to 1 inch long. I am related to an earthworm. I like to eat rotting food after the other bugs get to it. You might think of me as one who likes to finish off the job.



**Spider:** I am related to mites and have eight nifty legs. I am one of the least appreciated animals in the garden and compost. I feed on other insects and work hard to help control pests that will hurt a garden.



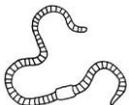
**Ant:** I am an insect with six legs. I help to decompose by breaking materials into smaller particles. I create tunnels, and move soil into clumps. Some people would rather not have me around their homes. I am black, brown, or red.



**Millipede:** I have so many legs you would have a hard time counting them. My name means "thousand legs," but I don't have that many. I am very shy and I roll up into a ball to avoid danger. I am a vegetarian and eat soft, moist, decaying plants. I am dark-red in color and am 1-3 inches long.



**Pill Bug:** I am an isopod, which means I have ten pairs of legs that look very similar to each other. I eat old leaves and veggie scraps. I am about ½ inch long and I roll up in a ball if I am disturbed. Some people think I look like a little armadillo. I am a grayish, dark color.



**Earthworm:** I am a long, thin, soft-bodied animal. My body is made up of little segments. I do not have legs or eyes. I sense light and I breathe through my skin. I eat bacteria, fungi, and other decaying materials. I like dark, moist places.