

Grocery Bags Gone Global

Purpose: Students learn why people around the world spend different percentages of their annual income on food. They use this information to investigate and compare how the environmental and physical features of a country impact the food and culture of the population.

Time: 60 min

Level: 8-12

Materials:

- World Map
- 16 Grocery Bags (paper, plastic, and/or reusable)
- 16 Pie Chart Template – one for each group
- 16 Typical Family Photos – One for each group
<http://world.time.com/2013/09/20/hungry-planet-what-the-world-eats/>
- Country Data Chart – one for each student
- Country Comparison worksheet – one for each student
- Buying Food Around the World – one per class
- Country Information Cards or Internet Access
<http://www.marketplace.org/content/food-9-billion-map>



Minnesota Social Studies Standards and Benchmarks

- 8.2.3.4.1 Identify factors which affect economic growth and lead to a different standard of living in different countries.
- 8.3.1.2.1 Formulate questions about topics in geography; pose possible answers; use geospatial technology to analyze problems and make decisions with a spatial context.
- 8.3.3.6.1, 8.3.3.6.2, 8.3.3.6.3, 8.3.3.6.4, 8.3.3.6.5, 8.3.3.6.6, 8.3.3.6.7 Describe how the physical and environmental features of North America; Latin America; Europe and Russia; East Asia and Southeast Asia; South Asia and Central Asia; Southwest Asia; North Africa; and Africa south of the Sahara affect human activity and settlement.
- 9.3.2.4.4 Describe patterns of production and consumption of agricultural commodities that are traded among nations.
- 9.3.4.9.1 Analyze the interconnectedness of the environment and human activities (including the use of technology) and the impact of one upon the other.

Background

The cost and contents of a grocery bag differs widely around the globe. For American consumers, food is one of the best bargains available. There are several reasons why the American food system is one of the most efficient in the world. First, the U.S. contains 25% of the “Class 1” land or the best land in the world. Secondly, the climate is favorable and diverse for growing a large variety of commodities – fruits, vegetables, grains and other food staples that make up the bulk of the American diet. Third the U.S. has developed an infrastructure and support system that results in the production and distribution of more food at a low cost. That infrastructure begins with the development of new technologies and techniques that increase yields and reduce costs and environmental impacts on and off the farm. The infrastructure also provides safe storage facilities, food preservation, food transportation and supermarkets and other options for consumers to purchase high quality food at reasonable prices.

There is also an economic observation known as Engel’s Law: As people’s income goes up, the budget share for food goes down. This means that as income goes up, people have more money to spend on things other than food. At low income levels, people spend a high percentage of their money on food just to survive.

Countries that do not have abundant natural resources of soil and water, favorable climate, or access to modern agriculture equipment and methods, have difficulty producing food. This means that food must be imported from other countries. Additionally, almost all of the scientific improvements in agriculture production, processing and distribution have occurred in industrialized nations. In many developing countries, people farm much like

our ancestors did hundreds of years ago. This means that food is not as readily available; it may not be as high in quality or as dependable in consistency of supply.

This lesson asks students to compile information on the geographic features of a country as well as the percentage of income spent on food. Students will use this data to compare with other countries throughout the world and draw conclusions about the factors that influence food production and cost.

(From Food, Land and People Curriculum – Global Grocery Bags Lesson)

Procedure

1. As a class, have students brainstorm a list of things that families in the U.S. spend money on. Record the list in a visible place. Once the list is made, have students identify the main categories for spending (food, clothing, housing, recreation, entertainment, transportation, etc.)
2. Work as a class to prioritize the list, beginning with the category on which they think families spend the most money, down to the category that families spend the least money. Discuss the results.
3. Ask the students to imagine that their family's income was cut in half-which categories would their family spend its money on? How would your spending change? What would you live without?
 - Most students will identify food as something they can not live without – a high priority on their list. Some students may present ideas for decreasing the amount of money spent on food.
4. Ask students to imagine they lived in a different part of the world (select a specific continent, country, city, etc. if you would like). How would your priorities change in this different location? How would your spending habits change in this part of the world?
5. Tell students that as a class you will be analyzing how much money people spend on food in different parts of the world. They will be working with pie charts and percentages. Percent is a fraction of a whole number expressed in hundredths. For example:
 - 20% is 20 parts of 100
 - If you won 75% of your ball games, you won 75 out of 100 games.
 - If you spent 40 percent of your allowance on candy that would be 40 cents out of every dollar (100 cents).
6. Explain that graphs and charts can be used to show percentages. Pie charts, also known as circle graphs, are divided into parts (similar to a pie piece or pizza slice) to show percentages. If the circle was divided into 100 equal pieces, each piece would represent 1%. If the circle is divided into 50 equal pieces, each piece represents 2%. Tell students that you will be dividing them into groups. Each group will be responsible for gathering information on a different country and creating a pie chart illustrating the percentage of annual income that the average person living in their country spends on food.
7. Divide the class into 16 groups. Give each group a grocery bag. In the grocery bag should be: pie chart template, photo of a family from their country, country data chart, and country information card (If you are using computers with internet access, students will be looking up the information, so the country information card is not necessary). The following countries should be assigned to each group: *United States, United Kingdom, Canada, Australia, Kuwait, Italy, Japan,*

Ecuador, Mexico, India, Turkey, China, Egypt, Guatemala, Jordan, and Bosnia.

8. Instruct students to use the information in their bag to complete the first column in the Country Data Chart and also create a pie chart illustrating the percentage of annual income spent on food for a person living in their assigned country. If you would like students to do their own research using the internet, a good place to start is the interactive Food for 9 billion map at <http://www.marketplace.org/content/food-9-billion-map>
If you are not using the internet, the country data can be found on the attached Country Information Cards.
9. Share the information from the Buying Food around the World handout with your students. Instruct each group to find another group in their same category (A, B, C, D). The students must share data and record this in column 2 of their country Data sheet. Instruct the groups to compare the data and draw conclusions about what is similar between the two countries and explain why they have similar percentages of income spent on food. Record these observations on the Country Comparisons Worksheet (it might be helpful to copy this on the back of the Country Data Chart).
10. Inform students that they will be doing a three rotation “round robin” to gain information from one country that is in each of the other categories. For each rotation they need to repeat what they just did with a country from their category – gather data and complete the next column in the country Data Chart. Students must also compare and contrast this data and explain why the percentages are different for income spent on food. For example: if your country is in category A and you are meeting with a group from category D, compare the data to determine why citizens in your country spend a much lower percentage of income on food.
A suggested rotation is: Round 1 A meets with B and C meets with D
Round 2 A-C, B-D
Round 3 A-D, C-B
11. Lead a class discussion of the information that the class discovered. Some possible discussion prompters:
 - a. What observations can be made about the percentage of income spent on food and the hemisphere in which the country is located?
 - b. What are some reasons for differences between what people in category A spend on food compared with people in categories B, C, and D?
 - c. If you lived in a country other than the United States, what might you have to sacrifice in order to spend more money on food?
 - d. Why do you think the United States (or other country from category A) has one of the lowest percentages in the world? Why do you think Egypt (or other country from category D) has one of the highest percentages in the world?
 - e. Why do you think income spent on food differs so widely around the globe?

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651/201-6000. TTY users can call the Minnesota Relay Service at 711 or 1-800-627-3529. The MDA is an equal opportunity employer and provider.

Country Data Chart

Directions: Investigate your country by locating it on a world map and using the resources provided and suggested by your teacher to complete the chart below. Also create a pie chart illustrating the percentage of income spent on food by your country's average family.

| | Your Country | Country from same category | Round 1 – Country from category _____ | Round 2 – Country from category _____ | Round 3 – Country from category _____ |
|---|--------------|----------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Name of Country | | | | | |
| Hemisphere | | | | | |
| Arable (plowable) land in hectares per person | | | | | |
| Population | | | | | |
| Population growth | | | | | |
| Food consumption in Calories per day | | | | | |
| Water resources in cubic meters (m³) per person | | | | | |
| Percent of income spent on food | | | | | |
| Farm employment | | | | | |
| Interesting fact from information on map and/or card | | | | | |
| Observation from photo of a typical family | | | | | |

Name _____

Country Comparison

1. Compare your country's information with a country with a similar percentage of income spent on food (same category A, B, C, D). **What do the countries have in common?**

How could these similarities explain the similar percentages?

2. Round 1 – Country _____ Category _____
How is your country similar to this country?

Where are the largest differences?

Which factor do you think has the largest influence on the percentage of income spent on food?

3. Round 2 – Country _____ Category _____
How is your country similar to this country?

Where are the largest differences?

Which factor do you think has the largest influence on the percentage of income spent on food?

4. Round 3 – Country _____ Category _____
How is your country similar to this country?

Where are the largest differences?

Which factor do you think has the largest influence on the percentage of income spent on food?

Buying Food Around the World

Estimated expenditures on food as a percentage of total household income

Category A – 11% or less

United States 6.4%

United Kingdom 9.7%

Canada 9.8%

Australia 10.8 %

Category B – 11-20%

Kuwait 14.5%

Italy 14.9%

Japan 15.2%

Ecuador 19.0%

Category C – 20-30%

Turkey 22.3%

Mexico 22.5%

China 23.0%

India 29.5%

Category D – 30-41%

Bosnia 32.8%

Egypt 38.1%

Guatemala 38.1%

Jordan 40.7%

Information from Food for 9 Billion at <http://www.marketplace.org/content/food-9-billion-map>
International Programs (IP/CALS) at Cornell University and Homelands Productions

Country Information Cards

Canada

World's second largest country and one of leading exporters of wheat, meat and other commodities, Food insecurity much lower than USA, but immigrants and indigenous people still vulnerable. Among top 10 emitters of greenhouse gases per capita. Climate change expected to expand growing area and a length of season for some crops, but could reduce available water and allow new plant and livestock diseases.

Population: 34.1 Million

Population Growth: 1.1%

Food consumption: 3,532 calories/day

Income spent on Food: 9.8%

Arable land: 1.34 ha/person

Water Resources: 84,479 m³/person

Farm Employment: 2.4%

United States

World's biggest economy and leading exporter of wheat, corn, beef and many other commodities. Most unequal wealth distribution of all major developed countries. Economic woes have led one in seven Americans to rely on food assistance. Nearly 15% of households considered food insecure in 2010, compared to 12% in 1995. Hardest hit are inner cities and rural areas. Rapid changes in diet causing serious health problems, especially among poor. Three-fourths of Americans overweight, more than one-third obese, more than 8% diabetic.

Population: 309.1 million

Population Growth: 0.7%

Food Consumption: 3,748 Calories/day

Income spent on food: 6.4%

Arable Land: 0.53 ha/person

Water Resources: 9,179 m³/person

Farm Employment: 1.5%

Mexico

Middle-income country is world's largest producer of lemons, limes, onions, avocados, safflower seed and horse meat. Abundant resources but wealth is uneven and poverty remains high. Seventy-five percent of population lives in urban areas. Extremely high levels of pollution and deforestation, soil erosion and desertification. Center of origin of corn, with rich diversity and strong resistance to GMOS, but government easing restrictions.

Population: 113.4 million

Population Growth: 1.2%

Food Consumption: 3,266 Calories/day

Income Spent on Food: 22.4%

Arable Land: 0.22 ha/person

Water Resources: 3,651 m³/person

Farm Employment: 13.1%

Guatemala

Poor country with high rates of chronic malnutrition, especially among indigenous groups. Slash-and-burn agriculture and illegal logging contribute to deforestation and soil erosion. Frequent hurricanes and tropical storms destroy crops and infrastructure.

Population: 14.4 million

Population Growth: 2.5%

Food Consumption: 2,159 Calories/day

Income Spent on Food: 38.1%

Arable land: 0.11 ha/person

Water Resources: 7,781 m³/person

Farm Employment: No data

Ecuador

Rich in biodiversity and resources, including oil, which accounts for more than half of export earnings. World's fourth largest banana producer. Oil contamination in sensitive areas such as Galapagos and Amazon Basin. Soil erosion, deforestation and desertification also are concerns. Frequent earthquakes, volcanic activity, floods and occasional droughts. High poverty, especially among indigenous peoples.

Population: 14.5 million

Population Growth: 1.4%

Food Consumption: 2,301 Calories/day

Income Spent on Food: 19.0%

Arable Land: 0.08 ha/person

Water Resources: 30,291 m³/person

Farm Employment: 28.7%

Egypt

Mostly desert with 97% of population in Nile Valley and Delta. Only 3% of territory is arable but land is among the most productive in the world. World's largest importer of wheat exports fruit, vegetables, cotton. Population pressure, soil erosion, desertification, salinization and pollution are threats as is the probability of rising sea levels in coming years. Long-running conflict over Nile water with upstream countries.

Population: 81.1 million

Population Growth: 1.7%

Food Consumption: 3,195 Calories/day

Income Spent on Food: 38.1%

Arable land: 0.04 ha/person

Water Resources: 23 m³/person

Farm Employment: 31.6%

Kuwait

Hot desert country with limited fresh water and little potential for farming. Produces fish and shrimp. Oil makes up half of GDP and 95% of exports and government revenue.

Population: 2.7 million

Population Growth: 3.4%

Food Consumption: 3,064 Calories/day

Income Spent on Food: 14.5%

Arable Land: 0.00 ha/person

Water Resources: No Data

Farm Employment: No Data

Jordan

Mostly desert country imports three times as much food as it exports. Suffers chronic water shortages. Scarce agricultural land under severe pressure from high population growth, overuse of groundwater, overgrazing, deforestation and pollution.

Population: 6.0 million

Population Growth: 2.2%

Food Consumption: 3,015 Calories/day

Income Spent on Food: 40.7%

Arable Land: 0.03 ha/person

Water Resources: 115 m³/person

Farm Employment: No data

Turkey

Fast-growing economy turning away from agriculture toward manufacturing and services. Seventy percent of population now lives in cities. Poverty and food insecurity remain high in rural areas where large families with small land holdings contend with soil erosion, overgrazing and lack of infrastructure.

Population: 72.8 million

Population Growth: 1.3%

Food Consumption: 3,517 Calories/day

Income Spent on Food: 22.3%

Arable Land: 0.30 ha/person

Water Resources: 3,160 m³/person

Farm Employment: 23.7%

Italy

Wealthy and well-fed but struggling with debt and economic slowdown. Among leading producers of many vegetables, fruits and nuts. Aging population and low birth rate are concerns, particularly in rural areas. Home to World Food Programme (WFP), Food and Agriculture Organization (FAO) and International Fund for Agricultural Development (IFAD), as well as to Slow Food Movement, which advocates for non-industrial production.

Population: 46.1 million

Population Growth: 0.4%

Food Consumption: 3,272 Calories/day

Income Spent on Food: 13.2%

Arable Land: 0.27 ha/person

Water Resources: 2,422 m³/person

Farm Employment: 4.0%

United Kingdom

Wealthy, food secure country. Intensive, highly mechanized agriculture provides 60% of food needs with less than 2% of the labor force. Strong environmental and organic farming movements along with growing government support for environmental safeguards. Opposes France's support for domestic farm subsidies; officially favors free trade. Greenhouse gas emissions considerably lower than other industrial countries.

Population: 62.2 million

Population Growth: 0.7%

Food Consumption: 3,458 Calories/day

Income Spent on Food: 9.7%

Arable Land: 0.10 ha/person

Water Resources: 2,436 m³/person

Farm Employment: 1.5%

Australia

Vast country with population concentrated in coastal cities. Large farms among most efficient in the world. Extremely variable rainfall patterns, highly prone to drought. One of world's leading per capita emitters of greenhouse gases. Climate change expected to drive up temperatures in west and interior, where limited water supplies already make farming difficult. Wheat yields could drop by one-third. Government estimates 40 million non-Australians rely on agricultural output for food security.

Population: 22.3 million

Population Growth: 1.7%

Food Consumption: 3,227 Calories/day

Income Spent on Food: 10.8%

Arable Land: 2.15 ha/person

Water Resources: 22,413 m³/person

Farm Employment: 3.3%

China

Contains one-fifth of world's population and one-tenth of its arable land. Extremely rapid economic growth concentrated mainly in urban areas. Trending toward less poverty and malnutrition but increasingly challenged to produce sufficient food. Outsourcing cereal and soy production to Africa and South America. Facing serious water shortages in highly populated northern plain, traditionally country's breadbasket. Increasing numbers of livestock straining fragile pasture land.

Population: 1,338.3 million

Population Growth: 0.5%

Food Consumption: 2,981 Calories/day

Income Spent on Food: 23.0%

Arable land: 0.08 ha/person

Water Resources: 2,113 m³/person

Farm Employment: 39.6%

India

Despite dramatic economic growth, world's most second populous country remains home to more hungry people than any other nation. More than half of labor force works in agriculture but productivity is low. Population strains all social and environmental systems. Concerns include water shortages, soil erosion, salinization, desertification, drought, seasonal flooding, and air and water pollution. Long term challenges include infrastructure, education and growing demand for meat and dairy.

Population: 1,170.9 million

Population Growth: 1.3%

Food Consumption: 2,352 Calories/day

Income Spent on Food: 29.5%

Arable Land: 0.14 ha/person

Water Resources: 1,252 m³/person

Farm Employment: No Data

Bosnia and Herzegovina

Poor soils make growing crops difficult. Most farming is livestock, much of it on subsistence level. Agricultural development hindered by poor infrastructure, lack of access to support services and finance, and inadequate links to processing industries and markets.

Population: 3.8 million

Population Growth: -0.2%

Food Consumption: 3,078 Calories/day

Income Spent on Food: 32.8%

Arable land: 0.26 ha/person

Water resources: 9,422 m³/person

Farm Data: No Data

Japan

Mountainous, densely populated country relies on imports for 60% of caloric intake. Small, highly subsidized agriculture sector with some of the highest yields in the world. Fishery accounts for 15% of global fish catch. Threatened by frequent and sometimes severe earthquakes, tsunamis, typhoons and volcanic activity.

Population: 127.5 million

Population Growth: -0.1%

Food Consumption: 2,812 Calories/day

Income Spent on Food: 15.2%

Arable Land: 0.03 ha/person

Water Resources: 3,371 m³/person

Farm Employment: 4.2%

Pie Chart Template
Each Division = 2%

Country _____

Estimated expenditure on food as a percentage of total household income

