



RUTGERS-NEW BRUNSWICK
School of Environmental
and Biological Sciences



Lesson Four

Getting to know the Food System





Lesson Overview

As a foundation for thinking about the relationship between food and climate change, students will develop a basic understanding of the concept of a food system. Students are introduced to the components of the food system, and the food supply chain, in addition to the various resources used as foods are grown and move through the system to consumption and disposal. Students use a diagram of the food system to practice assembling a model of a food system, identifying the resources used at different stages.

Next Generation Science Standards

5-ESS3-1 – Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.

Science and Engineering Practices

Developing and using models
Obtaining, Evaluating, and Communicating Information

Cross Cutting Concepts

Systems and system models
Energy and Matter

Disciplinary Core Ideas

ESS3.C: Human Impacts on Earth Systems
PS3.D: Energy in Chemical Processes and Everyday Life
LS1.C: Organization for Matter and Energy Flow in Organisms
LS2.A: Interdependent Relationships in Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Driving Questions

- What steps and resources/inputs are involved in getting our food to us to eat? What connects the different parts of the food system?
- How does food get from the farm to plate? How can we model this journey in a way that lets us understand it, and make changes to it?

Observable phenomena

Diagram of food system





Learning Objectives

Students will be able to:

- Understand the idea of the food system as the journey that food takes from farm to plate.
- Recall the components of the food system. Name 3 resources/inputs that the food system requires.
- Describe the different stages of food systems.

Behavior Change Objectives

As a result of the lesson, students will be able to:

- Assemble the resources of a food system in the correct order.

Keywords

Food system | stage, | resources (environmental and social) | inputs | outputs | production | food processing | distribution | consumption | waste management | components | interactions | food waste | harvesting | landfill

Sources used in the development of this lesson

- Sobal, Jeffery, et al. 1998. "A conceptual model of the food and nutrition system." *Social Science & Medicine* 47(7): 853-863. [doi.org/10.1016/S0277-9536\(98\)00104-X](https://doi.org/10.1016/S0277-9536(98)00104-X)
- Sustainable Food Center. 2020. "What makes up a food system? Breaking it down into 4 parts." sustainablefoodcenter.org/latest/blog/what-makes-up-a-food-system-breaking-it-down-into-4-parts

Before you Begin

- Review lesson, presentation, handouts, and game.
- Prepare handouts – food system and exit ticket.
- Make sure you have the card game and review the rules of how to play.

Background Information

- NGSS requires 3rd-5th grade to understand what a system is and understand that it has components and interactions. Students should understand that a system is a group of related parts that make up a whole and carry out specific functions. When students are in middle school, they will go further into details with systems, understanding that interactions within systems include, inputs, outputs, and processes. Some of these interactions can be briefly explained in 3rd and 5th grade to provide students with a better understanding of how a system works.

Materials

- Paper or in-class workbooks
- Presentation Slides and Worksheets
- Writing instrument (pen or pencil)
- Handouts
- Food Journey video [youtube.com/watch?v=SgFKfVfghpg](https://www.youtube.com/watch?v=SgFKfVfghpg)
- Computer/Device
- Card Game Materials
- Exit Ticket



1st Phenomenon: diagram of food system

1. Students are given a diagram of the Food System and given a few minutes to look it over. This diagram just has the labels but not a description of what each part does. Have students turn and talk to a peer about what they Notice and Wonder about the diagram. They can write down their Notice and Wonder thoughts in the workbook. How is it a system? What is it representing? How might this connect to the Greenhouse Effect lessons?

2nd Video How do Bananas Grow and End up in the Store

1. Video How do Bananas Grow and End up in the Store.
 - A. As a class, watch the short video of one food's journey from farm to store. *How do Bananas Grow and End up in the Store?* from YouTube.
 - B. Ask students to refer back to the diagram handout as they watch or listen to the video to identify each stage the bananas go through in the system. Watch the video a second time so students can write down the different resources/inputs used in each of the stages on the corresponding handout.
2. After the video, ask if the bananas made it all the way through the system diagram stages and if not, what was missed or what extra steps were there? What resources/inputs did they notice being used? What parts of the process do they think create greenhouse gases that contribute to global warming? What other environmental impacts do they notice? What questions are generated from the video and/or diagram? Teacher can record notes on the lesson slides of student responses and questions.

3rd Card Game

1. Using cards provided, students should try to correctly assemble a food system using the cards for each component of the food system.
2. The resource cards can be stacked on top of or placed next to the various parts of the food system that demand that resource (e.g., water for plants, fuel for tractor) used and the greenhouse gas emissions produced at different areas of the food system (e.g. fossil fuels to power processing facilities or emissions from trucks that move food across the world).
3. In small groups or as a class, students can brainstorm what parts of the food system create greenhouse gas emissions (heat trapping gases that increase the temperature of the planet).
4. Review the five main stages of the food system by showing the slides of the food system: potato example. Review the five main stages of the food system by showing the slides of the food system: potato example.

Exit Ticket

Teacher passes out Exit Ticket. Students each write down their answers to the questions on the ticket. The teacher collects exit tickets and reviews student answers. Make minor adjustments to the next lesson based on data received.

