

# Delightful Decomposers

## Objectives:

- Students will be able to define what a decomposer is.
- Students will be able to describe the habitat requirements of organisms that live in soil.
- Students will be able to explain what a niche is.
- Students will be able to list the key features of insects and other soil invertebrates.

**Vocabulary:** decomposer, leaf litter, invertebrate, niche

**Grade Level:** Grades 2-6

**Time Allotted:** 20 minutes in the morning, 30 minutes to follow up in afternoon

## Standards Addressed:

### Connections to Next Generation Science Standards:

Science & Engineering Practices: Planning & Carrying out Investigations, Analyzing & Interpreting Data

Disciplinary Core Ideas: LS2.A, LS2.B, LS4.C, LS4.D, ESS2.A, ESS3.B, ETS1.B, ETS1.C

Crosscutting Concepts: Cause and Effect, Patterns, Systems and System Models

### Connections to the GSEs:

LS1 (K-2) 1b, 1c, 4a, LS2 (K-2) 5a, 6a, ESS1 (K-2) 1b, PS1 (K-2) 1b, 2c

PS1 (3-4) 2c, ESS1 (3-4) 1a, 1b, 1d, LS1 (3-4) 1a, 1b, 1c, 1d, 2a, 4a, 4b,

LS2 (3-4) 5a, 6a, 6b, 6c, LS3 (3-4) 7a, 7b,

LS1 (5-6) 1a, LS2 (5-6) 6a, 5a, 7b

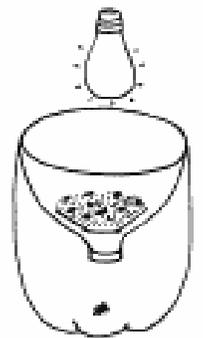
**Cross-curricular Connections:** Math, Language Arts, Art

**Materials:** metal spoons or garden spade for digging, containers to hold collected soil  
leaf litter/soil sample from the schoolyard  
funnels, glass jars, onion bag mesh or ¼ inch wire mesh,  
table lamp or clamp lamp with 60 watt bulb,  
magnifying lenses, bug boxes, Petri dishes,  
dissecting microscope or magnifying flex-cam/ ELMO cam (if available)

## Procedures:

1. Explain to students that they are going to be learning about **decomposers**. Ask students what they may already know about decomposers. They can write this in their science journals before sharing.
2. Record student feedback on the board.

3. Explain that the **niche** (or job) of decomposers is to consume dead or decaying organisms, thus breaking them down and aiding the natural process of decomposition. Decomposers are **consumers** that eat dead things.
4. After students have an understanding of decomposers, they can now start to brainstorm:
  - a. What are some examples of decomposers?
  - b. Where do they live?
  - c. How do they meet their habitat needs? (what are their survival requirements?)
5. Explain that they will be conducting an experiment to help explore what decomposers they can find in the soil. Review the four basic materials found in the earth (water, air, rocks and soil). Are these living or non-living? They will be examining the living things found in soil.
6. ***In the morning***, take students outside to the schoolyard edge to collect 2 cups of leaf litter. Each group of 3-5 students will get a spoon or trowel and a container for their leaf litter and soil.
7. When collecting their leaf litter, students should remove the driest surface leaves to find those that are moist. Leaf litter should be collected all the way down to the topsoil itself.
8. Encourage students to explore under bushes or in shady areas where leaves have accumulated. Once all the groups of students have collected their litter, head back into the classroom.
9. Back in the classroom, the students should place their litter into the burllese funnel\*. (See included instructions for how to make a burllese funnel.) They should make sure to direct the lamp over the litter. The lamp should be left over the litter for *at LEAST 3 hours* (the longer the litter is left under the lamp, the better the results).
10. Ask students if they understand how this will help collect the small invertebrates that live in the soil. (The light generates both light and heat, which will dry out the litter, driving the moisture-loving decomposers down, until they fall through the mesh and into the jar.)
11. Quickly review what an **invertebrate** is.
12. ***In the afternoon***, the groups of students will take the bottom part of the burllese funnel and carefully dump the contents into a petri dish or shallow container.



Burllese funnel

13. Students will examine the contents with magnifiers to see if they can find any small animals moving around. If the school has a dissecting microscope or flex-cam (like an ELMO cam), place the petri dish under it to examine the things that fell through the mesh of the funnel.
14. Encourage students to try to identify what kind of animals they have found. Guide them to sort or classify their decomposers and make observations. They can use field guides or the Internet to help them. They should record their observations, then draw and describe their critters in their science journals.
15. After examining all the animals, have students place them carefully back on top of the leaf litter. Turn off the lamps and remove the litter, so students can return it back to where they found it.
16. Ask students why it is important to return the organisms back to their habitats. Discuss what impact we would have if we removed the decomposers from an ecosystem. Who would recycle all the nutrients back into the soil?
17. Lead a final discussion with students about how many different arthropods and other invertebrates live in the leaf litter of our schoolyard.
18. If applicable, discuss the concept of **biodiversity** (the variety of different life forms in an area). Discuss the possible reasons for finding many or few insects in a certain location on the school ground. What new questions do their findings inspire?
19. Have students make a bar graph or a pie chart of the different kinds of animals they found. They can estimate percentages as well – how much of the soil was living and how much was non-living?

### **Extension:**

#### 1. Science Inquiry Extension

Repeat this procedure, collecting the leaf litter from the school courtyard, their backyards, different parks, or from the same location in different weather conditions and seasons.

#### 2. Arts Extension

Use a variety of art materials to re-create the soil invertebrates that were found. Make a display for the room or posters for a bulletin board of the student creations.