

5th Grade Food Waste Lesson: Composting - Nature's Recycling Team

Driving Question: How does composting mimic nature's decomposition process, and what benefits does it offer to our soil and planet?

Learning Objectives

Students will be able to:

- Define composting and explain its purpose.
- Identify the key components of a healthy compost pile (greens, browns, water, air, decomposers).
- Explain the role of decomposers (bacteria, fungi, worms) in breaking down organic matter.
- Sort common waste items into "compostable" and "non-compostable" categories.
- Understand the environmental benefits of composting (reducing landfill waste, creating nutrient-rich soil).

Vocabulary

- Composting: The process of breaking down organic materials into a nutrient-rich soil amendment.
- Decomposition: The natural process by which organic substances are broken down into simpler forms of matter.
- Organic Material: Material that comes from living organisms (e.g., plants, animals).
- Decomposers: Organisms (like bacteria, fungi, worms) that break down dead organic matter.

Modifications for Special Needs (SPED) and Multilingual (ML) Learners

- Reading Disabilities/Low Reading Levels:
 - Use item cards with clear pictures for the "Compost Recipe Challenge."
 - Provide a simplified diagram of the composting process with labels and arrows.
 - Use bolded keywords and concise sentences during instruction.
- Behavioral Disabilities:
 - Assign clear, distinct roles within groups during the "Compost Recipe Challenge" (e.g., "Greens Sorter," "Browns Sorter," "Not Compostable Checker," "Group Presenter").
 - Use a visual timer for each activity.
- Multilingual Students (ML):
 - Provide bilingual vocabulary lists with visuals for all key terms (e.g., "Decomposer/Descomponedor," "Greens/Verdes," "Browns/Marrones").
 - Show visuals for all new concepts and vocabulary.

Co-Teaching Plan

Teacher A: Launches the lesson with visuals of a garden vs. a landfill and a time-lapse decomposition video, explains decomposition and demonstrates composting.

Teacher B: Leads the small-group activity, helps students sort items, circulates to guide students in identifying decomposers and their roles, facilitates class discussion linking composting to reduced methane and improved soil health.

Relevant NJ Student Learning Standards

- **MS-PS1-2:** Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- **MS-ESS3-3:** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- **MS-ESS3-4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Learning Objectives

Students will be able to:

- Explain how decomposition breaks down organic waste into simpler matter.
- Describe how food waste in landfills produces methane and why aerobic composting prevents methane formation.
- Identify key decomposers (bacteria, fungi, worms) and their role in composting.

LAUNCH (10 minutes)

- **Visual Contrast:** Display a picture of a lush garden/plant and an overflowing landfill.
 - "What do you see in these two pictures? How are they different? Where do you think most of our trash goes?"
- **Decomposition Video:** Show a short time-lapse video of decomposition.
 - "What's happening to the food in this video? Is it disappearing? What do you think is making it break down?"
- **Food Waste Intro:** Short video introducing food waste and its environmental harm
- **Introduce Composting:** Explain that composting is like nature's own recycling system, helping things break down in a controlled way to create something useful.
- Introduce the driving question: "How does composting mimic nature's decomposition process, and what benefits does it offer to our soil and planet?"

EXPLORE (20 minutes)

- **Introduction to Compost Ingredients:**
 - Explain the concept of "**Greens**" (nitrogen-rich, moist, fast decomposition) and "**Browns**" (carbon-rich, dry, slow decomposition).
 - "Think of it like cooking: you need a good 'recipe' for a healthy compost pile!"
 - Briefly mention the need for water and air.
- **Activity (Compost Recipe Challenge):**
 - Divide students into small groups (3-4 students).
 - Give each group a set of item cards and the "Greens," "Browns," "Not Compostable" containers.
 - Task: "Your challenge is to sort these items into the correct categories and then come up with a balanced 'recipe' for a compost pile, explaining why each item belongs where it does."

- Emphasize that a good compost recipe needs a balance of "greens" and "browns."
- **Group Work & Sorting:** Students work together to sort their cards and discuss their reasoning.
- **Share Out:** Each group shares a few items they sorted and explains their choices. Discuss any disagreements or tricky items (e.g., meat scraps are generally not recommended for home compost due to pests and slow decomposition, even though they are organic).

EXPLAIN (15 minutes)

- **The Role of Decomposers:**
 - Show visuals of bacteria, fungi, and worms.
 - Bacteria & Fungi: "These microscopic organisms are the first responders. They eat the organic material and break it down into smaller and smaller pieces."
 - Worms & Insects: "Larger decomposers like worms and other insects chew through the material, helping to aerate the pile and further break things down."
 - Explain Aerobic decomposition: "These workers need oxygen to do their job efficiently. That's why turning a compost pile is important, it gives them air!"
- **The Transformation:**
 - Show a sample of finished compost/humus.
 - "When decomposers are done, they create this dark, earthy material called humus. It's full of nutrients and makes plants grow strong and healthy, like superfood for the soil"
- **Benefits of Composting:**
 - Reduces Landfill Waste: "Less food waste in landfills means less methane gas, which is bad for the environment."
 - Enriches Soil: "Compost adds valuable nutrients back to the soil, reducing the need for chemical fertilizers."
 - Saves Resources: "It's a sustainable way to manage our waste."

ELABORATE (10 minutes)

- **Class Composting:** Bring out the actual compost bin.
 - Introduce the class composting bin, talk about how it will be a place to turn food scraps into rich soil, potentially for gardening
- **Review Compost Rules:** Briefly review what goes in and what stays out, connecting back to the "Greens" and "Browns" lesson.
- **First Contributions:** Have a few students demonstrate adding appropriate "green" (i.e., a banana peel) and "brown" (i.e. some shredded paper) items to the bin. Discuss the need for a little water.
- **Ongoing Plan:** Explain how the class will maintain the compost bin (a designated "Compost Monitor" for the week, adding water if dry, stirring).
- **Beyond the Bin:** Discuss how composting is not limited to school — many people compost at home, too, or participate in community composting programs. How might starting a compost bin make a difference in our school and local community?

Exit Ticket

- Name two items that are good to compost ('greens' or 'browns') and explain one benefit of composting for our planet.