

## GRADE 3-4 WHAT IS AGRICULTURE?

### Activity 1

- A. Crop Examples: wheat, corn, cotton, soybeans, vegetables  
Livestock Examples: cows, pigs, chickens  
Dairy: Dairy cows
- B. timber....paper  
dairy cow.....cheese  
cotton.....blue jeans  
wheat.....spaghetti  
flower.....perfume

### Activity 2

1. farm
2. farmer
3. crops
4. livestock
5. agriculture
6. dairy

## GRADE 4-5 FARMING CYCLE

### Activity 2

- 6 Soon, the seeds start to sprout
- 5 Next, the farmer plants the corn seeds
- 1 First, the farmer plans what crop he will plant for the year
- 8 After summer arrives, the corn grows to 6 feet tall
- 7 The season changes to summer with long days and warm to hot temperatures
- 9 Finally, the temperature is cool and the days are shorter
- 2 Next the farmer purchases the corn seeds
- 10 So the corn is ready to harvest (pick)
- 3 Spring arrives and the temperatures begins to warm up
- 4 So the farmer can till his field

## GRADE 3-4 THEN AND NOW

### Activity 1

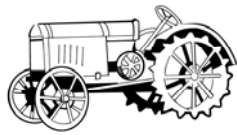
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The population of Missouri has increased between 1930 and 2000.

The number of farmers in Missouri has decreased between 1930 and 2000.

Discussion: Technology including machinery and computers.

### Activity 2



## GRADE 4-5 A SLICE OF SOIL

### Activity 2

1. The amount of soil on the earth to grow food is limited.

- X Most of the earth is covered in water.
- X Deserts are too dry to grow food.
- X Some areas of earth are too rocky, too wet or too hot to grow food.  
The earth has seven continents.

2. The Antarctic and arctic are not good places to grow crops.

- X The temperatures are very cold.
- X The sunlight is limited.  
The Antarctic and Arctic are on opposite poles of the earth.
- X People are unable to live in the arctic and Antarctic.

3. Developed urban areas (city) are not used for crop productions.

- X A city has limited amount of open land area.
- X A city has a dense population of people.  
Urban areas are dispersed around the United States.

## GRADE 5-6 FOOD FOR ALL

### Activity 1

1. The farmer's crop had a very low yield (amount of food grown).
2. The harvest (picking time) was delayed.
3. The corn growth was stunted.
4. The farmer made less profit. Food prices were higher because of less supply.
5. Nutrients are put back into the soil.
6. Farmers have to find ways to grow more food on less land.



# ANSWER KEY TECHNOLOGY UNIT

## GRADE 3-4 WHAT'S IN A FIELD?

### Activity 1

1. Yes; 2. b; 3. b and c; 4. sunlight

## GRADE 4-5 TECHNOLOGY OF AGRICULTURE

1. more, less; 2. environment; 3. feed

1. mechanical; 2. global positioning satellite; 3. biotechnology; 4. pesticides

Reasons food costs are the lowest in the world:

- technology requires less human labor; ·crop protection products prevent crop loss resulting in higher yields
- science such as biotechnology can develop plants with beneficial traits; ·technology allows farmers to grow more food on less land

### Activity 2

Early plows: horse pulled, one blade, wooden, slower, labor intensive

Modern plows: Engine-powered, multiple blades can prepare multiple rows at once, rotating blades, quicker

## GRADE 4-5 CROP PROTECTION?

### Activity 1

1.  $\$10 \times 5 = \$50$ ; 2.  $\$700 \times 5 = \$3500$ ; 3.  $\$30 \times 5 = \$150$ ;  
4. Higher food costs. Less money to spend on other needs.

### Activity 2

A 1. benefit; 2. risk; 3. benefit; 4. benefit; 5. benefit; 6. benefit; 7. risk  
B 1. true; 2. true; 3. false; 4. false; 5. false

## Grade 5-6 Abilities of Technology in Ag

### Activity 1

C—Biotechnology can develop plants that are not destroyed by insects.

F—Biotechnology can develop plants that grow without much water.

B—Biotechnology can provide rice high in beta-carotene to prevent vitamin A deficiency.

E—Biotechnology has developed new cooking oils higher in vitamin E.

A—GPS field monitoring can determine the crop yield.

D—GPS can guide a combine around a field to harvest without the need for a driver.



# ANSWER KEY ENVIRONMENT UNIT

## GRADE 3-4 FARMERS AND LAND: A PARTNERSHIP

### Activity 1

- A. S Cover the field with a plant that will add nutrients back to the soil and prevent weeds from growing when a field is not being used for food crops.  
N Let the weeds grow and kill them with a chemical when it is time to plant a crop.
- B. N Turning the soil to get rid of weeds can cause soil to wash into the water source.  
S Use the correct amount of chemical to prevent weed growth to avoid tilling the topsoil.
- C. N Use a chemical to control insects just because the insect was a problem last year.  
S Plant a crop that does not attract the insect that was a problem last year.
- D. N Use all the land for crops so that animals don't have a natural food supply.  
S Provide an area on the farm where wildlife can live and eat without destroying crops.
- E. S Use chemicals only when needed and in the proper amounts.  
N Avoid the use of all chemicals even if it results in the loss of half of the all crops to weeds and insects.
- F. S Plant green areas with trees between fields and water sources so that chemicals and soil cannot get into the water.  
N Avoid green space on the farm so that more crops can be planted.

## GRADE 5-6 ENVIRONMENTAL BENEFITS OF PLANT BIOTECHNOLOGY

Soybean products: oil, ink, soy crayons, soy candles, soy soaps and shampoo, tofu, soy milk, meat substitutes

Corn products: Corn syrup, cereals, corn chips, fuel, tortillas, breads, oil, corn starch

Cotton: Clothes, linens, towels, oil

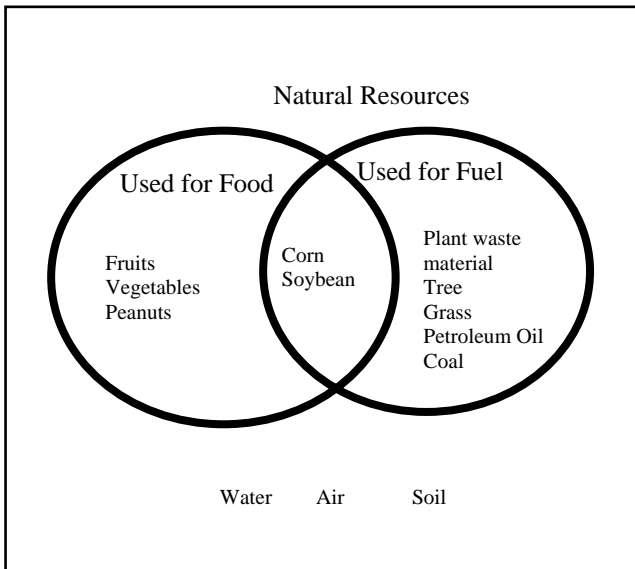
## GRADE 4 & 5 GROWING OUR FUELS

### Activity 1

Step 1: The result will be a depletion of oil resources. The oil will run out before all the students get some.

Step 2: All students are able to have a supply of the ethanol. If plantings run low, just have the students replant more corn.

### Activity 2



## GRADE 4 & 5 A PLACE AND TIME

### Activity 1

1. Oil sources primarily located in the Middle East  
Oceans: Requires shipping oil  
Buried underground: requires mining
2. Soils are deep, fertile, and rich in organic matter  
The land is level.  
The nights are warm and the days are hot days.  
Adequate rainfall
3. More people  
Cars have allowed people to go farther therefore, cities have been able to sprawl outward. Farmland has been converted to subdivisions.  
People are living in less dense settings in larger homes and lots.  
Less farmland

### Activity 2

Answers will vary



# ANSWER KEY BIOFUELS UNIT

## GRADE 5 & 6 — POSITIVE ENERGY SUPPLY

### Activity 1

Sun Shines



Plant Corn



Apply fertilizer and chemicals to control weeds if needed



Harvest



Transport to Ethanol Plant



Ferment the corn into ethanol



Transport the ethanol to station

Energy flow to fuel the human body:

To fuel the human body the energy flows from the sun to the corn. If eaten as corn it is trucked to stores. Our body must then convert it into sugar to be used as energy. If the corn is made into other foods, it is first trucked to a food production plant and used for producing food such as cereal. The cereal is then trucked to stores. Once consumed by us our body converts it into sugar to be used as energy.

## GRADES 5 & 6 – WHAT'S DRIVING BIOFUELS?

### Activity 1

1. Increase ethanol production.
2. More cars will be converted to use ethanol.
3. The farmer is able to put more money back into the economy because he has more to spend.
4. No more oil spills devastating the environment.
5. Less smog
6. More jobs for rural communities