RUTGERS–NEW BRUNSWICK
School of Environmental and Biological Sciences

Lesson Six

Food Waste in the Food System

USDA NIFA

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Robert Wood Johnson Foundation

Lesson Six

Lesson Overview

This lesson builds on the understanding of a food system and how the activities in the food system can impact the natural world, including the climate, by allowing students to explore where food waste occurs throughout the food system, and why. They engage with data (figures) about where food waste happens and how significant a problem it is. In this lesson, students are also introduced to the notion that individuals and communities are innovating to solve the problem of food waste and encouraged to think about ways they can join that effort.

Next Generation Science Standards

5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

4 ESS3-2 : Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change have on humans.

Science and Engineering Practices

- For this lesson, students are engaged in the following Science and Engineering Practicesion.

Obtaining, Evaluating, and Communicating Information

- Obtain and combine information from books and/or reliable media to explain phenomena or solutions to a design problem.

Developing and Using Models

- Develop a model to describe phenomena.

Cross Cutting Concepts

Systems and system models

- The food system is comprised of interacting sectors or components that use resources and produce waste which has environ¬mental and social impacts.

Cause and Effect

The decisions people make about growing, harvesting, processing, c onsuming, and disposing of foods effects the natural world. Food that is wasted or unused at different stages of the food system will have an effect on the atmosphere, water, and other natural resources. For instance, food waste (cause) in a landfill creates the greenhouse gas methane (effect) which contributes to global warming (effect).

Disciplinary Core Ideas

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems.

ESS2.A: Earth Materials and Systems.

ESS3.C: Human Impacts on Earth Systems

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ELA Integration

RI.5.7: ***5-ESS3-1***– Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

Mathematics Integration

MP.2: ***5-ESS3-1***– Reason abstractly and quantitatively.

MP.4: ***5-ESS3-1***– Model with mathematics.

Driving Question(s)

- What causes food waste in different areas of the food system?
- Do some parts of the food system create more food waste than others?
- What solutions are there to help?

Lesson phenomena

Figures and Infographics about food waste to investigate and gather information from.

Learning Objectives

Students will be able to:

- Identify two sectors or components of the food system where food waste occurs.
- Describe things that can help reduce food waste.

Behavior Change Objectives

As a result of the lesson, students will:

- Discuss new habits they will try to reduce the amount of greenhouse gases. created from their activities.
- Elect to curtail personal food waste using one of the solutions explored in the unit.
- Discuss a solution to climate change with friends or family.

Keywords

systems | components | greenhouse gases | carbon dioxide | atmosphere, methane | energy | global warming | climate system | fossil fuels greenhouse effect

Blue italicized words are web links for more information.

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Before you Begin

Set students up into Home Groups and Expert Groups for the Jigsaw Activity. Four groups minimum, or six smaller groups and some groups can use the same figure/handout.

Print out the Food System and Food Waste cards and cut them in advance. Make enough copies for each pair (or small group of 3-4 students) to have all food system cards, one sheet of Food Waste Cards, and one "Modeling the Food System" Handout.

Materials

- Presentation slides and Worksheets
- Computer/Chromebook/Technology
- Video https: ***youtube.com/watch?v=zhtFCNaNx1Y&list=PLKx8NLAujm_nCPmzH-M3eUKiaqMvaH55Zw&index=8***
- Card Game Materials
- Copies of KidsNews.com: UN report finds food waste a growing problem | KidsNews (Optional Lesson Extension)

Observable Phenomenon

Remind class that last time we learned about the food system, the different resources that are used to move food from where it is grown or produced to where it is eaten and then disposed. In addition to resources or inputs (think of them as ingredients) used at each stage, there is often waste or outputs at each part of the food system. Today's lesson is called "Food waste in the food system."

Students engage with handouts (i.e. figures and infographics about food waste) in small group or individually (teacher preference). The figures are the same as those in slides titled, "Lesson Two".

They are:

1. An American Family of Four's Monthly Food Waste.
2. U.S. Food Waste Disposal Data.
3. Municipal Solid Waste by Percentage in Mercer County NJ (pie chart).
4. Greenhouse gas emissions from the food supply system. The slides and handouts contain questions about each figure.

Each group fills out one of the four handouts. Then everyone returns to their "Home Group" to share what they learned, and they complete the "Facts about Food Waste" in there if time allows. You may decide to use the "Facts about Food Waste" as Lesson Extension.

If using the Jigsaw method, groups will meet to discuss each figure and answer the questions for that figure on the worksheet. Then, they'll return to their "home group" to share the information and gather the information on the other figures from their peer to complete the worksheet.

Several students are asked to share their findings with the class.

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Video Lesson

Watch the video in advance, if possible and observe points that are ideal to pause video and discuss or reflect with the class.

Play Video embedded in the slides.

Main In-Class Activity

Modeling Food Waste in the Food System

In small groups, student follow the directions for the Food System Modeling game provided. Teacher may review instructions and demo game before students play in groups. After assembling the system using the worksheet and cards, provided, students place the Food Waste cards above or next to the parts of the food system where they think food waste occurs. Students then share out and are challenged to think of ways to reduce food waste for each sector of the food system where “Food Waste” cards were placed.

Lesson Extension

Students will read the KidNews article titled Food Waste a Growing Problem and answer the questions at the end of the article in pairs or individually. The article and questions can be found in the student handouts for this lesson.

COMPOST LIFE CYCLE