**Grade Level**

Upper elementary through secondary, 5-9+

**Content Areas**

Science – Environmental

Math – Functions & Algebra

**Standards/Goals**

Environmental Science 6.3:

The student will analyze the relationships between humans and the earth's resources

Functions & Algebra 1.1:

The student will analyze a wide variety of patterns and finctional relationships using the language of mathematics and appropriate technology

**Skills/Indicators**

**Environmental Science:**

6.3.1 Humans and air quality

6.3.3 Humans and land resources

6.3.5 Humans and energy resources

**Functions & Algebra:**

1.1.1 Recognize, describe and extend patterns and functional relationships

1.1.2 Tables and/or graph

# FARM TO TABLE:

## A Unit About Food Systems

**Venue: Classroom and/or Cafeteria**

**Time:** Five activities @ 20-30 min. per lesson

**Objectives:** Students will be able to -

1. Describe the life cycle of a food system
2. Discuss the true energy cost of food
3. Discuss how a specific fruit or vegetable goes from farm to table

**Materials:**

A bag of baby cut carrots and a bag of apples

Chart paper and markers or crayons

Index cards, pack of 50

Student copies of the Maryland Agriculture Top Commodities map

Hand-outs, provided

# Farm to Table: A Unit About Food Systems

**Teacher Background:**

Our modern food systems are large and complex, often involving a variety of transportation, processing, labor and agricultural systems that reach around the globe. Because of this complexity, the modern food system is unusually brittle, tied as it is to global economic, energy and political structures. Additionally, food that travels long distances has serious consequences for our environment and incurs hidden costs not evident to the average consumer.

As consumers, parents, grandparents and educators, it is to our benefit and the benefit of our children, schools and communities to make ourselves aware of the true cost of food. Advocating for higher quality, more healthful foods grown and purchased closer to home is one step schools and parents can take to protect the health of our children and our environment. Buying local at any scale adds to the economic resilience of our local communities.

The Farm to School program is a national effort to encourage schools to consider purchasing from local farms. Besides the tremendous health benefits to serving and eating minimally processed foods, students and their families may discover the benefit their food choices have for their communities. Maryland is proud to county nearly every county as members of the MDA Farm to School initiative!

*For more information and additional lessons:*

Maryland Department of Agriculture, Jane Lawton Farm to School Program:

http://www.mda.state.md.us/mdfarmtoschool

National Farm to School: www.farmtoschool.org

National Ag In The Classroom Consortium: www.agclassroom.org

# What Do Students Know About Food Miles?

**Activity:**

On the board or a piece of chart paper record student responses to the following questions:

1. Where did these apples come from?
2. Where did this bag of baby carrots come from?

**Discussion:**

How did you know the origin of these foods?

Did you guess?  Were there clues? Were your answers based on experience?

Why is important to know **where** our food comes from?

Why is it important to know **how** our foods come to us?

# Understanding a Transportation System

**Activity:**

Divide students into small groups of three to four students. Give each group a sheet of chart paper and some markers or crayons.

Ask students to draw a building in the center of the paper to represent their school. Have students think about what needs to happen in order for them to get from their bed to their desk each day. Have them draw a map showing the route and mode of travel to and from school. If students walk to school, have them draw the sidewalks and paths they take. Commuters should include highways, roads, gas stations, bus stops. If their trip from school to home is different, have them draw this system as well.

Explain to students that they have mapped a system!

Ask students to identify parts of the system that make it possible for them to get to and from school.

- Drivers
- Vehicles
- Crossing guards
- Gas stations
- Sidewalks
- ?

What ways of travel to and from school are healthiest for you and our environment? Why? Explain to students that much of our food travels great distances and uses many kinds of **transportation** to arrive on our plate.

# The Maryland Top Commodities Map

**Activity:**

Keep students in their small groups and give each a small **Maryland Ag Top Commodities Map.** Explain that symbols on the map represent the top three agricultural products for that county. Locate the county where they live and go to school. What are the top three agricultural products for your county?

**List on board**: Top commodities: 1. _____ 2. _____ 3. _____.

Be sure to explain that lots of other foods are grown in Maryland's counties as well – even in Maryland's cities like Baltimore and Frederick! Can students think of where the closest farm or garden is in relation to where they live? What kinds of agricultural products do they see grown in their county or city? Vegetables? Fruit Trees? Corn? Dairy? If students do not have access to farms, farmers markets or gardens in their communities, discuss ways they may be able to learn more about agriculture in their county. (See Resources)

**List on board:** Foods grown in my community (or city/county)

When we grow , buy or eat food we are part of a food system with lots of working parts like the transportation students drew earlier. Can you think of anyone who is *not* a part of a food system? Why? Why not?

# FOOD MILES – TRUE COST

Name _____

Did you know that most of our food travels **1,500 miles** to get to our table? That's a lot of travel! Food transportation uses a lot of fuel, whether it travels by truck or plane. This is not very healthy for our environment and adds hidden costs to our food systems.

**Make a graph or table to compare the following categories of origin for apples using your answers to the questions below.**

1.) The **State of Washington** is one of our nation's top producers of apples. **Washington County in Maryland** also produces many of the same kinds of apples. How far away is Washington State from Maryland? Check an atlas, MapQuest, or a U.S. states map and compare the distance in miles from your school.

2.) The standard transportation for apples from Washington State is by 18 wheeler truck, which get on average 4 miles per gallon of diesel fuel. How much would it cost in fuel to deliver a load of Washington apples to your school district? How many gallons of fuel are used?

# MAP YOUR FOOD – FARM TO TABLE


Can you find Maryland on this U.S. state map? Put a GREEN dot on MD!

Can you find Washington State? Put a RED dot on WA!

How many states would a truck driver have to drive through to deliver Washington State **apples** to Maryland? _____

Can you find Washington County, MD on the U.S. map? Put a BLUE dot!

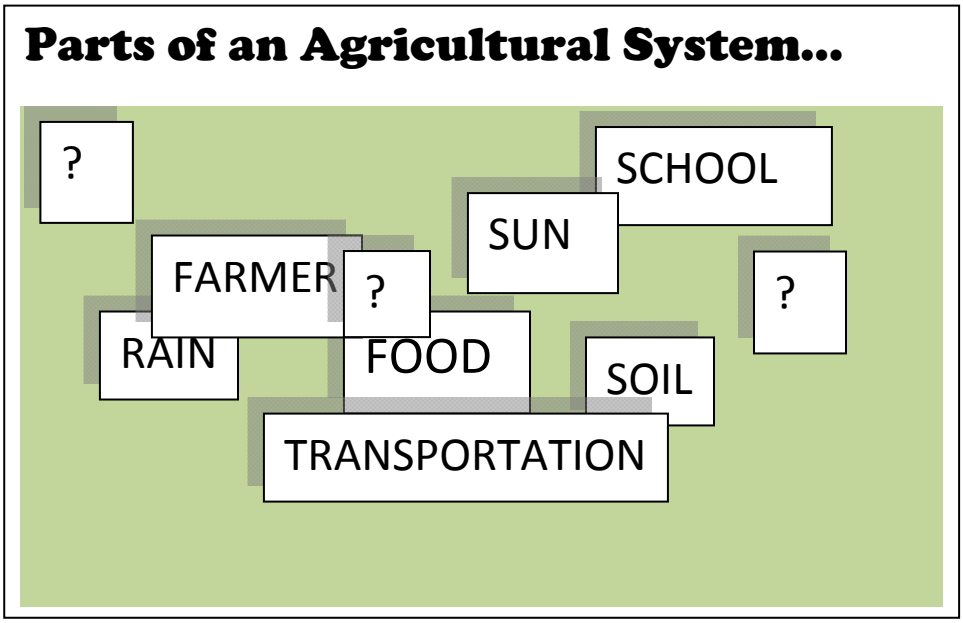
**Carrots** are grown in many gardens in Maryland. But most of the bagged carrots you see in stores are grown far away in California – even in other countries!

Where did the bagged carrots come from? _____

# Interconnecting Systems and Agriculture

**Activity:**

There are many kinds of systems that bring food from the farm to your school lunch. **Agriculture** is a mix of **natural** (ecosystem) and **social** (human) systems that not only fuel our bodies but fuel our economies. Being aware of where our food comes from and how it travels is a way to consider the transportation system and its impact on our environment. Buying food grown locally is great for Maryland farmers, our environment and your health!




Create a concept map to link the different parts of an agricultural system. How many systems can you include to show how agriculture is part of a larger complex system which feeds our communities and families?

# Comparing Food Systems

**Activity :**

Create a systems map for each of the scenarios below.

| **Scenario A: Salsa From a Can** | **Scenario B: Salsa From the Farm** |
|---|---|
| Southside School uses canned salsa for many of its school lunches. The salsa contains tomatoes, onions, peppers grown in Mexico and California. The vegetables are processed and may include sugars and preservatives for long term storage. The canned salsa is shipped from California to trucking centers in Ohio. From Ohio, the cans are delivered to several states. Southside School in Maryland receives the salsa from a huge truck that delivers to schools throughout the county. | Northside School would like to order fresh vegetables from local farmers who grow all the vegetables needed to make fresh salsa. Though it will take extra time to prepare fresh salsa, the farmers work together to arrange for a local driver to pick up and deliver the fresh vegetables each Wednesday. Students will have the opportunity to learn from the cafeteria staff, parents and teachers how to make salsa and celebrate with a wonderful meal! |

Compare the two concept maps:

- Where might there be hidden costs or benefits to human health, the environment and local communities?
- Explain that hidden costs and benefits may not necessarily be measured in dollars and cents – these costs and benefits may be measured in other ways such as air quality, strength of farm communities, time needed to prepare and process foods, etc.

# A Food Systems Web Game!

Have students stand in a circle, shoulder width apart, facing in. Join the circle. Declare yourself hungry! "I am so hungry, I think I'll take a look inside my 'fridge and see what's to eat." Pretend to be opening the door and peer in. " I see strawberries!"

Hold one end of a ball of red yarn (the strawberry) and toss the ball to a student as you say thank you to the farmer who grew them. The student (farmer) says "Your welcome! And I'd like to thank ……." as he or she names a person or service that helped the farmer grow, process and deliver the strawberry to you. The farmer holds the connecting length of yarn to you, while throwing the ball to another student, thanking them for playing a role in the food system that brings fresh food to schools. Don't forget to thank your cafeteria staff!

Each student in the circle will eventually have a section of the yarn and will have been given a role to play in the food system. The circle will look like a giant spider web!

When everyone has a section of the yarn, give your section a tug and see who feels it. Chances are several students will feel the pull. Explain that when one part of the system feels stressed – i.e. a spike in gas prices, the cost of fertilizer, too much rain, etc. - the other parts of the system feel the stress as well.

What are the consequences of stress to a food system? Try several scenarios including a failure of a system within the web and discuss the outcomes. How can we create and maintain systems that are more resilient?

## Food Systems and YOU!

Name _____

Match the concept to the system. Be able to explain your choices. Think about how you are part of these systems!

| | |
|---|---|
| Weather, soil, air and water | Processing system |
| Preserving and packaging | Economic system |
| Planting, growing, harvesting | Nutrient system |
| Shipping and delivery | Distribution system |
| Fertilizer, manure, healthy soils | Ecosystem |
| Preparing, serving and eating | Food Service System |
| Cost, payment, income | Farming system |

**Literature Link**

Pamela Gould *Feeding the Kids: Healthy Eating Systems for the Whole Family*

264 pages , Mancala Publishing, LLC; 1 edition (March 10, 2007)

**ISBN-10:** 0978938542

**ISBN-13:** 978-0978938543


**Cafeteria Link**

Conduct a poster Contest for mapping the local food system.

Invite students to tally the foods used in your school to see where they originated and how far they traveled to get to your cafeteria.

Invite students to use the cafeteria to work on their large floor maps and to provide an opportunity for nutrition staff to engage directly with students in the making of their maps

**Notes:**