

**CLASSROOM ACTIVITY**

Recycling Food & Waste

OBJECTIVES

Students will be able to:

- **Identify** the main steps involved in composting
- **Evaluate** the benefits of composting and consider how composting contributes to sustainability
- **Create** an email or flier design that educates a target audience about composting
- **Combine** ideas from various perspectives in order to optimize their message design

OVERARCHING QUESTION

How can composting contribute to global sustainability?

ACTIVITY SUMMARY

Students will explore the idea of composting from a national and global perspective. After researching what composting entails and the impact it can have, students will educate a target audience about this process in an effort to decrease waste and/or lessen global hunger.

MATERIALS

- Devices with internet access, at least enough for one-quarter of the class
- Chart paper, five pieces
- Designing Solutions Handout, one per student
- Copy paper, enough for half the class

CHALLENGE

1. Prepare for the class period by writing the facts below on separate pieces of chart paper around the classroom. Then begin class by instructing student to quietly rotate around the room, read the statistics, and record their initial thoughts on a piece of scrap paper.

FACTS

- Around the world, about 1 in 9 people (821 million people) suffer from hunger.¹
- By 2050, an additional 2 billion people are expected to be undernourished.¹
- 500 million small farms worldwide provide the majority of food consumed in a large part of the developing world.¹
- Roughly one third of the world's food produced for human consumption gets lost or wasted every year.²

Sources

1. "Goal 2: Zero Hunger." Sustainable Development Goals. United Nations. un.org/sustainabledevelopment/hunger/.
2. "SAVE FOOD: Global Initiative on Food Loss and Waste Reduction." Food and Agriculture Organization of the United Nations fao.org/save-food/resources/keyfindings/en/.

- Food loss and waste leads to greenhouse gas emissions, which contributes to climate change.
2. Once about five minutes have passed, encourage students to share their initial reactions. Ask students: Upon reading these facts and taking a minute to reflect, do you notice any contradictions or puzzling information? Do any solutions come to mind?
 3. After several students have shared their ideas, tell students that today they will be challenged to investigate one way to reduce the impact of wasted food and help undernourishment: composting!
 4. Introduce composting by briefly explaining that waste fits into one of two categories:
 - **Inorganic waste** is made of products that cannot be broken down by decomposers. Inorganic materials have a linear life cycle because the life of the inorganic products end when they are thrown away
 - **Organic waste** is waste that can decompose. Organic materials have a full-loop life cycle because once they decompose, their nutrients are absorbed back into the soil. Composting is therefore a natural process that helps organic waste recycle into rich soil
 5. Then divide the class in half. Explain that for the rest of the class period, half of the class will investigate composting from the perspective of a national organization that focuses on minimizing food waste. The other half of the class will investigate composting from the perspective of an international organization that focuses on reducing global hunger. Assign a focus area to each half of the class.
 6. Distribute one Designing Solutions Handout to each student, and then elaborate on the challenge by reading aloud the bullets listed under *Step 1: Define the Challenge*. Explain that students will complete this challenge with a partner.
 7. After answering questions, prepare student pairs to perform research to better understand the challenge:
 - Write the following websites on the board and explain that each site will include general information about composting, as well as information more specific to each focus area. Student should begin with these websites and may then perform additional research if time allows:
 - epa.gov/recycle/composting-home
 - epa.gov/sustainable-management-food/types-composting-and-understanding-process
 - Explain that student pairs will have about 15 minutes to perform research. At the end of the research period, pairs should have a better idea of composting and how it could help their focus area

DESIGN

1. Bring the class back together and explain that it's time to develop a solution to their challenge. Call on a student to read the handout's *Step 2: Create a Design* section aloud.
2. Explain that a *target audience* is a group of people that a message is designed for. The group focusing on minimizing food waste from a national perspective, for example, could choose to target people who live in American cities. Or, the group focusing on reducing global hunger from an international perspective could choose to target small farmers in developing countries.

Note: These are two ideas, but students may also brainstorm their own target audiences! The goal is to target an audience who could compost but may not be currently doing it.

3. Tell the class that they will have about 15 minutes to complete the Design section and develop a flier or email that could be distributed to their target audience. Quickly recap and encourage students to:
 - Brainstorm a target audience in their focus area that would benefit from learning more about composting.
 - Determine the composting facts that this audience should know, as well as how composting would positively affect this audience.
 - Use a separate piece of paper to draft a flier or email that includes this information and educates their target audience.

SOLVE

1. When there are about 10 minutes left in the class period, match each student pair with a pair from the other focus area.
2. Explain that each group will share their design with each other. Every pair must:
 - Share their email or flier and explain why they chose to present their information this way.
 - Listen carefully as the other pair presents and offer at least one suggestion for how their peers could incorporate information from their own focus area to make their argument more convincing. For instance: What information about global hunger could help convince a city dweller to compost? Or, what information about reducing food waste could help convince a small rural farmer to compost?
 - Remember that the ultimate goal is to educate people around the world about the benefits of composting and convince them to give it a try!
3. Go on to explain that once both designs have been shared, pairs should complete the *Step 3: Analyze Solutions* portion of the handout and consider how to improve the design of their message by including the other pair's perspective. If time permits, they may rewrite/redraw their design in order to illustrate this change.

STANDARDS

Next Generation Science Standards

- Engineering Design
 - MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-LS2 Ecosystems: Interactions, Energy, and Dynamics
 - Interdisciplinary Core Idea - LS2.B: Cycle of Matter and Energy Transfer in Ecosystems: Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

ITEEA Technological Literacy Standards

- Standard 5: Students will develop an understanding of the effects of technology on the environment. In order to discern the effects of technology on the environment, students should learn that:
 - D. The management of waste produced by technological systems is an important societal issue.
- Standard 8: The Attributes of Design Inquiry. In order to realize the attributes of design, students should learn that:
 - G. Requirements for design are made up of criteria and constraints.
- Standard 17: Students will develop an understanding of and be able to select and use information and communication technologies. In order to select, use, and understand information and communication technologies, students should learn that:
 - J. The design of a message is influenced by such factors as the intended audience, medium, purpose, and nature of the message.

STEP 1: DEFINE THE CHALLENGE

Your challenge is to:

1. Outline the main steps of composting.
2. Explain how composting could help your focus area.
3. Create an informational flier or email newsletter that educates a target audience about composting—including how to do it and why it will be beneficial—and convinces them to compost!

List research notes below that could help you tackle the challenge:

STEP 2: CREATE A DESIGN

Work with your partner to select a target audience for your informational flier or email. This target audience must connect to your focus area.

Then review your notes and use the space below to record the key facts that your flier/email will need to include in order to educate this audience about composting, explain its benefits, and convince them to compost! Use a separate piece of paper to create a draft of your flier or email.

STEP 3: ANALYZE SOLUTIONS

Consider how you could improve your flier/email by including information from another perspective. Then work as a group to describe at least one improvement below: