**The relationship between agriculture and the economy**

**Pillar 6 E. Describe how the relationship of supply and demand impact prices of agricultural commodities.**

 (9th – 12th Grade)

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| **Video**: <https://www.youtube.com/watch?v=0M7rcZybO1Q>**Hands On**: <http://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=29&grade=9&author_state=0&search_term_lp=trade>  |

**Filling the Global Grocery Bag**

**Purpose**

Students learn what factors affect a country's ability to produce their own food and how food expenses differ throughout the world.

**Materials**

**Activity 1:**

* *Farming Around the World* PowerPoint
* *Farming Around the World* handout, 1 copy per student
* *Snapshot of Agriculture* handout, print 1 copy per class front to back

**Activity 2:**

* *USDA Food Expenditures by Country* table

**Essential Files (maps, charts, pictures, or documents)**

* [Farming Around the World PowerPoint](http://naitc-api.usu.edu/media/uploads/2016/04/25/Farming_Around_the_World.pptx)
* [Farming Around the World handout](http://naitc-api.usu.edu/media/uploads/2016/04/25/Farming_Around_the_World_handout.pdf)
* [Snapshot of Agriculture handouts](http://naitc-api.usu.edu/media/uploads/2016/04/14/Snapshot_of_Agriculture_handout.pdf)
* [USDA Food Expenditures by Country table](http://naitc-api.usu.edu/media/uploads/2016/04/14/USDA_Food_Expenditures_by_Country.xlsx)

**Vocabulary**

**Arable:** suitable for growing crops

**Climate:** the prevailing weather conditions in a specific area over a long period of time

**Growing season:** the portion of the year where rainfall and temperature allow plants to grow

**Income:** monetary payment received from work or other sources of payment

**Open space:** portions of land that are not developed with buildings or other structures; areas where space can be utilized for farms and the production of food

**Temperate climate:** climates that are generally moderate, not extremely hot or cold; changes between summer and winter are minimal

**Did you know? (Ag Facts)**

* In proportion to total income, Americans pay the least for food when compared to other countries.1
* People in developing countries spend the highest percentage of their income (over 40%) on food.2
* Grains make up 45% of the world's diet.2

**Background Agricultural Connections**

When we enter a grocery store in the United States we are surrounded by a wide variety of food. Our food ranges from highly processed prepared meals to fresh produce, meat, and dairy products. Why do American grocery stores have such a large variety of food? America is a large country that includes many climates, various types of soil, varying degrees of annual precipitation, as well as access to machines and other technologies that maximize a farmer's ability to produce our food. How do each of these factors affect a country's ability to produce food?

**Interest Approach – Engagement**

1. Visit National Geographic's webpage titled [*What the World Eats*](http://www.nationalgeographic.com/what-the-world-eats/). Project the webpage for students to see. Explain that each pie graph represents an average representation of each country's diet. It is represented in total daily calories as well as being broken down into food groups.
2. Explore and compare the pie graphs with students by having them guess and find the answer to the following questions:
	* "Which country consumes the most daily calories?" *(United States)* "Which country consumes the least calories?" *(Somalia)*
	* "Which country or countries proportionately consume the most/least grains*?*Can you think of a reason why?"
	* "Which country or countries proportionately consume the most/least meat? Can you think of a reason why?"
	* (Continue with other food groups until your students have a general idea of diets worldwide)
3. Summarize what students have learned from this webpage by pointing out that first world countries typically consume the most calories per day. Third world countries typically consume the least. Ask your students, "Since Americans consume the most calories, do you think they spend the highest proportion of their income purchasing their food? Do you think under developed countries spend the smallest proportion of their income to purchase groceries?" Explain to your students that they will be learning the answers to these questions.

**Procedures**

**Activity 1: What factors affect a country's ability to produce their own food?**

1. Ask your students where their food is produced *(farms)*. Next, ask them where farms are located *(worldwide).*Explain that in the United States we have a plentiful food supply of a large variety of foods. At our grocery stores, we can purchase fresh produce year-round.
2. Display the *Farming Around the World* PowerPoint. Using the map on slide 2, ask your students if every country throughout the globe has the same factors influencing their food supply. Ask questions such as, "How do farms vary throughout the world? What crops are grown in which areas or countries? What animals are raised? Do farming practices vary? Why?" Brainstorm some of the differences your students imagine can be found on farms from continent to continent.
3. Give each student 1 copy of the *Farming Around the World* handout.  Using the PowerPoint and the handout, explain to students how the following six factors impact food production in various parts of the world. Students will take notes throughout the discussion following the example pictured to the right.
	* **Climate:** Climate plays a large part in a farmer's ability to grow crops and raise the livestock that provide our food. Climate refers to the weather and seasons in a given area. Factors such as the length of a growing season and temperature are critical to successful crop growth and harvest.
	* **Open space:** Whether growing crops or raising livestock, farmers need open space to farm. Some countries have ample open space and others have little open space with high populations creating difficulty to provide food for their own population.
	* **Soil Quality:** Not all land has *arable* soil, or soil that is suitable for crop growth. Some soils are too sandy or contain too much clay and don't hold adequate nutrients or proper water drainage or absorption. Other soils may not be suitable to grow crops such as fruits, vegetables, and grains, but they are suitable to grow grasses which provide feed for livestock.
	* **Water availability:** Water is a limited natural resource that is necessary to farming. Too much or too little water can be detrimental to a farm. Water requirements vary by crop.
	* **Available Technology:** Farming requires a great deal of physical labor. Technology and machinery help to ease this burden and allow a farmer to produce more food. However, in some countries, particularly third world countries they may not have access to these advancements or may not be able to afford them. Technology also allows for food to be transported longer distances and preserved for later use.
	* **Economics and Government:** Forms of government such as capitalism and socialism impact farming. Government policies may encourage or discourage farm production. Market pricing of agricultural crops, government subsidies, and regulations applied to farming practices may all impact farming in a positive or negative way.
4. Once all six factors have been discussed, ask students which one is most important. Allow students to think about this question and help them understand that they are all important. These six factors influence farm productivity. If one factor is less than optimal, food production will be limited. Illustrate by giving examples such as:
	* **Deserts:** These areas have plenty of open space, a hot climate, and sandy soil. However, without adequate water, crops will not grow.
	* **High elevations:** Many mountain areas of the world have ample open space, fertile soil, and plenty of available water. However, the climate is cold leaving only a very short growing season in the summer that is not adequate time to plant and harvest a crop.
	* **Cities:** A large concentration of people live in most cities. Even if there was an ideal climate, soil, and water available there would not be space for a farm.
5. Divide your class into 12 groups. Give each group a *Snapshot of Agriculture* handout. Instruct students to research the country they have been given and find the answers to the questions contained on the handout. Have student groups share with the class what they learn about their assigned country. These facts will prepare students for *Activity 2.*
	* **Optional Activity:** If your students can access Google Earth, assign each group to make a Google Earth Farm Tour of their country showing the landscape and terrain of the country along with any farms they can locate through an internet search. Many tutorials can be found on YouTube to learn how to create a "virtual tour." Farm images can be found through a Google image search. Encourage students to accurately find the location of the picture as well as to be sure the image represents a common agricultural practice.

**Activity 2: How do grocery bills differ throughout the world?**

1. After completing *Activity 1*, students should be able to understand the factors affecting a country's capability to produce food. Introduce the concept that culture also plays a role in eating habits and dietary choices.
2. Ask students to brainstorm a list of things families in the U.S. spend money on. Organize the items into expense categories (food, clothing, housing, recreation, transportation, etc.)
3. Prioritize the list beginning with the most essential category leading down to the least essential category. Discuss how priorities would change if your available budget became smaller. Which categories would they decrease their spending if the need arose?
4. Display the attached table, *USDA Food Expenditures by Country*. This table can also be accessed directly through the [USDA website.](http://www.ers.usda.gov/data-products/food-expenditures.aspx#26636) Have students begin to make observations about the statistics and find correlations.
5. Show students the [*Hungry Planet: What the World Eats*](http://time.com/8515/hungry-planet-what-the-world-eats/) photos. Each picture has a family in various parts of the world along with the groceries they would consume in a typical week.
6. As you view the pictures, encourage students to apply what they have learned so far and discuss the culture, geographic locations, and the average cost of food for each group as you view the pictures.

**Concept Elaboration and Evaluation**

1. Introduce students to *Engel's Law* and explain that in economics, as income rises, the proportion of income spent on food falls, even if the actual expenditure on food rises.
2. To summarize this activity, refer back to the questions posed in the *Interest Approach*. "Since Americans consume the most calories, do they spend the highest proportion of their income to purchase groceries? Do you think under developed countries spend the smallest proportion of their income to purchase groceries?"
3. Review and summarize the following key concepts:
	* Agriculture is a global economy.
	* Agricultural resources vary from country to country. Not every country has an adequate climate, natural resources, skills, or technology to produce and access a healthy food supply.
	* Many under-developed countries face economic challenges in being able to provide food.

Essential Links

* [USDA Food Expenditures website](http://www.ers.usda.gov/data-products/food-expenditures.aspx#26636)

Enriching Activities

* Have the students Google a grocery flyer from a different country. Have them use the items on the flyer to purchase and plan a week's worth of meals for a family of four.

Suggested Companion Resources

* [Interactive FAO Hunger Map](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=721) (Poster, Map, Infographic)
* [World Hunger Map](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=810) (Poster, Map, Infographic)

Sources/Credits

1. <http://www.ers.usda.gov/data-products/food-expenditures.aspx#26636>
2. <http://www.one.org/us/2014/11/12/14-surprising-stats-about-global-food-consumption/>