LESSON 2: ALL SYSTEMS GO!

OVERVIEW

Students will learn about food systems and the ways in which farmers work through these systems to deliver food from farms to schools while also caring for the environment.

TIME

Two 45-minute classes

OBJECTIVES

In this lesson, students will:

- Identify the parts of a food system;
- Consider the benefits and drawbacks of local, U.S., and global food systems; and
- Trace a food as it moves through a food system.

STANDARDS

NGSS

ESS3.C: Human Impacts on Earth Systems

The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)

MS-LS4-5.Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.

CASEL FRAMEWORK

SELF-AWARENESS: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. This includes capacities to recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Such as:

- Identifying one's emotions
- Experiencing self-efficacy
- Having a growth mindset
- Developing interests and a sense of purpose

CDC NHES

1.8.1 Analyze the relationship between healthy behaviors and personal health.
1.8.3 Analyze how the environment affects personal health.

MATERIALS

In addition to common classroom materials and an Internet connection, students will need:

- Food System Process Guide

PREPARATION

1. Arrange students into groups of 3.
2. Print or provide access to student materials.

INTRODUCTION

Ask students where their food comes from. Answers will likely include the market or farms. Then, explain that the process from farm to table can be a long one. For example, depending upon where you live, an apple can be harvested months before it reaches your table! This is possible because of innovative technologies that help to preserve foods for longer periods of time. Tell students that in this lesson, they will explore food systems and how foods move from the farm to their school lunch.

LESSON PROCEDURE

Step 1

Ask students to identify a food that your state is known for. For example:

- Florida oranges
- Maryland crabs
- Oklahoma steaks
- New Jersey corn
- California almonds
- Georgia peaches
- Idaho potatoes
- Maine lobsters
- Washington salmon
- Wisconsin milk/dairy

Note: If your state doesn't have an obvious example, pick a nearby state or one from the list above.

Step 2

Ask why they think they are so popular in their state. Explain that those foods are associated with the state because they are locally farmed there. Because they are locally farmed, they are very accessible, and often affordable, so they are used in many local dishes. When people from other states come to visit, they will notice an abundance of that ingredient and will associate it with the state.

Step 3

Explain that there are a number of steps that need to happen between when a food is farmed and when it reaches your table. Explain that the production cycle of food is called a "Food System." Show students **this video** from the United Nations that gives a brief introduction to the importance of sustainable and equitable food systems around the world.

Step 4

Explain that a local food system (also known as a community food system) has several interdependent parts. One way to more easily comprehend a food system is to think of a supply chain of a food that moves from farm to table. Describe the four most basic supply chain steps to the students:

1. **Production:** This is when the food is grown (fruits, vegetables, grains, etc.) or produced (milk, meat, fish, etc.).
2. **Processing:** While some foods remain unprocessed, others are shipped to another facility where they are processed (for example, strawberries being turned into jam or milk being used to make yogurt) and packaged.
3. **Distribution:** Once the unprocessed and processed foods are harvested and/or processed and packaged, they are distributed--or sent out to local markets such as grocery stores or restaurant suppliers.
4. **Consumption:** Finally, the consumers (such as families, restaurants, or schools) purchase the food and bring it to their tables.

See the *Supply Chain Steps* Handout.

Step 5

Explain that in some local food systems and supply chains, food can bypass some of the steps. Have students watch **What is a Local Food System?** to learn more about the flexibility of local food systems.

Step 6

Explain to students that there are many different community food systems, however, they are all based on geography and food that is grown close to the consumer. According to the USDA:

"'Local and regional food systems' refers to place-specific clusters of agricultural producers of all kinds—farmers, ranchers, fishers—along with consumers and institutions engaged in producing, processing, distributing, and selling foods…" Source: **Trends in U.S. Local and Regional Food Systems: A Report to Congress.**

Spend a few minutes discussing this definition and ask them to identify parts of their own community's local food system.

Ask students to list some of the ways that a local food system benefits their community. Some answers may include:

- local food production and sales help the community economically;
- local food systems create more local jobs in the community;
- food can be fresher when sourced locally; and
- locally produced food does not need to be shipped as far (distribution) so less fuel is used.

Step 7

Now, ask students to list ways in which they can help to promote and support their local food system. Share this graphic with them if they are having a difficult time generating ideas.

See the *Community Food System* Handout.

Step 8

Now, ask students to name a food they like that is not locally sourced. Explain that while it can be beneficial to source foods locally, this is not always possible, especially when you consider the climate that certain foods are grown in. For example, people living in Alaska cannot access locally-grown pineapples. People in Hawaii cannot access locally-raised wild salmon. Because of this, we also have national and global food systems. While the basic steps are the same, the process can be a little bit more complicated. Have students watch the USDA video **Climate Change, Global Food Security, and the U.S. Food System** to learn more about the relationship between the U.S. Food system, global food security, and climate change.

Step 9

Now, have students reflect on the video to share the ways in which climate change affects U.S. and global food systems and which innovations can help to minimize or negate the effects. Remind students to consider the innovative environmentally sustainable practices from the previous lesson and describe how those practices will reduce the impact of production and can positively impact local, national, and global food systems.

Step 10

Finally, have students trace a food from farm to table through a local, U.S., or global food system. Arrange students into groups of 3. Have each group select a "complex" food (not a single ingredient) such as pizza, burrito, or vegetable lasagna.

Step 11

Have each group identify the main ingredients for the food. Then, have them identify the progress through the food system for each main ingredient using the guide below. An example of frozen lasagna from farm to school lunch is provided.

See the *Food Systems Process* Activity.

ASSESSMENT

Have students share their food system processes and ask them to identify ways in which they are different from each other. Ask if there is only one way that foods move through the food system or if there are multiple paths.

STEP/FOOD	PASTA	VEGETABLES	CHEESE
PRODUCTION	Wheat is grown and harvested.	Spinach, tomatoes, and mushrooms are grown and harvested.	Cows are raised and milked.
PROCESSING	Wheat is ground and refined into flour, and the flour is combined with other ingredients to make pasta and dried. The pasta is combined with the cheese and vegetables and packaged.	Vegetables are cleaned, chopped, and prepped for the lasagna. The vegetables are combined with the pasta and cheese and packaged.	Milk is pasteurized and processed into cheese. The cheese is combined with the pasta and vegetables and packaged.
DISTRIBUTION	The lasagna is shipped from the processing facility to the school district procurement facility.		
CONSUMPTION	The lasagna is cooked on-site at each local school and served to students.		

REFLECTION

Have students write about how what they learned about the food systems may affect their future food choices and their health.

EXTENSIONS

- Students can learn more about community food systems with the USDA **Community Food Systems Fact Sheets**.
- Students can also learn about possible careers in agriculture (and STEM) through this **Who's Who in the Food System** agriculture workforce handout.

SUPPLY CHAIN STEPS HANDOUT

PRODUCTION

1

This is when the food is grown (fruits, vegetables, grains, etc.) or produced (milk, meat, fish, etc.).

PROCESSING

2

While some foods remain unprocessed, others are shipped to another facility where they are processed (for example, strawberries being turned into jam or milk being used to make yogurt) and packaged.

AGGREGATION/ DISTRIBUTION

3

Once the unprocessed and processed foods are harvested and/or processed and packaged, they are distributed—or sent out to local markets such as grocery stores or restaurant suppliers.

MARKETS/ CONSUMERS

4

Finally, the consumers (such as families, restaurants, or schools) purchase the food and bring it to their tables.

(Image source: USDA)

COMMUNITY FOOD SYSTEM HANDOUT

(Image source: USDA)

FOOD SYSTEMS PROCESS ACTIVITY

STEP/FOOD			
BREAKFAST			
PROCESSING			
DISTRIBUTION			
CONSUMPTION			