

Where in the World?

Summary:

Students will investigate the origin of various food items by using maps and/or Google Earth to calculate food miles.

Learning Objectives:

- To develop an understanding about where our food comes from
- To develop an understanding about food seasonality
- To understand the connection between food production and natural resources
- To understand how buying locally produced food helps local economies and the environment
- To use maps and/or Google Earth to calculate “food miles”

Skills:

- *Geography* – reading maps and using scale to figure out distances
- *Math* – converting km to miles, calculating how much gasoline used and cost of transporting food item
- *Science* – environmental responsibility, natural resource use

Materials:

- Food items (enough for multiple groups)
- Rulers and/or computers that have Google Earth
- Sticky dots (to mark food locations on map)
- World maps

Background:

Before beginning the activity, ask students “Where does our food come from?” Some answers may include the supermarket, the gas station, Wal-Mart, a farm, or the farmer’s market. Discuss the concept of “food miles” with students. Food miles describes the distance food has traveled from farm (or packaging/processing plant) to plate. Explain that food transport can be by plane, boat, or truck, or a combination. For example, imported food items may begin their journey by plane to a distribution center in the U.S, but they might continue to their final destination by truck. Big grocery stores and places like Wal-Mart have distribution centers all over the country. So it’s important to point out that the food being transported may not make a straight journey from its point of origin to its final destination, but may be dropped off and picked up multiple times before landing in the supermarket. Explain that historically, food was produced locally. People would eat fruits and vegetables grown nearby, or foods canned and packaged at local facilities. This often meant that the produce available to

them would be dictated by the seasons and/or what was able to grow in certain region (e.g. we can't grow pineapples or avocados in Alabama). Now, food is transported hundreds or thousands of miles to supermarkets so that we can have more choices of what to eat, and that we can eat many types of produce all year round. Here, you may choose to discuss the concept of food seasonality. Fruits and vegetables grow during specific seasons. The specific time frame during which certain fruits and vegetables grow depends on where you are. In Alabama, we have a mild climate, so we are able to grow many things for a lot longer than a state with a harsh winter, say for example Wyoming. Vegetables like tomatoes are available all year round, even though in Alabama they are traditionally grown in the summer. By importing tomatoes from Mexico, where there is a milder climate, or from places like California, where tomatoes are grown in greenhouses, we can extend the seasonality of tomatoes, and eat them whenever we want. You may also add here that even though certain produce is available at the supermarket out of season, it is often more expensive and of lower-quality during this time.

Activity:

Assemble food items that you would like to use in your discussion of food miles. Ideally, each food item should be marked as to its location of origin. If possible, try to avoid items that just say "Product of the USA". At least for domestic products, it would be better for students to see where food comes from on the state level. For foreign products, the level of detail may not extend that far. Potential food items may include fresh fruit or vegetables, and/or packaged, processed, or canned foods.

Divide the students into small groups. Give each group a world map, rulers, and 3-5 food items to "investigate". Students should identify which country their item came from and the distance that item travelled to get to their plate. Remind students that the origin label on processed/packaged foods usually denotes where the product was made, but the ingredients can come from a variety of different places. Have them record their results in the table provided. In addition, they should mark the location of each food item on the world map. Students will use rulers and the map scale to determine distances. You may have students answer questions after they have completed their investigation, and then have each group present their findings to the class. Students could also tape their food labels to a large classroom world map to show where each of their food items traveled from.

Alternative: Students may use Google Earth to calculate food miles. The basic version of Google Earth is free and available for download at: <http://earth.google.com>. Students can measure the distances between 2 places by using the ruler tool under Tools.

Possible Questions:

1. Which item had the highest "food miles"? the lowest?
2. Did you have any food items that came from the same place?
3. Did you have any food items that were the same (e.g. banana or tomato) that came from different places?
4. Are any of your foods able to be grown in Alabama? (this could also be a "take home" question that students could research)

Options that incorporate more Math:

Option 1: If the scale is in km, you may choose to have students convert their determined distances into miles.

Option 2: Tell students that the delivery truck gets x miles/per gallon. Ask students to figure out how many gallons of gasoline were used in transport. Also, using the current price of gasoline/diesel, have students calculate the amount of money spent on transportation.

Option 3: Have students calculate the *average* food miles of their products.

Discussion:

After students have completed their investigations and/or presented their discoveries to the class, it's time to put it all in perspective. Try to foster discussion by asking questions:

1. What have you learned about where our food comes from?
2. Why do you think food travels so far to get to us?
3. How does this affect our environment?
4. You found that fuel costs are a huge part of the overall costs of transporting our food. What are some other hidden costs? (packaging, refrigeration, chemical sprays)
5. How do you think food is affected by long transport?
6. What can we do to reduce our impact on the environment and/or food miles?

Discuss with students the relationship between food transport and the environment. Transporting food requires burning fossil fuels, which releases CO₂, SO₂, and particulate matter into the atmosphere and causes pollution. Explain that CO₂ is a greenhouse gas that contributes to climate change and global warming. Also, make sure they realize that the greater the distance the food has traveled, the more energy was consumed in bringing it to our plates. Relying on imported foods, or foods that are grown across the country (e.g. California) increases our use of a non-renewable resource – oil. Bring up the idea of cost of transport – they will have their calculations as to money spent on fuel alone – and explain that the costs involved in transport/production can show up in the final price we pay at the grocery store. Discuss the other potential costs of food transport –

- *Packaging:* What sort of packaging is used to keep the item fresh? You may also mention that plastic packaging is petroleum-based, i.e. even more oil is used in getting the item from farm to plate.
- *Refrigeration:* if the food is perishable it will require refrigeration (see below)

- *Freight Costs*: the costs associated with food transport on a train, plane, or boat
- *Customs Clearance*: if the food is coming in from another country there may be customs fees

Talk to your students about how food is transported without spoiling. You should mention that vegetables/fruits are often picked before they are completely ripened so that they can live for longer on a truck. Sometimes vegetables are artificially ripened using chemicals like ethylene, a hydrocarbon gas¹. Because produce is not allowed to mature on the plant, taste is often sacrificed. Also, food that has been traveling for many days and then sitting on supermarket shelves, will also taste differently than food that is fresh from a garden or farm. Manufacturers may use refrigeration during transport, which also contributes costs and uses energy. *Example: Kiwis imported from Italy to the U.S. travel in refrigerated containers by boat and take 18 days to get here*².

Introduce to your students the idea of eating locally. Ask the class if they know any farmers in town or in the state. Explain that eating foods that were grown closer to home will help reduce the amount of food miles, packaging, and processing, and thus lessen our impact on the environment. In addition to saving energy and money, buying and eating local foods also helps support our local economy – i.e. we are supporting the people of our state, and not other states or countries. When we buy foods at the supermarket, most of the cost of the item goes to suppliers, processors, or marketers. Only 3.5 cents of each dollar actually goes to the farmer³. In contrast, when we buy food directly from the farmer or at a farmer's market, we know that the majority, if not all, of what we pay is going back to the farmer who grew it.

Finally, pass out a small snack of local foods for students to eat and tell them where it came from. (*possible snacks*: local fruit that is in season, veggies with goat cheese dip, peanuts)

Extension Ideas:

1. The activity part can always be given as a homework exercise. Have students list five food items in their refrigerator or freezer, and investigate where each traveled from. Send them home with the table and world map. The discussion can be the following day. Let students tell the class what they found.
2. Alternatively, you could divide the class into two teams. One team would be given a hypothetical non-Alabama meal, composed of vegetables/fruits/meats from all over the country/world. The other team would be given an all-Alabama meal, composed of vegetables/fruits/meats from Alabama farmers. You could do the same exercise, and have the two teams present the differences in their findings.
3. Have students research one of the countries that produced some of the food they were investigating. Students can present their findings to the class.

Resources:

<http://www.sustainabletable.org>

<http://www.climatechoices.org.uk>

<http://www.agclassroom.org>

¹: Blakenship, S. (2000, March 14). "Ethylene: The Ripening Hormone". *16th Annual Postharvest Conference, Yakima, WA*. Retrieved from <http://postharvest.tfrec.wsu.edu/pgDisplay.php?article=PC2000F#s1>

²: Rosenthal, E. (2008, April 26). "Environmental Cost of Shipping Groceries Around the World." *The New York Times*. Retrieved from <http://www.nytimes.com/2008/04/26/business/worldbusiness/26food.html>

³: Pretty, J. "Some Benefits and Drawbacks of Local Food Systems." Briefing Note for TVU/Sustain AgriFood Network, November 2, 2001.

Where in the World?

Look at each of your food items and record the state or country your food was grown in. Use the map to calculate the total number of miles it traveled to get to your plate.

Basic Table:

Food Item	State/Country it came from	Miles traveled

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Alternate Table for Extra Math Options:

Food Item	State/Country it came from	Miles traveled	Gallons gasoline used	\$ of transport

