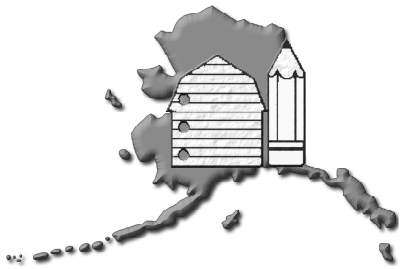
Affordability of Food

Materials
- Calculators (if appropriate)
- scrap paper
- worksheet/quiz (included)
- American Farm Bureau Farm Facts (pdf online)

Objectives
Practice calculating percentages, percentage change, differences and learning to apply currency exchange rates while gleaning information on the value of American agriculture to US economy and its benefits to all Americans.

Suggested grade levels
7-9

Alaska Content Standards
Math A1, B3, E1-2
Science D1,2,4



This project presented by Alaska Agriculture in the Classroom through funding from the Agriculture in the Classroom Consortium and the USDA. For more information, visit www.agclassroom.org/ak or www.agclassroom.org

Preparation
Students should understand how to calculate percentages, percent change and multiply by factors.

Introduction
Americans, including Alaskans, are used to finding full stores shelves with reasonably priced foods. Although Alaskans, especially those in rural and Bush areas, pay higher prices for food than many other Americans, we still benefit from a plentiful and low-cost food supply.

Affordability
What does affordability mean? It refers to whether a person (or group of people) can reasonably find the means to pay for something. In America, most people have the means to afford food. The average American spends about 7 percent of his or her total income on food, or about 10 percent of his or her disposable income (source: American Farm Bureau). That means in America, food is very affordable for most people. In other countries of the world, that isn't always the case.

According to statistics from the United Nations, even people in high-income nations like Australia, Great Britain and Japan spend about 20 percent of their disposable income on food. In India, the average is 50 percent. Some underdeveloped countries have even higher percentages of income spent on food.

The American Advantage
Why do Americans spend less than virtually any other nationality on food? Because of the quantity, diversity and quality of food grown in the United States. Each American farmer produces enough food to feed more than 120 people. That means food for exporting as well as food for Americans. That number has risen sharply over the last 50 years, thanks to improve farming techniques; better seed, breeding stock and fertilizers; and technology, including biotechnology, global satellite imaging and research.

Calculating the Costs
Using information available from online or printed sources, we will calculate how much food will cost in various countries, in their currency.

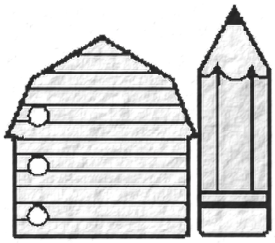
Example: If a Norwegian (a person from Norway) dockworker must spend 16 percent of his wages on food, and he earns 180,000 kroners, how many kroners does he spend each year on food? If the exchange rate between the dollars and kroners is 6.24 kroners for each US dollar, how much does he make in US dollars and how many dollars would he spend on food?
28,800 kroners on food; earns about $28,860 and spends $4,618 on food.

Websites
(If the following web links are outdated, use a search engine to find similar sites.)

www.fb.org (follow links to Farm Facts)
www.x-rates.com/calculator.html (exchange rates)
http://www.kidscanmakeadifference.org/hunfa.htm

Terms to Define

Income
Disposable income
Average
Biotechnology
Global Satellite Imaging
Affordability
Exchange rate



This project presented by Alaska Agriculture in the Classroom through funding from the Agriculture in the Classroom Consortium and the USDA. For more information, visit www.agclassroom.org/ak or www.agclassroom.org

This lesson developed by Victoria Naegele, executive director, Alaska Ag in the Classroom.

Calculating the Cost of Foods (with answers)

1. Pilar shops for her family near her home in Guadalajara, Mexico. Her family income is 136,000 pesos per year. If she must spend 33 percent of her family's income on food, how many pesos must she spend on food each month on average? How much would that be in US dollars if the exchange rate is 11.37 Mexican pesos for each $1?
3,740 pesos per month; about $329.

2. Tibold works at a shop near Frankfurt, Germany, and earns just 17,000 Euros a year. He spends 14 percent less than the national average of 21 percent on food because he has a small garden. How many Euros does Tibold spend on food each year? What would he spend on average if he didn't plant a garden? ***3,060 euros; 3,570 euros***

3. If the average family in India must spend 51 percent of its income on food, and the average household income is 300,000 rupee, how much money does the Indian family have to spend on housing, clothing, fuel and other essential and nonessential items? If the exchange rate is 45 Indian rupees for each US dollar, what is the Indian family's average weekly food cost in dollars? ***147,000 rupees annually; $65.38***

4. Ai is an office worker near Takasago, Japan. She and her husband, a bus driver, earn a total income of 524, 540 yen each year. If the average percentage of Japanese income spent on food is 26 percent, and Ai and her husband reflect this average, how much does she spent each year on food? If their food bill increases to 157,000 yen, what percent of their income would the couple then be paying for food? What is the difference in food cost in US dollars between the cost in yen at 26 percent and the cost at the higher percentage if the exchange rate is 103 Japanese Yen for each US dollar? **136,380 yen**;***30 percent; $200.19***

5. Judy is a teacher who lives in the Alaska Interior. She earns $48,000 a year. If she spends the national average of her total income on food, how much will she spend? How much more or her income would she have to spend (in US dollars) if she lived in Italy? In South Africa? ***$3,360; $4,800; 13 percent more or $6,240 in Italy; 18 percent more or $8,640 in South Africa.***

6. Carlos moves from Mexico to Spain to take a better job. In Mexico he spent 33 percent of his 150,000 peso income on food. In Spain he will spend 25 percent of his 35,000 euro income on food. Compare Carlos' food budget in each country by converting his Mexican food budget to euros or his Spanish food budget to pesos. About what percentage change will he see in the amount of money he is spending on food? Use the following to calculate the difference:Euros to Pesos: .069 euros per peso; 14.48 pesos per euro
Increase of 5,334.50 euros or 77,200 Mexican pesos for a 64-percent increase.

Discussion points

• Carlos' food bill has increased dramatically but he is spending a smaller percentage of his new income on food. How might the additional money spent on food affect his diet?

• What factors determine the cost for food in a different country or region? Why is food in Alaska sometimes more expensive than in the Contiguous 48 States? Why is food more costly in the Bush? (Factors include transportation, labor costs, loss, availability.)

• How do global satellite images and improved weather forecast information aid farmers?

• How is technology changing what you eat?

• Despite the low cost of food in America, a 1995 study estimates that 20 to 30 million Americans are too poor to buy enough food to live healthy, productive lives. Why?

Name _____

Calculating the Cost of Food

1. Pilar shops for her family near her home in Guadalajara, Mexico. Her family income is 136,000 pesos per year.

(A) If she must spend 33 percent of her family's income on food, how many pesos must she spend on food each month on average?

(B) How much would that be in US dollars if the exchange rate is 11.37 Mexican pesos for each $1?

2. Tibold works at a shop near Frankfurt, Germany, and earns just 17,000 Euros a year.

(A) How many Euros does Tibold spend on food each year?

(B) What would he spend on average if he didn't plant a garden?

3. (A) If the average family in India must spend 51 percent of its income on food, and the average household income is 300,000 rupee, how much money does the Indian family have to spend on housing, clothing, fuel and other essential and nonessential items?

(B) If the exchange rate is 45 Indian rupees for each US dollar, what is the Indian family's average weekly food cost in dollars?

4. Ai is an office worker near Takasago, Japan. She and her husband, a bus driver, earn a total income of 524, 540 yen each year.

(A) If the average percentage of Japanese income spent on food is 26 percent, and Ai and her husband reflect this average, how much does she spent each year on food?

(B) If their food bill increases to 157,000 yen, what percent of their income would the couple then be paying for food?

(C) What is the difference in food cost in US dollars between the cost in yen at 26 percent and the cost at the higher percentage if the exchange rate is 103 Japanese Yen for each US dollar?

Calculating the Cost of Food Pg. 2

Name _____

5. Judy is a secretary who lives in the Alaska Interior. She earns $48,000 a year.

(A) If she spends the national average (7 percent) of her total income on food, how much will she spend?

(B) How much more of her income would she have to spend (in US dollars) if she lived in Italy?

(C) In South Africa?

Reminder: Italy's average income percent spent on food is 23 percent; South Africa's is 28 percent.

6. Carlos moves from Mexico to Spain to take a better job. In Mexico he spent 33 percent of his 150,000 peso income on food. In Spain he will spend 25 percent of his 35,000 euro income on food. Compare Carlos' food budget in each country by converting his Mexican food budget to euros or his Spanish food budget to pesos.

(A) About what percentage change will he see in the amount of money he is spending on food? Use the following exchange rates to calculate the difference:
Euros to Pesos: 14.48 euros per peso
Pesos to Euros: .069 peso per euro

Show your work