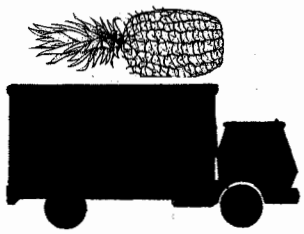


Farm to Table[1]

Calculate the travel costs for foods you consume

Recommended Grades: 5 and up

- **Math**
- **Language Arts**
- **Life Skills**
- **Health**

Goal

Trace the path of food production, and identify food's hidden costs from shipping, processing, advertising/marketing, packaging, pollution, fuel and energy use, and waste disposal.

Key Points

- A portion of the price we pay for food goes to the farmer, the bank, the seed company, the factory, the trucker, the store, etc. (contributing pieces of the profit "pie").
- Every year, farmers get paid a smaller and smaller share of that food cost "pie."

Background

Most of us take for granted being able to eat fresh produce from across the country and around the world all year long. Amazingly, just *getting* food from the farm to our plates now uses almost as much total energy as was used to grow it! Food prices are the sum of four costs: the raw materials; making it (production); moving and storing it (through all the stages of production and distribution); and marketing. Many of these four costs have additional features about them that we need to factor into the total, but which aren't counted now. Hidden costs such as health effects of highly processed products, and the environmental toll on natural resources by large-scale mono-cropping and controversial land-use practices, as well as production of more waste, make it difficult to calculate the actual cost of our food. The relative amount of money we pay for our food does not take any of these other factors into account; it is more determined by how much the consumer is willing to pay.

Long-distance food shipping is the norm today; most people live in coastal or urban areas and less than 2 percent of the U.S. population still works on farms. Everything that is done to a food—whether it is being grown, processed, or trucked—needs energy, and most of that energy comes from fossil fuels such as oil, coal, or natural gas. A little more than

[1] Activity inspired by "Food on the Move" in "Travelling Lunch" from *Project Seasons* by Deborah Parrella, Shelburne Institute, 1995. Used by permission.

half of U.S. transportation energy is consumed by cars, pickup trucks, utility vehicles, and vans; freight trucks accounting for another 23 percent.[1] There are at least two big problems with burning up large amounts of fuel to run our food system: one is that fossil fuels are nonrenewable—eventually they'll run out. The other problem is that burning these fuels causes pollution.

- Farmers receive less of every consumer dollar spent on food now than they did 50 years ago. In 1952, farmers received 41 cents of every consumer dollar compared to 21 cents in 2001.[2] Invert those numbers to see that 79 cents of every dollar spent at the market never makes it to the farmer, but to the various players in-between the farmer and you. This increasing loss of income explains why there are 300,000 fewer farmers today than there were in 1979.
- If a typical loaf of bread in your area costs $1.50 to buy, how much would the farmer get if the farmer were paid 21 percent of its price?[3]

Getting Ready

Have students research a list of commonly produced foods and their sources. You may choose to have students bring in their own packaged foods from home.

What You'll Need

Various food packages with easy-to-read labels such as breakfast cereal, juice containers, cookies, crackers, snack foods, etc. (enough for all students in the class); map of the Western Hemisphere or a globe; mileage key; price per gallon/liter of diesel fuel in your area; Where Did My Food Come From? handout (page 126). You may choose to use yarn or string to measure from point to point on the map, and then measure the piece of yarn to calculate mileage.

Teacher Tip

Following the introductory parts of this lesson, 1) take a field trip to a grocery store to learn the origins of some foods or 2) send your students out with a homework assignment to locate the origins of some foods and the local price of diesel fuel.

How to Do It

Begin by describing the path food takes from seed to table in general terms. (See Background or Figuring Out Our Food System lesson on page 44.) Hold up a packaged food item that children often eat. Ask students: What is in this food—what do you think are its ingredients? Where did this food item come from? Using this product, have the group brainstorm the path of one specific, fairly common ingredient from the product, such as corn or wheat. Guide them to include planting, tending, harvesting, processing, transporting, packaging, wholesaling, and advertising. As students are figuring out how a food product is made, record their ideas. Then help them determine the sequence of steps in the process. (For example: which comes first, the packaging or the advertising, the addition of sugar or the raisins or the ____ ?)

Next, show them food items with labels depicting where the food was produced. (Note that not many foods list their place of origin. Ingredient labels list foods in order of highest to lowest quantity. The Nutrition Facts label lists nutrient and guideline percentages and amounts.) Discuss whether or not the farm that grew this food might be near the processing factory. How could we find out where a particular canned item (for example) was grown? (From the labels or information from the grocer or manufacturer, or websites listed in Resources below.) List the origins of as many of the food items as you can.

Then, locate on the wall map or globe the geographic origins of the foods and the route they may have traveled to get to your local market. Have students estimate mileage. (Use the Where Did My Food Come From? handout with them as they work in groups or pairs. Refer to Resources for additional help.)

Most of our food comes by truck, so figuring the local cost of diesel, and using the figure of approximately 6.5 miles per gallon (2.9 km/L) that a trucker gets from diesel fuel, what would be the cost just for shipping by truck? (The average mouthful of food is estimated to travel 1,500–2,500 miles,

[1] Office of Technology Assessment (OTA), *Saving Energy in U.S. Transportation* (Summary) 7-8 (1994).
[2] USDA Market Basket values, as of 2000. www.ers.usda.gov
[3] Ibid.

or 2,500-4,200 km. (So 1,500 miles/6.5 mpg = 231 gallons @ $1.20 per gallon = $277.20.) What are some of the other hidden costs you could include? (Pollution caused by truck exhaust, energy use in refrigeration, packaging, costs for disposal, etc.—all VERY hard to quantify.) What are some of their findings?

Try to figure out the food that has the least "frequent traveler" miles or kilometers and encourage having that food as a classroom snack, provided that it's healthful, which odds are it will be!

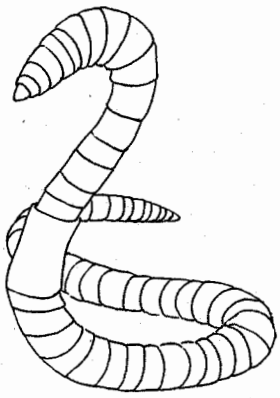
Classroom Conversations

- Is shipping food long distances an absolute necessity of life today? Why or why not?
- What if everyone in the world used as much energy as the United States does to produce food—how long would our fossil fuels last? (There is no consensus among the scientific and energy communities about how long current energy supplies will last.) Incidentally, the United States consumes about one-third of the world's transportation energy, however it accounts for only about 5 percent of the world's population.[1]
- Have students consider (and further research!) the amount of water used, waste produced, and energy consumed by an average U.S. student.[2]
- Discuss this statement by Albert Bartlett of the University of Colorado: "Modern agriculture is the use of land to convert petroleum into food."[3]
- What would life be like without oil or gasoline?
- Refer to the Dietary Guidelines for Sustainability (Appendix) and evaluate whether or not some of the foods the class has already discussed fit these particular guidelines.

Want to Do More?

- Have students complete the worksheet using foods in their homes and then share their findings with their families.
- Use various packages and take them apart, measuring actual area of packaging—including inner liners—to demonstrate how much packaging can add to cost/waste stream and energy usage.
- Figure out your class's fossil fuel savings by charting how many times you rode a bike, walked, skateboarded, or use some other non-motorized form of transportation over a specific time period. Make a chart including the activity, the distance traveled, and calculate savings based on the following pollutants or greenhouse gases: carbon monoxide, nitrogen oxides, and carbon dioxide. Get pollution and greenhouse gas figures from the Environmental Protection Agency: www.epa.gov/students/
- Take a tour of a food processing plant in your area. Ask the tour guide or manager where their product's ingredients come from.

With the amount of fuel that we use to produce one loaf of bread (to grow the wheat, grind the flour, bake the bread, and transport it), people in some countries could produce fifty loaves. The difference is that we use fuel to run machines and transport our bread over long distances. They use more muscle-power and eat bread that was produced locally. It takes the energy of approximately ten car tanks of gasoline to feed you for one year. That's about 130 U.S. gallons (or 500 liters). How much energy would our food system use to feed all 6 billion people on earth?



Action

Choose one product that the class deems to have the most unnecessary packaging. Write a letter to the manufacturer asking them why there is so much packaging, and whether they could reduce the amount of packaging they use.

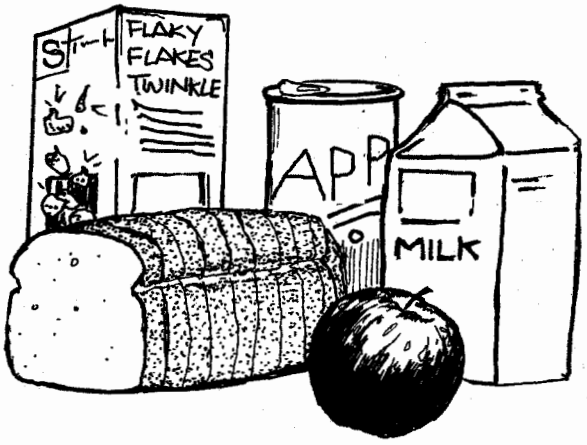
Lesson Links

What Is Locally Grown?
Dollars and $ense
Once Upon a Farm
Figuring Out Our Food System
It All Adds Up

[1] Environment and Energy Study Institute Fact Sheet, "Oil and Transportation," cited in *Getting There*, Washington, DC: The Advocacy Institute; 14, 30; 1996. U.S. Census Bureau. http://blue.census.gov/: U.S. population 288,663,524; world population 6,261,066,212

[2] For those students born in the United States, by 75 years old they will have produced an average of 52 tons of garbage, consumed 10 million gallons of water, and used 5 times the energy of a child born in the developing world. National Wildlife Federation;. www.nwf.org as quoted in http://population.newc.com

[3] "Forgotten Fundamentals of the Energy Crisis," by Albert A. Bartlett, University of Colorado at Boulder; www.npg.org/specialreports/bartlett_section3.htm



Where Did My Food Come From?

Name _____ Date _____

Look at the label of the food product you have. What is the food and its major ingredient?

Where does that major ingredient come from? Find that location on the map.

How far is that from your home? (Use map distance key.)

What steps did this food go through between being picked in the field and sold in the store? List as many as you can think of. (Consider examples discussed in class.)

How do you think this item was transported? Truck? Plane? Train? Other?

How much time do you think it took to get from field to table?

What resources might have been used in getting it here—topsoil, gasoline, diesel fuel, oil, water, coal, solar, other?

Is the container recyclable?

What happens to the waste products from making this?

Handout from *Healthy Foods from Healthy Soils* by Elizabeth Patten and Kathy Lyons, Tilbury House, Publishers.

Literature Links

Eat Up! Healthy Food for a Healthy Earth by Candace Savage
Feeding the World by Janine Amos
First Day in Grapes by L. King Perez
One Good Apple by Catherine Paladino
Supermarket by Kathleen Drull

Resources

- For color maps of commonly grown national agricultural commodities by county see the USDA National Agricultural Statistics Service site: www.usda.gov/nass/aggraphs/cropmap.htm
- See also USDA, Cooperative Extension Service for information on your state's crops.
- For rankings of major crops by state, see http://usda.mannlib.cornell.edu/datasets/crops/9X180/98180/1/cropsst.txt
- See American Farmland Trust for agricultural crop statistics and practices: www.farmland.org
- See *Project Seasons* by Deb Parrella, Shelburne Institute, 1995, for additional activities about food transportation. Note activity "Travelling Lunch."
- Ask school food service personnel for food origin information, particularly of commodity foods available to school districts nationwide.
- See *Earthfriends* "Whole Story of Food" for further activities looking at the origin and the biways food travels. EarthFriends, 525 West 120th St., Box 188, New York, NY 10027; 212-678-3955; or Pamela Koch at 212-678-3001.
- Hunger: The Community Food Security Coalition is dedicated to building strong, sustainable, local and regional food systems that ensure access to affordable, nutritious, and culturally appropriate food for all people at all times: www.foodsecurity.org

Benchmarks

The Designed World: 8A—Agriculture, pp. 183-84

The background section for all the *Benchmarks* states, "Primary-school children may have only vague ideas about where their foods . . . come from. So the first steps in teaching children about agriculture are to acquaint them with basics: what grows where, what is required to grow and harvest it, how it gets to the stores. . . . Projects to trace locally available food . . . to their origins are helpful in providing at least some personal experience."

Grades 3-5

The background section states, "Where possible, students should . . . examine trucks, trains, cargo planes, and as many other parts of the 'technological food chain' as possible."

The last *Benchmark* states, "Places too cold or dry to grow certain corps can obtain food from places with more suitable climates. Much of the food eaten by Americans comes from other parts of the country and other places in the world."

Habits of Mind: 12B—Computation and Estimation, pp. 290-91

Grades 3-5

"Add, subtract, multiply, and divide whole numbers mentally, on paper, and with a calculator."

Grades 6-8

"Estimate distances and travel times from maps. . . ."