

Lesson 13

Our Wasted Food

[Lesson Duration: 50 minutes]

Social Studies

Science



Lesson Overview

In the United States, as much as 40 percent of harvested food is never eaten.^{1,2} Students will learn why food waste is a problem and explore strategies to reduce it. Extension projects will further empower students to take action to reduce food waste in their homes, schools, and communities.



Learning Objectives

- Explain why food waste is a problem.
- Describe what happens to food waste.
- Identify strategies to reduce food waste.



Essential Questions

- Why is wasting food a problem for public health and the environment?
- How can we reduce food waste?



Materials

- Presentation slides
- FoodSpan Infographic



Resources

- *Wasted Food* primer (www.foodsystemprimer.org/wasted-food/)

Warm-up: The Problem of Food Waste

Social Studies

[15 minutes]

Ask students to reflect on the last three days and recall any time they threw out food. *What was the food? How much was thrown out? Why did they throw it out?* After students respond, share this statistic: An estimated 31 to 40 percent of all food harvested in the United States is never eaten.^{1,2}

Ask: Does this statistic surprise you? Where along the food supply chain do you think this food waste occurs? Generate a list on the board that includes these steps in the supply chain:

- **Before Harvest:** Before food is harvested, crops may be lost to **pests** or bad weather, farmers might overestimate demand for a crop and plant more than they can sell, or there may be a shortage of farm workers to help with harvesting.³
- **After Harvest:** A large portion of produce is discarded because it does not meet consumers' expectations for size, shape, color, sweetness, or a flawless appearance.³ Not all is wasted, as some is composted or fed to animals.
- **Processing:** When food is processed and packaged for sale, edible parts such as skin, peels, and fat may be trimmed and discarded. Again, not all is wasted, as some is used for purposes such as animal feed or soup stock.³

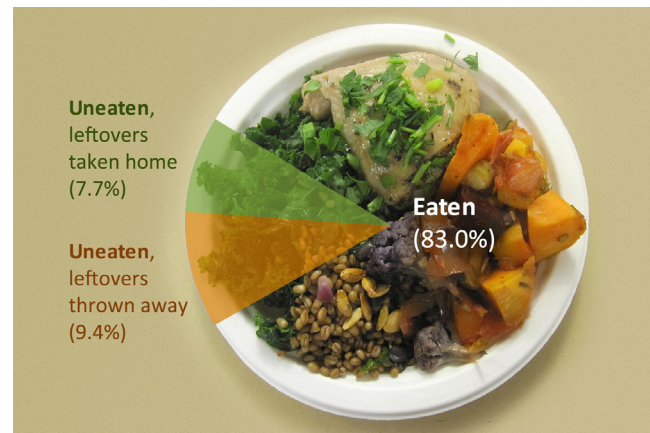


Supermarkets may keep shelves bursting to please customers, even if it means stocking more food than they can sell before it spoils.

Photo credit : Bunny Hero, 2010. Flickr. Creative Commons CC BY-SA 2.0.

- **Grocery Stores:** Stores try to keep shelves bursting with food at all times to please their customers, even if it means stocking more food than they can sell before it spoils.³
- **Restaurants:** Restaurants tend to serve large portions, which consumers may not be able to finish in one sitting. On average, diners leave an estimated 17 percent of their meals uneaten.³
- **Retail and Consumption:** Stores and consumers regularly throw away food that has passed its “sell by,” “best by,” or “use by” date, including food that is perfectly edible. Contrary to what many consumers believe, expiration labels are manufacturers' recommendations for peak quality, and generally have nothing to do with **food safety**.⁴

To summarize, display the **Waste by Food Group slide**, which shows the percentage of U.S. food waste from different sources. *Ask: What kinds of food are wasted most? Do these percentages surprise you? What does this tell you about the problem of food waste?*



Restaurants tend to serve large portions. On average, diners leave an estimated 17 percent of their meals uneaten.

Photo credit: Mia Cellucci, CLF. Adapted from original.

Main Activity: Why Food Waste Matters

Science, Social Studies

[15 minutes]

Ask students to imagine they are walking through the woods eating an apple. When they get to the core they toss it into the woods. Ask: *What will happen to the apple core?* Then, display the **Nutrient Cycle slide** and explain the cycling of **organic matter** in nature: Decomposers in the soil break down the apple core and turn it into **nutrient**-rich material that can be used by other plants. Much of our food waste gets mixed with non-biodegradable waste and sent to landfills, and thus its nutrients are not restored to the soil.

Display the **Landfills slide** or write the following on the board: Food represents the single largest component (21%) of solid waste in landfills and incinerators.⁵ Explain that the vast majority of food waste ends up in landfills or is incinerated (burned at high temperatures).⁶ When food decomposes while buried in a landfill, it does so without oxygen and therefore generates methane, a **greenhouse gas** with at least 21 times the global warming potential of carbon dioxide. Ask: *What does this tell you about how food waste impacts humans and the environment? Why is food waste a problem? What should we do with food waste*

instead?

Ask: *In addition to these environmental problems, what are other costs of wasting food?* Encourage students to think about all areas of the **FoodSpan Infographic**. Write responses on the board. Answers can include:

- **Waste of agricultural inputs:** In the U.S., an estimated 25 percent of **freshwater** use, for example, is wasted producing food that is never eaten.² When food is discarded, animals are unnecessarily raised and slaughtered, **pesticides** are sprayed for no benefit, and land and labor is spent nourishing crops that never nourish people.
- **Waste of potential profit:** Discarding food also means throwing away money. Farmers miss opportunities to profit when fields go unharvested. Grocery stores and restaurants lose money each time foods they stock go unsold. The estimated value of food discarded by U.S. consumers and food stores alone was over \$160 billion in 2010.¹



Teacher Note: Refer to Lesson 5 for more about climate change and its connection to food.

Main Activity: Reducing Food Waste

Social Studies

[15 minutes]

Have students pair up and discuss: *What are two ways we can reduce food waste?* Ask volunteers to share their partner's responses with the class. Write responses on the board.

Display the **Food Recovery Hierarchy slide**. Explain that the U.S. Environmental Protection Agency (EPA) prioritizes these interventions from top to bottom—in other words, the interventions at the top should be explored before moving to the ones at the bottom. Explain each intervention (refer to the **Wasted Food primer** for details):

- **Reducing food waste at the source:** Businesses or individuals can avoid purchasing food they will not use.
- **Feeding people:** Excess food can be donated to soup kitchens, food pantries, etc.
- **Feeding animals:** Food that might not be appropriate for humans can be fed to livestock.
- **Industrial uses:** Food waste is used in the manufacture of biofuels and bioproducts such as building materials.
- **Composting:** Through decomposition, this process converts **organic matter**—such as food waste, crop residues, or animal manure—into a dark, spongy material that enhances soil fertility.
- **Incineration or landfill:** If the above interventions are not used, this is where food waste ends up.

Ask: *Why do you think the EPA ordered the list in this way? Do you agree with the order?*

Divide students into five groups and assign each group one of the top five interventions in the food recovery hierarchy (refer to slide). Have students create a proposal for a program to reduce food waste in their assigned area. Encourage them to think about how this applies to their community (e.g., the “feed hungry people” group could create a plan for their school to donate excess cafeteria food to a local soup kitchen). As groups share back, continue to add their ideas to the list on the board.

Wrap-up: Food Waste and Me

[5 minutes]

Have students write a journal entry in response to the prompt: *What are some individual or collective actions that you and others could take to reduce food waste in your home, school, or community?* Optional: Have students share their responses.



Share Your Knowledge: Ask students to tweet to spread awareness about the problem of food waste and how to reduce it. Use hashtags like **#stopfoodwaste** and **#foodspan** to join the conversation.

Extensions:

Revisiting the Infographic (Social Studies)

Distribute copies of the **FoodSpan Infographic** (students may already have their own from previous lessons). Ask students to identify parts that represent food waste. Ask: *Do these accurately and fully represent what we learned about food waste? If not, what could we add to make the infographic more accurate?* Working individually or as a class, have students draw their own versions, create a collage, or add images to the existing infographic. Share photos of students' work on social media and tag #foodspan.

Food Waste Audit (Social Studies)

Students will conduct a food waste audit at their school or a similar setting. *LifeSmarts*, a program of the National Consumers League, provides detailed instructions on how to collect and measure food waste, followed by a series of critical thinking questions (lifesmarts.org/food-waste/). The activity is designed for student teams competing in the National LifeSmarts Championship. Anyone can do the activity, but students will not be able to compete unless they are already enrolled in the competition. Visit lifesmarts.org for information about registering.

FoodKeeper App (Social Studies)

Show students how to use the USDA "Food Keeper" app, which alerts users when their food will likely go bad (<https://itunes.apple.com/us/app/usda-foodkeeper/id978186100?mt=8>). Ask students to practice using the app for a few days and share what they have learned.

Food Waste Investigation with John Oliver (Social Studies, Science)

Students will watch John Oliver's investigation of food waste in America (www.youtube.com/watch?v=i8xwLWbOILY). Teachers should watch this clip before sharing it with their class to decide whether the content and delivery is appropriate for their students. Students may write a reflection paper on the clip or conduct a research project on a certain aspect of food waste highlighted by Oliver. Note: This clip can also serve as an introduction to the lesson.

Food Recovery Ambassadors (Social Studies, ELA)

Students will create an education campaign to motivate their peers to reduce food waste. Messaging can include tips for keeping food fresh and information about the shelf life of particular foods. This campaign can include posters, morning announcements over the school PA system, "food recovery ambassadors" talking to students in the cafeteria, and social media posts using the hashtags #stopfoodwaste and #foodspan.

Create a Compost Pile (Science)

Students will create a school, classroom, or home compost pile. Consult the U.S. Environmental Protection Agency's website for tips on getting started (www2.epa.gov/recycle/composting-home). Students can share their progress on social media using the hashtags #compost and #foodspan.

1. Buzby JC, Wells HF, Hyman J. *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*. USDA ERS; 2014.
2. Hall KD, Guo J, Dore M, Chow CC. The progressive increase of food waste in America and its environmental impact. *PLoS One*. 2009;4(11).
3. Gunders D. *Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*. NRDC; 2012.
4. Leib EB, Gunders D, Ferro J, Nielsen A, Nosek G, Qu J. *The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America*. Harvard Food Law and Policy Clinic and the Natural Resources Defense Council; 2013.
5. U.S. Environmental Protection Agency. *Reducing Food Waste for Business*. 2014.
6. U.S. Environmental Protection Agency. *Basic Information about Food Waste*. 2012.