



Let's Trace the Food System... From an Ear of Corn to a Bag of Doritos

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Theme:

- Food Systems
- Agriculture

Grade Level: 3-5; 6-8; 9-12

Subject Area: Social Studies, Economics

Summary:

This activity explores how our food is grown, processed and distributed. It is an interactive lesson in which students take on the roles of food system actors in the modern, industrial food system and a local, community food system. Students will first map the journey from a corn farm to a bag of Doritos chips. Then, they will map the journey from a corn farm to a farmers' market. Students of all grade levels can trace the "food dollar" in both food systems to demonstrate the flow of money in the agricultural sector. High school students can more deeply explore the environmental and economic impacts (including the energy consumption) of both conventional and local, sustainable food systems through further discussion. Younger students (grades 3-5 and 4-6) can focus more on the role that each actor in the food system plays and relate it to the food systems in their immediate community.

Learning Objectives:

- Students will learn the various steps our food goes through before it arrives on our table.
- Students will learn about the differences between sustainable and conventional forms of agriculture.
- Students will explore the differences between the global, industrial food system and a local, community food system.
- Students will examine the types of impact that different food systems have on the environment, people, and the economy.
- Students will examine energy consumption in the food production process from farm to fork.



Preparation:

Prep Time: 10 minutes

1. Gather all needed materials for the activity.

Time: 45 - 60 minutes

Materials:

- One ear of corn (or photo)
- One bag of Doritos chips
- Two printouts of large dollar bill
- One pair of scissors
- Food system actor name tags, printed out and made into signs for students to hold or wear
- Food system map materials from *French Fries and the Food System*
 - Sustainable: cards for each role of system-supplier, producer, retailer, CSA member and consumer. Arrows fit between each.
 - Conventional: cards for supplier, producer, processor, distributor, retailer, and consumer. Arrows fit between each.
- “Energy Used in Producing Food” worksheet from *French Fries and the Food System*
- List of definitions ready for reference and to share with students.
- Brochures or information about local farmers markets, if possible.

Lesson Procedure:

Part 1. Introducing the Food System

10 minutes

1. Hold up the two food items, the corn and bag of chips, and ask, “What are the differences between these two foods?” There are several differences here, visible and invisible. Pass the items around. Generate a list to get an idea of what the class thinks.
2. Now provide the class with more information. Tell them where you bought or harvested the corn and where it originated, and where you bought the chips. Ask the class to list the other differences between the two food items now that they have more information. If students throw out the word “organic” or “healthy,” ask them to clarify.
3. Finally, tell the group that the two food items come from two very different food systems. The corn grew locally and represents a more sustainable food system, while the Doritos came from much further away, is highly processed, and represents the global, conventional system.



4. Next, help the students define the phrase “food system.” Ask them to list the parts of their food system, and then help the class finish the definition. (refer to Definitions page.) Try to define a “system” first and then ask them to imagine what the “food” system could mean. Help them to see the general path; there is no need for specifics at this time.

Part 2. Conventional Food Systems: From the cornfield to a bag of Doritos

15-20 minutes

1. Announce to the class that they are now about to follow the journey of the Dorito chips. Have the food system player name tags ready. You will need about 10 student volunteers to participate for this section.
2. Start on a farm in a faraway state and begin again with the Supplier. Ask students what the supplier provides to a farmer in order to start the process of making Doritos. As students are able to describe the role, ask for a student volunteer to stand in front of the class as the Supplier and to read the definition of his/her role on the name tag provided. The student will stay at the front of the class wearing the name tag.
3. Move through each part of the food system (supplier, producer, processor, distributor, retailer, and consumer – with trucker as a food system player between each stage). One student will represent each actor in the food system and stand in front of the class to form a visual food system chain. Pass the ear of corn from the producer to the processor. Then introduce the bag of Doritos and have students pass it from the processor to consumer. Discuss each role as you travel through the system in relation to the stage of processing Doritos.
4. After the class has travelled through the whole food system to the consumer, introduce the “food dollar” prop. Hand the dollar bill to the consumer, who will pretend to purchase the bag of Doritos from the retailer.
5. Hand a pair of scissors to the retailer. Tell the food system actors that they should pass the dollar bill and scissors down the row back to the farmer. When they receive the dollar and scissors, they should cut off and hold on to the slice of the “food dollar” that they think they deserve for their work, whether they are the trucker, processor, retailer, etc. As they cut their piece of the bill, they must explain why they earned that piece of the money.
6. When a sliver of the dollar bill makes its way back to the producer (farmer), ask that student how he or she feels about his/her “paycheck.”



- Ask the class as a whole if they think the farmer earns enough money to keep farming and purchasing supplies from the supplier.
7. Conclude with a few general observations about how this food system works.
 8. Student participants return their name tags and materials and return to their seats.

Part 3. Local Food Systems: From the cornfield to the farmers' market.

15-20 minutes

1. Announce to the class that they are now about to follow the journey of the ear of corn. Have the food system players name tags ready again. You will need about 5 student volunteers to participate for this section. Make sure all new students participate in this part.
2. Start on a farm in Northwest Michigan (or within the state) and begin again with the Supplier. Ask students what the supplier provides to a farmer in order to start the process of growing corn. As students are able to describe the role, ask for a student volunteer to stand in front of the class as the Supplier and to read the definition of his/her role on the name tag provided. The student will stay at the front of the class wearing the name tag.
3. Move through each part of the food system (supplier, producer, and consumer.) One student will represent each actor in the food system and stand in front of the class to form a visual food system chain. Pass the ear of corn and discuss each role as you travel through the system.
4. After the class has travelled through the whole food system to the consumer, introduce the "food dollar" prop. Hand the dollar bill to the consumer, who will pretend to purchase an ear of corn from the farmer at a farmers' market.
5. When the dollar bill is handed to the producer (farmer), ask that student how he or she feels about his/her "paycheck." Ask the class as a whole if they think the farmer earned a fair amount of money for his/her labor.
6. Conclude with a few general observations about how this food system works—make sure to include observations about farmers' markets, direct consumer relationships, and the number of actors involved.
7. Student participants return their name tags and materials and return to their seats.



Wrap up:

1. When students have returned to their seats, ask the class how these two food systems are different, and how they are similar.
2. Generate another list on the board to record the differences and similarities.
3. To help guide discussion and students' understanding, use categories such as "Environment," "Economy," and "People's Health." Encourage students to think about the impact of food systems in terms of these specific categories.
4. When the class has generated a sufficient list for each category, ask students questions to summarize the lessons learned from the activity. Some sample questions include: *Which food system is better for the environment? Why? Which one allows small-scale farmers to earn more money? Which food system seems fair to you? Why? Which system produces more healthful foods? What does the food system in our town look like?*
5. At the end of class, hand out information about local farmers markets in your region and encourage students to visit farmers markets with their parents. Encourage students to think more often about the food system that brought the food to their plate.

Extensions: Grades 9-12

Energy Consumption

Use the "Energy Used in Producing Food" worksheet to continue the discussion about energy consumption and environmental impacts. Challenge students to consider all the ways petroleum is used to grow, transport, process, store, ship, and sell food. Examine the role of truckers (or transporters) and expenditure of energy between each stage of the Conventional Food System model, and compare it to the Local Food System model.

Grades 3-5 & 6-8

Local Food Systems

Use the Food system map materials from *French Fries and the Food System*. Divide class into two groups (or more for smaller groups). Provide each group with either the Local or Conventional food system map materials. Assign a specific food to each group (apples, corn, potatoes, eggs, cheese, bread, etc). Challenge students to rebuild the food system with the cards while envisioning the specific food system players involved in producing that food item. After 10



minutes of small group discussion, regroup as a class. Each group will present their findings.

Lesson Resources and/or Credit for Adaption:

Lesson adapted from the activity “Trace the French Fry: An Introduction to the Food System” from *French Fries and the Food System* published by The Food Project.

Helpful Definitions:

Food System: “A food system involves the functions of production, processing, transportation, storage, marketing, preparation, consumption, disposal, and decomposition. It can be visualized by imagining all the steps for bringing food from the land or sea to the table and back to the land or sea.”

Community Food System: There are several words being used to describe an alternative to the current national and global food system. Community, local, regional and sustainable food systems all refer to similar concepts. A community food system is defined as one “in which sustainable food productions, processing, distribution, and consumption are integrated to enhance the environmental, economic, and social and nutritional health of a particular place.” These regional, community food systems are being developed as a response to industrialized agriculture, driven by agribusiness (large corporate food producers), and its impact on the environment, family farms, consumers, food safety, and the quality of life in rural communities.

Conventional Agriculture: Since the end of World War II, there have been dramatic changes in agriculture. Food productivity soared due to new technologies, mechanization, increased chemical use, specialization and government policies in the 1940s and 50s. These changes allowed fewer farmers with reduced labor demands to produce the majority of the food in the U.S. This trend is often called the *industrialization of agriculture*, a process by which fewer and much larger farmers are producing the majority of our food, and corporations and multi-national firms are controlling production operations. Government subsidies for large-scale food production continue to make it hard for small producers to survive. For example, less than 20% of the largest farms (\$1 million or more in sales) in the U.S. are responsible for over 80% of total production.



These farms, with their subsidies, are putting the small, family farmer out of business.

Organic Agriculture: In the past two decades, a growing movement has been questioning the impacts of conventional agricultural methods. Topsoil depletion, groundwater contamination, the decline of family farms and rural communities, poor labor conditions on farms, and increased costs of production due to capital intensive methods have all been linked to conventional agriculture. The recent surge of interest in organic and sustainable agriculture has been a response to find more socially and environmentally beneficial ways of growing food.

The Organic Trade Association defines the term *organic* according to the national organic standards definition passed in 1995: “Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.” As a more simplified definition for students, *organic* can also be defined as a production practice using very little, if any, synthetic chemicals. (This includes chemical fertilizers, herbicides, pesticides, and insecticides.) Alternatives include using organic fertilizers, compost, and cover crops for fertility and using beneficial insects, physical barriers, and companion planting to manage insect populations.

Sustainable Agriculture: Sustainable agriculture integrates three main goals—environmental health, economic profitability, and social and economic equity. It is a method of farming where the farmer must think about the long-term implications of his or her farm practices and make choices based on the interactions of the whole farm ecosystem, including plants, animals, insects and soil life. There are no set standards for sustainable agriculture like there are for organic agriculture; therefore, the labeling of a farm as sustainable is still a matter of opinion among working farmers and professionals.