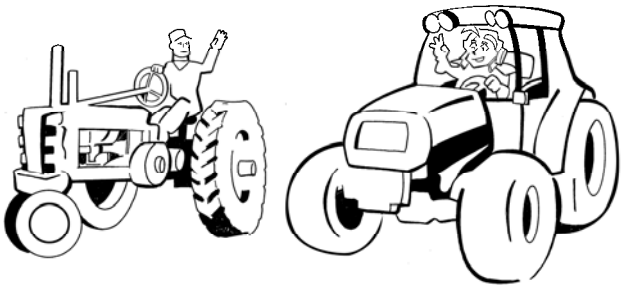
GRADES 3 & 4—AGRICULTURE THEN (1930s) & NOW (2000s)

NATIONAL SOCIAL SCIENCE STANDARDS

- Growth: Workers can improve their productivity by using physical capitol such as tools and machinery.
- US History: Understand the history of the local community and how communities in North America varied long ago.



OBJECTIVES

The student will:

1. identify the time line from the 1930's- 2000.
2. identify the advance in equipment used for farming.
3. compare and contrast the productivity of a farmer between then and now.

BACKGROUND

Agriculture has been the world's largest industry for thousands of years. Even in the last 70 years, the lifespan of many of our grandparents, agriculture has changed dramatically.

Seventy years ago, farmers didn't have many machines to help them grow food, and nearly everything was done by hand. It required a lot of work by people to produce enough food to feed everyone. The basic tools of farming are continually being improved upon, resulting in more efficient use of labor.

FAST FACTS

TODAY, TRACTORS PULL LOADS THAT 100 HORSES COULD NOT PULL.

COMBINES HARVEST AND SEPARATE THE GRAIN.

A COMBINE CAN CLEAN 5 ACRES OF WHEAT IN 1 HOUR, A JOB THAT USED TO TAKE 12 WORKERS A WHOLE DAY.

IN 1930, 1 FARMER FED 10 PEOPLE; TODAY 1 FARMER FEEDS 130 PEOPLE.

In the 1900s, farmers used animal power to pull tools such as plows and seed drills. Engine powered tractors replaced animal power. The tractors of today pull loads that 100 horses could not pull. Plows developed from being able to plow one row at a time to multiple rows at a time.

A combine (kŏm´bīn) that harvests and separates the grain can clean 5 acres (one acre is the size of a football field) of wheat in one hour, a job that used to take 12 workers a whole day.

As farm machines sped up the process of planting and harvesting, fewer people were needed for farm work. Many farmers started branching out into industrial trades and crafts for the manufacture of consumer goods.

In 1930 it took the work of 1 farmer to feed 10 people. Today, 1 farmer feeds 130 people. In 1930 it took 15-20 hours of labor to produce 100 bushels of corn; today, 2.75 hours of labor produces the same amount.

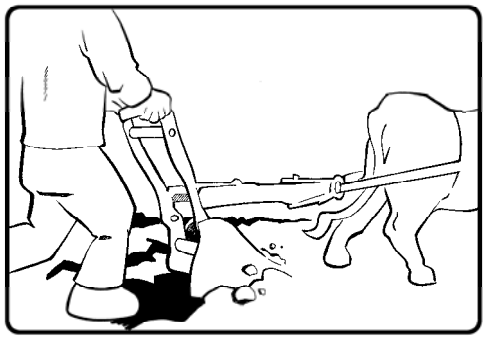
AGRICULTURE THEN & NOW (CONTINUED)

INSTRUCTIONAL PROCEDURE

1. Review background information.

2. Review the concept of a timeline.

3. Have the students complete the "Agriculture Than and Now" activities.



ASSESSMENT

1. Give students copies of Activity 3, Agricultural Facts.

2. In a paragraph form, have the students compare and contrast farming then and now.

WORD POWER

combine *n.* A harvesting machine that heads, threshes and cleans grain while moving over a field.

plow *n.* A tool used to cut, lift and turn over the soil.

productivity *n.* The amount of product that can be made by one man in a specific time period.

timeline *n.* A table listed important events for successive years within a particular time period.

tractor *n.* A four-wheeled vehicle used to pull farm equipment.

technology *n.* The practical use of science to make life better and easier for people.

AGRICULTURAL TIMELINE

Decade	Agricultural Changes	1 Farmer Feeds
Early 1800	Hand tools and plows	4
1870	Horse drawn steel plow, reaper, and threshing machine developed	5
1910	Engine powered tractor developed	
1920	Chemical revolution in all areas ▪ Pesticides developed	
1930	Rubber tire tractor developed	10
1940	Change from horse drawn equipment to tractor drawn begins	
1950	Tractors outnumber horses and mules ▪ Role of soil nutrients is recognized ▪ Crop rotation begins	16
1960	Self-propelled combine introduced ▪ Critical link of beneficial insects to the food chain discovered	26
1970	New fertilizers and Pesticides to feed and protect plants ▪ IPM concept developed	47
1980	Biotechnology field trials begin ▪ Softer pesticides-less harmful to beneficial insects and environment ▪ Low rate material 1 ounce/acre rather than 2 pounds	76
1990	Biotech corn, soybeans, and cotton are approved for sale ▪ Computers ▪ Global Positioning Satellites ▪ IPM utilized	133
2005	Advancements in biotechnology	144

STATISTICAL AGRICULTURAL FACTS

Then (1930s)	Now (2000s)
55% of the population are farmers	2% of the population are farmers
1 acre produces 30 bushel of corn	1 acre produces 120 bushels of corn
1 farmer feeds 10 people	1 farmer feeds 130 people
15-20 hours of labor produces 100 bushels of corn	2.75 hours of labor produces 100 bushels of corn
Average life expectancy is 47 years	Average life expectancy is 76.1 years

NAME_____

ACTIVITY 1: AGRICULTURE THEN (1930s) AND NOW (2000s)

FACTS

In 1930, 55% (more than half) of the population was farmers.

Convert 55% to fraction_____

In 2000, 2% of the population was farmers.

Convert 2% to fraction_____

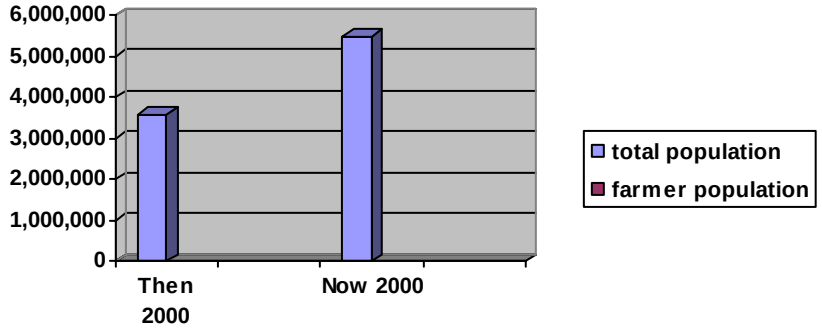
THE MISSOURI CONNECTION

Year	Missouri Population (approximate)
1930	3,600,000 people
2000	5,500,000 people

Year	Percent of farmers in population	Total population in Missouri	Farmer Population in Missouri
1930	55%	3,600,000	1,980,000
2000	2%	5,500,000	110,000

GRAPHING MISSOURI NUMBERS

The total population of then and now is already graphed. Place a red bar on the graph to indicate the **farmer population** for each year.



QUESTIONS

Circle the choice that correctly fills in each sentence.

1. The population of Missouri has (increased/decreased) between 1930 and 2000.

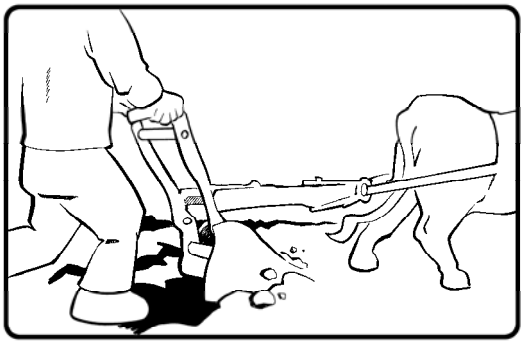
2. The number of farmers in Missouri has (increased/decreased) between 1930 and 2000.

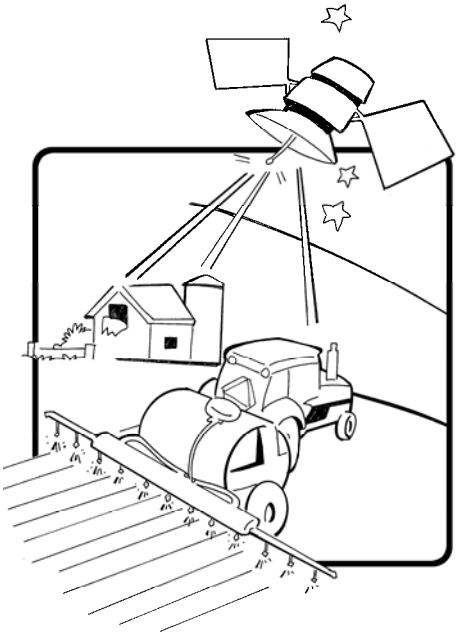
DISCUSSION

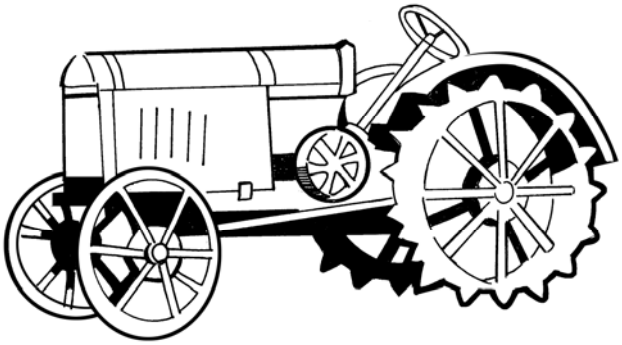
In the past 70 years the number of farmers has decreased but the population has increased. What has changed to help the farmer meet the demand for food?

NAME_____

ACTIVITY 2 — AGRICULTURE THEN (1930s) AND NOW (2000s)







NAME_____

ACTIVITY 2 — AGRICULTURE THEN AND NOW

TIMELINES

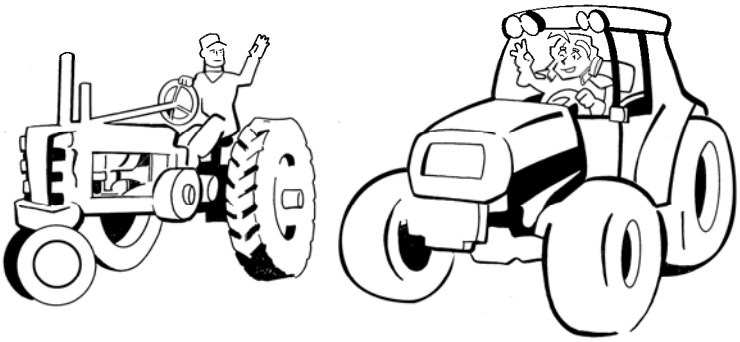
TIMELINE	AGRICULTURAL CHANGES	PASTE CORRECT PICTURE IN THE PROPER RANGE IN THIS COLUMN
1900 and before	▪ Animal pulled plows and equipment	
1910	▪ Average farm size: 147 acres ▪ Engine powered tractors introduced (metal wheels)	
1930	▪ Rubber tire tractor introduced ▪ 1/3 farms have electricity	
1940	▪ Average farm size: 175 acres ▪ Change from horse pulled equipment to tractor pulled equipment begins	
1950	▪ Average farm size: 216 acres ▪ Rural Electrification: Most all farms have electricity ▪ Number of tractors exceeds the number of horses and mules	
1960	▪ Self-propelled combines introduced	
1970	▪ Sugar beets and cotton harvested mechanically, no hand labor used	
1980	▪ Average farm Size 460 acres ▪ Improved farming methods such as no-till and sustainable farming	
1990/2000	▪ Global Positioning Satellites	

NAME_____

ACTIVITY 3 — AGRICULTURE THEN AND NOW

COMPARE—CONTRAST

In paragraph form, compare and contrast farming then and now.



THEN (1930s)	NOW (2000s)
• 55% of the population are farmers	• 2% of the population are farmers
• 1 acre produces 30 bushels of corn	• 1 acre produces 120 bushels of corn
• 1 farmer feeds 10 people	• 1 farmer feeds 144 people
• 15-20 hours of labor to produce 100 bushels of corn	• 2.75 hours of labor to produce 100 bushels of corn

GRADES 4 & 5— ECONOMICS OF AGRICULTURE

NATIONAL SOCIAL SCIENCE STANDARD

- Economics: Markets-Price and quantity determination

OBJECTIVES

The student will:

1. understand the law of supply in relation to low US food costs.
2. identify the use of technology in agriculture as the reason for adequate low cost food supply.
3. understand low food costs benefits the economy.

WORD POWER

demand *n.* The amount of a resource that people are willing to purchase.

supply *n.* The amount of a resource available to consumers.

BACKGROUND

Technology in agriculture has allowed for an abundant food supply in the US. Increased yields are the result of using modern farm equipment, pesticides, biotechnology, and farming applications with the global positioning satellites. One of the principles of economics is the law of supply and demand. Supply and demand determines the cost of everything you buy.

Because the US has an adequate supply of food for our population, the cost is very low. If there were a limited supply of food and the demand remained the same, the cost of food would be higher.

INSTRUCTIONAL PROCEDURE

1. Review background information.

2. Have students complete Activity 1 “Agricultural Abundance” and Activity 2 “Grocery Costs.”

ASSESSMENT

Have the student explain what would happen in the following scenario:

A Midwestern drought caused a decrease in corn and soybean production. What would be the effect on you? How would a drought resistant corn or soybean plant developed with biotechnology change the situation?

NAME_____

ACTIVITY 1 — AGRICULTURAL ABUNDANCE

CORN AND SOYBEAN HUNT

Corn and soybeans are grown for food, human medicine, cloth, and much more.

Send half of the students on a "corn hunt" and half the students on a "soybean hunt" either at home or at a local supermarket. Have them check ingredient labels to find products that contain some form of corn or soybean.

Divide the products into two lists, one that includes foods that are primarily made form corn/soybean and those which have corn/soybean-based additives such as corn syrup, dextrose or cornstarch. Circle the crop for which you are hunting.

FOODS MADE FROM CORN/SOYBEAN	FOODS WITH CORN/SOYBEAN ADDITIVES
examples: corn tortillas, corn chex, hominy	examples: ketchup, pudding, soft drinks

NAME_____

ACTIVITY 2 — GROCERY COSTS

TYPICAL BAG OF GROCERIES

- 1 GALLON OF MILK
- 12 EGGS
- 5 POUNDS OF SUGAR
- 1 POUND OF CHEESE
- 1 POUND OF SIRLOIN STEAK
- 2 POUNDS OF APPLES

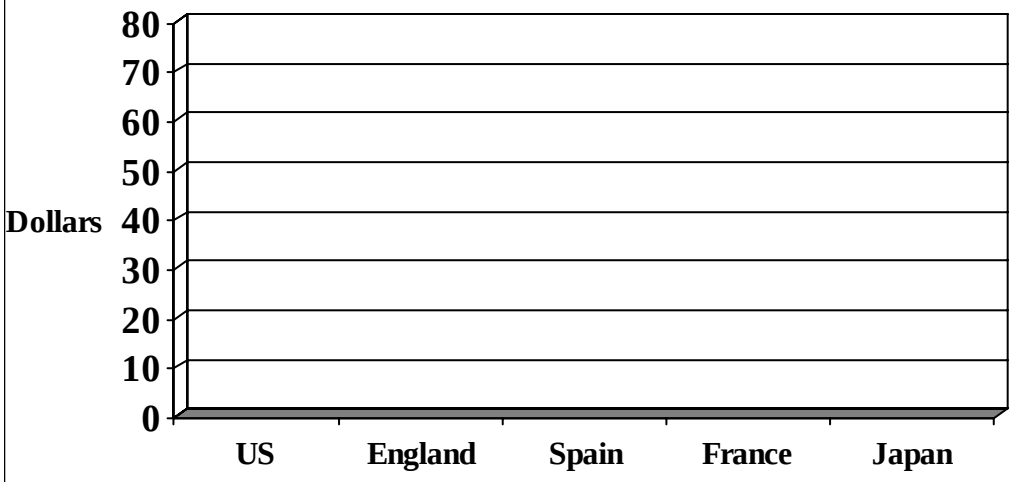
COMPARATIVE SHOPPING

Groceries cost different amounts around the world.

Graph the costs of these groceries for each of the following countries:

- United States: $19.00
- England: $24.00
- Spain: $29.00
- France: $31.00
- Japan: $75.00

GROCERY COSTS



GRADES 4 & 5— A SLICE OF SOIL*

NATIONAL SOCIAL SCIENCE STANDARD

- Physical Systems: Understand the physical processes that shape the patterns of Earth's surface.

OBJECTIVES

The student will:

1. identify the amount of the earth's surface available for food production.
2. identify characteristics of the earth's surface that are not conducive to food production.

WORD POWER

natural resource *n*. A material found in nature that is necessary or useful to people such as plants, animals, the weather, etc.

BACKGROUND

One of the most natural resources on the earth's surface is soil. Many living things depend on it as a source of food, either directly or indirectly.

Our food producing land remains the same and yet the world population continues to grow. Consequently, each person's food portion becomes smaller and smaller. It is the responsibility of each generation to use the soil wisely to insure the future. You can conduct the following demonstration to show how little of the earth's surface is actually used for food production as compared to growing populations.

INSTRUCTIONAL PROCEDURE

1. Inform the students that the apple in Activity 1 represents the earth.

2. Conduct Activity 1.

3. Have students complete Activity 2.

ASSESSMENT

Review activity 2.

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NAME_____

ACTIVITY 1 — A SLICE OF SOIL

SUPPLIES

- LARGE APPLE (SOFTER APPLES WORK BETTER)
- PARING KNIFE (OR HEAVY PLASTIC KNIFE)

INSTRUCTIONS

1. Cut the apple into four parts. Three parts represent the oceans of the world. The fourth part represents the land area.
2. Cut the land section in half lengthwise. Now you have two 1/8th pieces. One section represents land such as deserts, swamps, Antarctic, artic and mountain regions. The other 1/8th section represents land where man can live and may be able to grow food.
3. Slice this 1/8th section crosswise into four equal parts. Three of these 1/32nd sections represent the areas of the world which are too rocky, too wet, too hot, or where soils are too poor for production, as well as areas developed by man.
4. Carefully peel the last 1/32nd section. This small bit of peeling represents the soil of our earth on which mankind depends for food production.

NAME_____

ACTIVITY 2 — NATURAL RESOURCES

PROVE YOUR POINT

Supporting details are the facts and information that explain or give examples of the main idea.

Read each main idea and the sentences that follow it. Write an X before each sentence that gives supporting details.

1. The amount of soil on the earth to grow food is limited.
____Most of the earth is covered in water.
____Deserts are too dry to grow food.
____Some areas of earth are too rocky, too wet or too hot to grow food.
____The earth has seven continents.

2. The Antarctic and artic are not good places to grow crops.
____The temperatures are very cold.
____The sunlight is limited.
____The Antarctic and Artic are on opposite poles of the earth.
____People are unable to live in the artic and Antarctic.

3. Developed urban areas (city) are not used for crop productions.
____A city has limited amount of open land area.
____A city has a dense population of people.
____Urban areas are dispersed around the United States.

THINK FOR YOURSELF

Think of another main idea about amount natural resources in relation to growing food?
Write the main idea with three supporting details.

GRADES 5—6: FOOD FOR ALL

NATIONAL SOCIAL SCIENCE STANDARD

- World History: Major global trends since WWII

NATIONAL SCIENCE STANDARD

- Personal and Social Perspectives: Populations, resources and environments.

OBJECTIVE

The student will relate cause and effect to agriculture.

BACKGROUND

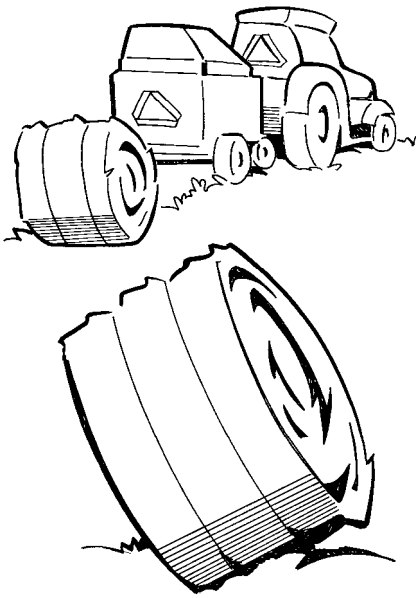
The global population is growing at a very fast rate. Since 1950 the global population has tripled. Scientists estimate that the earth's population will reach 10 billion before the year 2050.

Most of this growth is taking place in underdeveloped countries. The Slice of Soil lesson (grade 4/5) addresses that the earth has a limited amount of surface area covered with soil to grow food. With a growing global population (cause) farmers are challenged with growing more food on less land (effect). Farmers need to protect their crops and increase their crop yields

FAST FACT

SINCE 1950 THE GLOBAL POPULATION HAS TRIPLED.

SCIENTISTS ESTIMATE THAT WE WILL REACH 10 BILLION BEFORE THE YEAR 2050.



INSTRUCTIONAL PROCEDURE

1. Review background material and Slice of Soil (grade 4/5) lesson.
2. Discuss the concept of cause and effect.
3. In groups of two have the students do Activity 1.
4. Discuss their responses.
5. Discuss the need for ways for farmers to protect their crops from damage from weather, weeds and insects.

WORD POWER

cause *n.* The event that makes something happen.

effect *n.* The thing that happens, or the outcome.

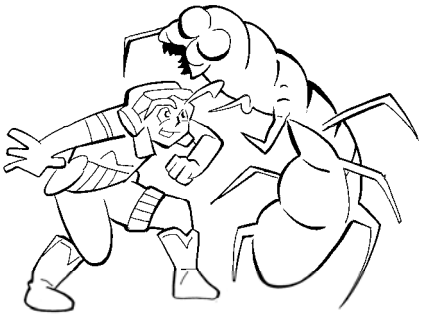
ASSESSMENT

Have the student explain what would happen in the following scenario:

A Midwestern drought caused a decrease in corn and soybean production. What would be the effect on you? How would a drought resistant corn or soybean plant developed with biotechnology change the situation?

NAME_____

ACTIVITY 1 — CAUSE & EFFECT IN AGRICULTURE



CAUSE / EFFECT

For each cause write a possible effect (outcome).

1. It was a very hot and dry summer for the farmer's crops.

_____

2. The heavy spring rains caused the farmer to plant the seeds very late in the season.

_____

3. The weeds in the cornfields grew very tall so the corn plant did not get enough sun or air.

_____

4. One-half of a farmer's crop of wheat is eaten by bugs.

_____

5. Unused plant material from a crop is left to decay (composted) and mixed in with the soil.

_____

6. The world population tripled since 1950, but due to land development the amount of land to grow food on has decreased.

_____