

Compost Your Way

Overview: Composting food waste not only helps support the nutrient cycle by producing a valuable amendment for garden soil, it is also important for efforts to decrease materials going to landfills. In this lesson, students will explore different ways to compost food scraps by researching and/or experimenting with different types of compost systems.



Grade Level/Range: 6 to 12th Grade

Objective: In this lesson, students will:

- Investigate current challenges related to food waste.
- Learn about composting and the benefits it offers.
- Compare and contrast different kinds of compost systems

Time: 1+ hours

Materials:

- Internet access
- Compost System Comparison Worksheet <need to create>
- Various compost systems, such as a wire compost bin, compost tumbler, traditional worm bin and a Subpod® Worm Bin (optional)

Background Information

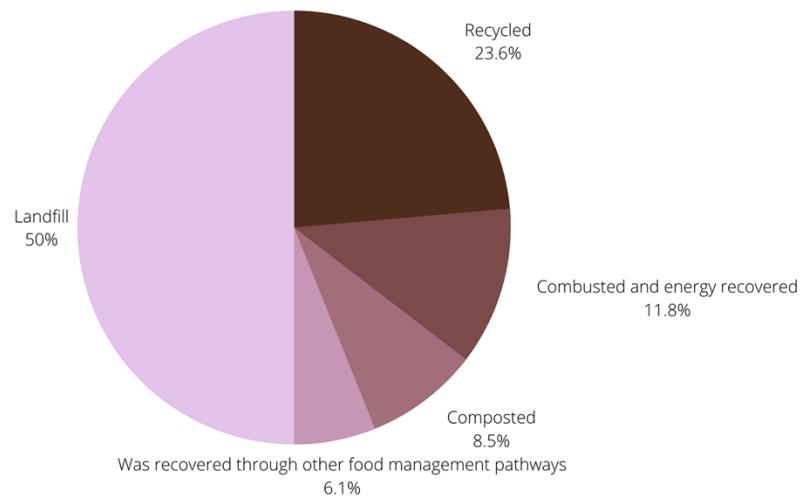
The latest report from the EPA, *Advancing Sustainable Materials Management*

https://www.epa.gov/sites/default/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf

(published in December 2020), calculates that an average of 4.91 pounds of municipal solid waste is generated by each person every day in the United States. That equates to 292 million tons a year. Of that waste, the study reports that

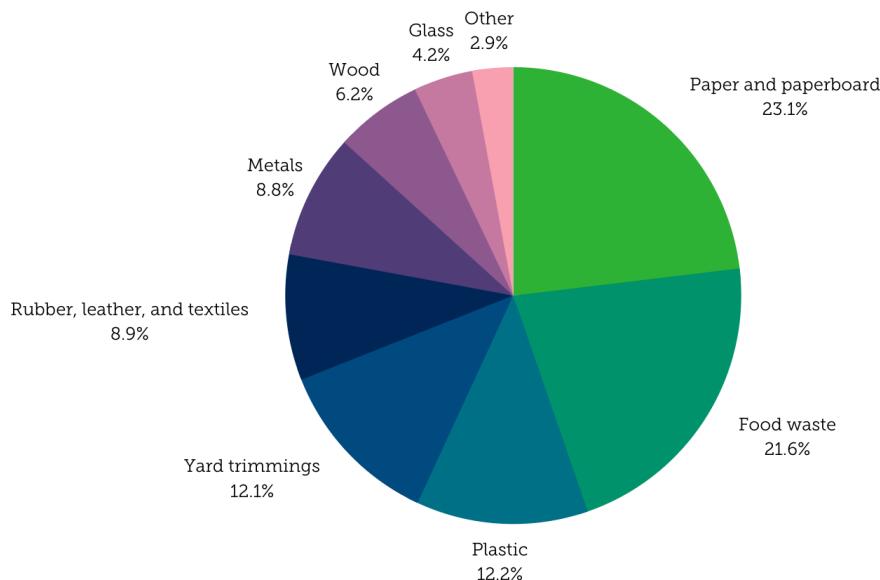
- 23.6% was recycled
- 11.8% was combusted and the energy recovered
- 8.5% was composted
- 6.1% was recovered through other food management pathways

That still left 50% placed in a landfill. That is a lot of trash!



What is our trash made up of? According to the EPA report, solid waste in the United States is comprised of:

- 23.1% Paper and paperboard
- 21.6% Food waste
- 12.2% Plastic
- 12.1% Yard trimmings
- 8.9% Rubber, leather, and textiles
- 8.8% Metals
- 6.2% Wood
- 4.2% Glass
- 2.9% Other



Finding ways to decrease the amount of waste we generate is a top priority. Simple changes such as using reusable water bottles more often, buying gently used homewares, and decreasing paper used for communication are simple ways we can change our daily behaviors. Finding new ways to recycle and repurpose what we currently classify as waste is also critical.

Almost 40% of the waste we generate in the United States is composed of organic matter (food and green organic matter along with wood). This means that composting systems — both small-scale and large-scale — have the potential to divert much of this waste from ending up in landfills.

In addition to decreasing the quantity of materials entering landfills, composting can also significantly reduce harmful chemicals that landfills release into the air. That's because organic matter breaks down differently in landfills compared to the way it decomposes in nature or in an efficient compost system. Lacking the necessary airflow, moisture, and organisms for efficient composting, the organic matter in landfills releases methane gas as it breaks down. Methane is a flammable greenhouse gas that contributes to climate change. The environmental conditions in landfills also results in organic materials decomposing very slowly, so they occupy space for a longer period of time. During a landfill excavation called The Garbage Project, researchers at the University of Arizona uncovered 25-year-old lettuce completely intact!

The benefits of compost go far beyond preventing food waste. Many gardeners call compost "garden gold" because it is full of plant nutrients and is an extremely valuable organic fertilizer. Additionally, when added to soil, it can also help improve soil composition and help with both drainage and water retention. Finding a way to generate this amazing soil amendment can also ultimately save gardeners money.

The process of composting is human's way of mimicking the decomposition process that occurs in nature, and there are many ways it can be done in a controlled setting. Check out our article on Composting Basics (<https://kidsgardening.org/gardening-basics-composting/>) for more details.

In this lesson, students will explore different kinds of composting systems and investigate how they work, their benefits and challenges,

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and also complete a cost comparison. The goal is to analyze if and how composting could be incorporated into your school or their home environment.

Laying the Groundwork:

What is food waste? What does that even mean? Encourage students to research and discuss this issue on their own or in teams and then report back to the larger group on their findings. Some resources you may want to share with them to help them with their efforts include:

EPA's Food Waste Research Site: <https://www.epa.gov/land-research/food-waste-research>
or their Sustainable Management of Food Site: <https://www.epa.gov/sustainable-management-food>.

The Center for Ecoliteracy's Understanding Food and Climate Change Interactive Guide:
<https://foodandclimate.ecoliteracy.org/interactive-guide/cover.xhtml>

Exploration:

1. From free-standing piles to worm bins, there are numerous types of systems that have been devised to help gardeners compost organic material. To make sure composting efforts are successful and sustainable, the key is to choose the right system to meet your needs and setting. Ask students to research and explore a compost system either as an individual or team project. Ask them to report back on the following information and also share a picture of an example of their system (or sketch if a picture is not available):
 - Name of composter
 - Materials made from
 - Size
 - Summary of how it works
 - How much organic material does it hold
 - Ability to compost food waste
 - Rate of decomposition
 - Ease of use
 - Cost



You can use our Compost System Comparison Worksheet as a guide. It is preferable for each student or group to look into a different type of system if possible. At minimum it would be great to have someone report back on a traditional free-standing bin, some kind of compost tumbler, and a worm bin or Subpod composting system.

If they need help choosing a system and beginning their search, Gardener's Supply Company offers a wide variety of compost systems for viewing at:

<https://www.gardeners.com/buy/composting/composters/>.

2. Return as a class to compile your findings. Use the information to discuss the benefits and challenges of each of the different systems you researched. Discuss what kind of compost systems would work best in various settings.
3. Find a way to share your findings with other students, school staff, and families. Allow students to be creative in their delivery method; possibilities include a brochure, a Powerpoint presentation, blog posts, a bulletin board display at school or in the community, spots on the school's announcements, short videos, etc.

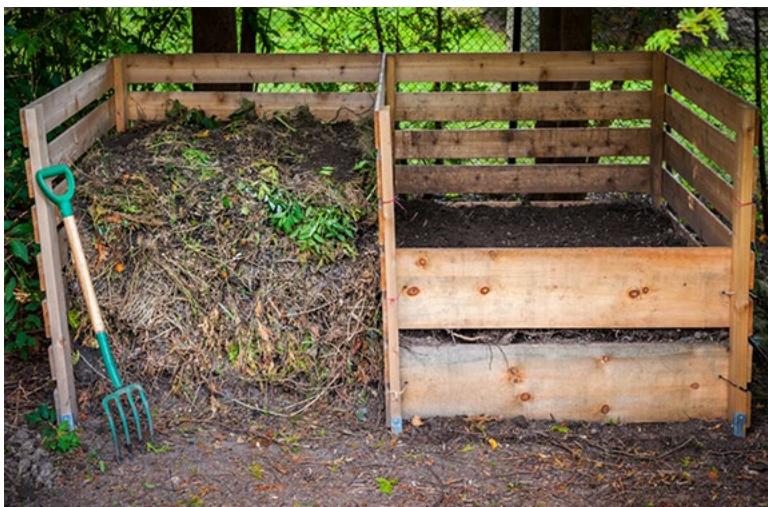
Making Connections

Ask students to use the results of their investigation to create a Food Waste Plan for your school or for their home. Ask them to incorporate practical steps that they can take to decrease food waste in their daily life.

Branching Out

If resources allow, an ideal follow up to this research project, is to have the opportunity to set up an experiment using two or more kinds of composting systems and compare your results to your researched cost/benefit analysis. Worm bins (<https://kidsgardening.org/gardening-basics-worm-composting/>) or Subpod compost systems (<https://subpod.com/pages/kids-gardening-compost-guide-for-educators>) are a great option if you only have small amount of space available to you.

For more ideas on exploring composting and the handling of food waste, check out the new *Subpod for Schools Compost Guide for Educators*. Subpod and KidsGardening teamed up to put this lesson guide together to teach students about food waste, the benefits of composting, and how to grow food — all while teaching them how these help our planet. You can receive a copy of the guide when you sign up for Subpod's educator email list: <https://subpod.com/pages/kids-gardening-compost-guide-for-educators>.



Compost System Comparison Worksheet

Name of compost system:	
Materials used to make the system:	
Size/space needed for system:	
Location of system:	<input type="checkbox"/> Indoor <input type="checkbox"/> Outdoor
Types of materials that can be composted in system:	Food scraps: <input type="checkbox"/> Yes <input type="checkbox"/> No Other:
How much organic material can the system hold?	
Summary of how the system works:	
Rate of decomposition:	<input type="checkbox"/> Slow <input type="checkbox"/> Average <input type="checkbox"/> Fast
Ease of use:	



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