



"PLANT A SEED IN TENNESSEE"

FIFTH GRADE CURRICULUM

Draft

Tennessee Foundation for Agriculture in the Classroom
PO Box 313
Columbia, TN 38402

"Plant a Seed in Tennessee" Fifth Grade Curriculum

Draft -- June 2009

PREFACE:

The Tennessee Foundation for Agriculture in the Classroom was established to promote "agricultural literacy", or a greater awareness, understanding, and appreciation of agriculture's influence on our lives, to students throughout the state of Tennessee. The "Plant a Seed in Tennessee" Fifth Grade Curriculum is just one of the educational resource materials that is available to educators through the Foundation. This material is designed to enhance classroom studies and presentations and to supplement the basic school curriculum. In addition to these materials, training workshops for teachers and other programs are available through the Tennessee Agriculture in the Classroom program.

ABOUT THIS MATERIAL:

This is the first draft of the new Fifth Grade "Plant a Seed in Tennessee" curriculum. Due to the emphasis on math and language arts subject areas, we are trying a new format. Please keep in mind that it is **ONLY** a draft. There are many additions, corrections, etc... that have to be made.

Each lesson plan has been correlated to meet Tennessee Department of Education Curriculum Standards.

CONTACTS:

If you have any questions regarding this material or any other material or programs sponsored by the Tennessee Foundation for Agriculture in the Classroom, please contact:

Tennessee Foundation for Agriculture in the Classroom

PO Box 313

Columbia, TN 38402

Phone: 931.388.7872

Fax: 931.388.5818

or

visit our web site

www.tnfarmbureau.org



FROM SEA TO SHINING SEA

Math: 5.1.spi.4

5.5.spi.1

5.5.1

5.5.1 d

5.1.3

5.1.3 d

Social Studies: 5.3.01

5.3.03

5.3.spi.6

5.3.spi.7

Language Arts: 1.07

1.09

5.1.06

5.1.06 a

5.2.02

BRIEF DESCRIPTION:

Students complete a United States map showing the locations of the states, their capitals, and the top five agricultural commodities in each state. They then identify and graph the top five commodities nationally after compiling the information.

LEVEL:

Fifth Grade

SUBJECT:

Language Arts, Math, Social Studies

SKILLS:

Analyzing, Brainstorming, Classifying, Collaborating, Communicating, Comparing similarities and differences, Computing, Concluding, Creating Graphs, Developing Vocabulary, Discussing, Drawing, Following Directions, Identifying, Listing, Locating, Mapping, Public speaking, Reasoning, Recognizing relationships, Sequencing, Writing

OBJECTIVES:

The student will:

- label a United States map with each state's name, capital and region
- draw and/or place symbols on a U.S. map of the top five agricultural commodities of each state in a specific region
- identify major agricultural regions of the United States
- list the top five commodities for each agricultural region
- create graphs depicting the top five commodities nationally
- compute the commodity cash receipts for the top five and bottom five states

ESTIMATED TEACHING TIME:

Three, 45-minute sessions

Today, less than 2 percent of Americans work in production agriculture, or what we call "farming." This small group produces the food and fiber needs of the nation, as well as of many people abroad. People throughout the world look to the United States as both the world's largest agricultural exporter and greatest donor of foreign food aid. Because of our country's climate, soil, water, technology, and free enterprise system, American farmers are among the best producers the world has ever known.

At the time of the American Revolution, one farmer could feed three people. By 1900, that number had grown to seven. Today, one American farmer can feed an average of 129 people - 101 in the United States and 28 abroad. Of course they do not produce that bounty alone. The food and fiber industry, along with its related occupations of processing, packaging, transporting, wholesaling, and retailing generates billions of dollars each year. One out of every five jobs in the United States or 22 million total jobs depend on agriculture in some way. It's the nation's largest industry, as well as the leading industry for many states.

As distinguished from services, a commodity is an economic product of agriculture, mining, and sometimes manufacturing. Following are general descriptions of some of the commodities listed in the chart. Plan to share this information with students according to recent data.

Aquaculture - fish, seafood and aquatic plants raised for food, scientific use, educational use, and aquariums (in tanks, cages and ponds specifically for this purpose)

Broilers - tender young chickens suitable for broiling

Cattle/Calves - as produced for beef (cattle) and veal (calves)

Corn - as used for animal feed, bird seed, meal, and other uses (not sweet corn)

Dairy Products - fluid milk, cheese, ice cream, cultured

products (e.g., sour cream, yogurt)

Greenhouse - ornamental plants, flowers, tomatoes, cucumbers, and vegetables that are grown hydroponically

Nursery - deciduous trees, coniferous trees, shrubs, and perennials

Sheep/Lambs - as produced for meat and wool

Cattle/calves account for the largest amount of cash receipts among agricultural commodities. Nursery and greenhouse production represents the fastest growing agricultural area. The category of nursery and greenhouse products is one of the top five agricultural commodities in 25 states, including Alaska, where it makes up over half of Alaska's agricultural cash receipts. Factors that influence the wide variety of commodities produced in the United States include a variety of terrain, soil types, and climate. Also important are large, flat areas for mechanized agriculture; water resources for irrigation and transportation of agricultural products; and land that can be used for grazing.

The USDA divides the United States into 10 main farm production regions. Each region differs in soil type, terrain, climate, distance to market, and storage and marketing facilities. The U.S. Farm Production Regions chart identifies the states and the primary commodities produced in each region.

As students learn about the United States from sea to shining sea, toss in those amber waves of grain and other agricultural commodities to help students learn about the food, land, and people connections of "America the Beautiful."

U.S. Farm Production Regions

Region	State Abbreviations	Major Commodities Produced
Northeast	CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT	This region encompasses diversified agricultural production; milk-producing area; fruits and vegetables; nursery and greenhouse crops; forage crops for states listed. In addition, broiler farming is found in ME, DE and MD, and maple syrup is produced in CT, MA, ME, NH, NY, and VT.
Appalachia	KY, NC, TN, VA, WV	This region is a major tobacco-producing area. Also produced are peanuts, cattle, dairy products, pork, and horses.
Southeast	AL, FL, GA, SC	This region produces beef, broilers, fruits, eggs, vegetables, peanuts, soybeans, rice, and cotton. In addition, sugarcane, tropical fruits, nursery crops, and citrus are produced in FL.
Lake States	MI, MN, WI	This region is a major milk-producing area. It also produces field and forage crops; fruit along the Great Lakes; and sugar beets.
Corn Belt	IA, IL, IN, MO, OH	Field crops and the livestock fed by those field crops are produced in this region. This includes corn, beef, hogs, dairy products, other feed grains, soybeans, and wheat.
Delta States	AR, LA, MS	These Southeastern states comprise the major broiler-production area of the country. Production also includes soybeans, cotton, rice, and sugarcane.
Northern Plains	KS, NB, ND, SD	Grains dominate the agricultural production of this region. Winter and spring wheat, other small grains, sorghum, hay, forage crops, and cattle are produced here.
Southern Plains	OK, TX	Cattle and grain production dominate this region's agriculture. Winter and spring wheat, other small grains, sorghum, hay, forage crops, cotton, and cattle are the main agricultural commodities produced.
Mountain	AZ, CO, ID, MT, NM, NV, UT, WY	Cattle and sheep dominate the agriculture of this region. There is a diverse assortment of commodities produced that include: hay, sugar beets, potatoes, fruits, and vegetables. Wheat is produced in the region's northern states. The southern states produce citrus, rice, cotton, chili peppers, and onions.
Pacific	AK, CA, HI, OR, WA	This region is one of the most agriculturally productive and diverse in the nation. Wheat, fruit, potatoes, vegetables, cotton, and cattle are produced throughout much of the region. In addition, sugarcane and pineapples are grown in HI; greenhouse/nursery and dairy production occur in AK; nuts, citrus and raisins are produced in CA, along with hundreds of other commodities.

Materials:

- United States map with states and capitals
- Scissors
- Highlighters
- Drawing materials
- Rubber cement or glue
- United States map
- Top Five Commodities Produced in Each State information sheet
- Summary Questions
- Top Five Commodities in the United States worksheet

Procedure:

Session One:

1. Using school or overhead of US map, begin session.
2. Cut the US map included in this lesson into 10 regions. Cut along the heavy lines inside and outside the map. Or, if you prefer, cut the map into individual states.)
3. Divide the students into 10 groups.
4. Give each group a region (or individual states, if you cut the states apart). Have them write the name of their region on the back.
5. Have groups write the name of each state, its abbreviation, and locate and write its capital, using a star to note the location of the capital.
6. Ask:

"How do you remember the states and placement of states?"

Share some additional ways to learn the states and their state capitals. For instance, the state of Vermont is shaped like a "V," it is very mountainous, and if you take the "mont" off of Vermont, you will be able to remember Montpelier. Pennsylvania is the "hairy pen" state for Harrisburg. Or the main state in New England is Maine, and it is nice to visit in August, thus remember Augusta. The state of Minnesota is shaped like a mini-soda. Those sodas taste so heavenly you would think St. Paul must have made them.

Riddles can provide other fun memory triggers for learning states and capitals. Share these examples with students and see if they can guess the answers.

- a. Which state capital has an employer who weighs a lot? (Boston, MA)
 - b. Which capital is a French name for a male? (Pierre, SD)
 - c. Which capital is a type of grape? (Concord, NH)
 - d. Which capital has a car with feelings? (Hartford, CT)
 - e. Which capital is a famous explorer? (Columbus, OH and Raleigh, NC)
 - f. Which capital reminds you of Christmas? (Santa Fe, NM)
 - g. Which capital describes a cleared piece of land at a certain time of year? (Springfield, IL)
 - h. Which capital is named after a president? (Lincoln, NE and Jackson, MS)
7. Allow the students time to create clever ideas or riddles for remembering the state and its capital and abbreviation for the states in their region. Have each group share its ideas on learning and remembering the states and capitals.

Session Two:

1. Ask the students, "what is a commodity?" (A quantity of goods to be bartered, traded or sold. In reference to agricultural commodities, these are generally bulk grains, produce, meats, etc. that cannot be differentiated by producer or manufacturer of origin.)
2. Distribute the Top Five Commodities Produced in Each State information sheet to each group. Have students locate the states in their region, using the highlighters so they can easily locate the states and their commodities on the maps for their region. Have students make a list of every different commodity for their region. Tell students to make tally marks for each commodity. The tally indicates the frequency that each commodity appears. For example:

Broilers - 11
Cotton - 1
Tomatoes - 111
Hogs - 1
Wheat - 11

Make sure students understand the meaning of each commodity.

3. On a large map have groups make symbols for each of their top five commodities. Display each group's tally of state commodities.
4. Discuss findings for each region.

Session Three:

1. Assemble the map pieces together.
2. Now that the map is complete, have each group:
 - a. Write the name of the region across the states.
 - b. Graph the top five commodities nationally (as identified in Session Two, Step 2).
 - c. Using the Top Five Commodities Produced in Each State, calculate the total cash receipts for the top five states and the bottom five states. (Total for the top five states is approximately \$63.74 trillion; bottom five total is approximately \$970 million.)
3. Summarize the lesson by asking:
 - a. What are the five states with the top cash receipts? These may be color coded on the large map by outlining each state in green. In what ways are these states similar? Different?
 - b. What are the five states with the lowest cash receipts? These may be color coded on the large map by outlining each state in blue. In what ways are these states similar? Different?
 - c. What patterns with the commodities did you identify? (For example, Illinois and Indiana are adjacent, and corn is the #1 commodity in those states.)
 - d. Which commodities are seen the least? Why do you think that is? (Cranberries have only a seasonal demand and require special growing conditions that exist only in a few areas.)
 - e. What do you think would cause certain crops to be a leading commodity in one area and not another? (Temperature, precipitation, type of terrain, type of soil, length of growing season, transportation systems, and more.)
 - f. Why do you think livestock is more prevalent in some regions? (The land is unsuitable for cropland, but suitable for grazing.)
 - g. What commodities do you predict will become less important in the future? Why? (Replaced by something else easier to grow, or become less popular for health

reasons.)

- h. What are some ways the commodities in a state and/or region can help you remember its location, name, and capital?

Evaluation Options:

1. Have students write a paragraph addressing their conclusions about the top five agricultural commodities of their region.
2. Give the students a map of a region of the United States. Have them work in pairs to label and study the states and capitals of that region. (Use clever ideas that other students have come up with to remember the state name and capital). Give a quiz when you feel students are ready to label the same regional map with state names and capitals.

Extensions:

1. Have students design a travel brochure of their state(s) or region. The brochure can include a description of the topography, climate, special places of interest, the top agricultural commodities, and a map that shows the location of the principal rivers and cities, and transport systems (e.g., highway, rail, air) in the state(s).
2. Have students add longitudinal and latitudinal lines - for each 5 degrees - to their map. Have them discuss the commodities growing in relation to the longitude and latitude of the state.

Credits:

- Agricultural Statistics 2001. National Agricultural Statistics Service, United States Department of Agriculture. United States Governmental Printing Office. 2001. ISBN: 0160361583.
- Cash Receipts State Rankings. National Agricultural Statistics Service, United States Department of Agriculture. 2001. (Select economics_1htm) <http://www.usda.gov/nass/pubs/stathigh/2001/tables>
- Census Ranking of States and Counties. National Agricultural Statistics Service, United States Department of Agriculture. 2002. <http://www.nass.usda.gov/census/census97/rankings>

Additional Resources:

- Agriculture Fact Book 2001. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. (202) 512-1800. The most up-to-date information is available in the electronic version found under publications at USDA. <http://www.usda.gov>
- Agriculture in the Classroom. USDA South Building, Room 4307, Washington, DC 20250. (202) 720-7925. State contact and publications. <http://www.agclassroom.org>
- Farm Facts. American Farm Bureau Federation, 600 Maryland Ave. SW, Suite 800, Washington, DC 20024. (202) 406-3706. Voice of Agriculture. 2002. <http://www.fb.com>
- Natural Resources We Use: Food, Fiber, Fuel, Minerals (Poster). 2001. Mineral Information Institute and Project Food, Land & People. <http://www.foodlandpeople.org>
- Guthrie, Woody. This Land Is Your Land. Little, Brown & Company. 1998. ISBN: 0316392154.

Websites:

- National Agricultural Statistics Service. United States Department of Agriculture. 2002. <http://www.nass.usda.gov>
- Economic Research Service. United States Department of Agriculture. 2002. <http://www.ers.usda.gov>
- Agriculture in the Classroom, USDA South Building, Room 4307, Washington, DC 20250. (202) 720-7925. Call for information about your state contact.

Educator's Notes:

TOP FIVE COMMODITIES PRODUCED IN EACH STATE

By Cash Receipts

STATE	#1 COMMODITY	#2 COMMODITY
ALABAMA	Broilers	Cattle/Calves
ALASKA	Greenhouse/Nursery	Dairy Products
ARIZONA	Cattle/Calves	Dairy Products
ARKANSAS	Broilers	Rice
CALIFORNIA	Dairy Products	Grapes
COLORADO	Cattle/Calves	Corn
CONNECTICUT	Greenhouse/Nursery	Dairy Products
DELAWARE	Broilers	Greenhouse/Nursery
FLORIDA	Oranges	Greenhouse/Nursery
GEORGIA	Broilers	Cotton
HAWAII	Pineapples	Sugarcane
IDAHO	Dairy Products	Cattle/Calves
ILLINOIS	Corn	Soybeans
INDIANA	Corn	Soybeans
IOWA	Corn	Hogs
KANSAS	Cattle/Calves	Wheat
KENTUCKY	Horses/Mules	Tobacco
LOUISIANA	Sugarcane	Broilers
MAINE	Potatoes	Dairy Products
MARYLAND	Broilers	Greenhouse/Nursery
MASSACHUSETTS	Greenhouse/Nursery	Dairy Products
MICHIGAN	Dairy Products	Greenhouse/Nursery
MINNESOTA	Dairy Products	Soybeans
MISSISSIPPI	Broilers	Cotton
MISSOURI	Cattle/Calves	Soybeans
MONTANA	Cattle/Calves	Wheat
NEBRASKA	Cattle/Calves	Corn
NEVADA	Cattle/Calves	Dairy Products
NEW HAMPSHIRE	Greenhouse/Nursery	Dairy Products
NEW JERSEY	Greenhouse/Nursery	Horses/Mules
NEW MEXICO	Cattle/Calves	Dairy Products
NEW YORK	Dairy Products	Greenhouse/Nursery
N. CAROLINA	Broilers	Hogs
N. DAKOTA	Wheat	Cattle/Calves
OHIO	Soybeans	Corn
OKLAHOMA	Cattle/Calves	Broilers
OREGON	Greenhouse/Nursery	Cattle/Calves
PENNSYLVANIA	Dairy Products	Cattle/Calves
RHODE ISLAND	Greenhouse/Nursery	Dairy Products
S. CAROLINA	Broilers	Greenhouse/Nursery
S. DAKOTA	Cattle/Calves	Soybeans
TENNESSEE	Cattle/Calves	Broilers
TEXAS	Cattle/Calves	Cotton
UTAH	Cattle/Calves	Dairy Products
VERMONT	Dairy Products	Cattle/Calves
VIRGINIA	Broilers	Cattle/Calves
WASHINGTON	Dairy Products	Apples
W. VIRGINIA	Broilers	Cattle/Calves
WISCONSIN	Dairy Products	Cattle/Calves
WYOMING	Cattle/Calves	Sugar Beets

National Agricultural Statistics Service, USDA, 1999

Credit: Project Food, Land & People - "From Sea to Shining Sea"

#3 COMMODITY	#4 COMMODITY	#5 COMMODITY	RANK	CASH RECEIPTS (in millions)
Eggs	Greenhouse/Nursery	Cotton	23	\$3,438
Cattle/Calves	Hay	Potatoes	50	\$48
Lettuce	Cotton	Greenhouse/Nursery	30	\$2,178
Soybeans	Cotton	Cattle/Calves	11	\$5,259
Greenhouse/Nursery	Cattle/Calves	Tomatoes	1	\$24,801
Dairy Products	Wheat	Hogs	16	\$4,354
Eggs	Aquaculture	Tobacco	44	\$482
Soybeans	Dairy Products	Eggs	40	\$718
Sugarcane	Dairy Products	Tomatoes	6	\$7,066
Peanuts	Eggs	Cattle/Calves	12	\$5,241
Greenhouse/Nursery	Macadamia Nuts	Dairy Products	42	\$533
Potatoes	Wheat	Hay	24	\$3,347
Hogs	Cattle/Calves	Dairy Products	8	\$6,757
Hogs	Dairy Products	Eggs	15	\$4,373
Soybeans	Cattle/Calves	Dairy Products	3	\$9,716
Corn	Sorghum Grain	Soybeans	5	\$7,616
Cattle/Calves	Broilers	Dairy Products	22	\$3,456
Cotton	Rice	Cattle/Calves	33	\$1,848
Eggs	Aquaculture	Blueberries	43	\$515
Dairy Products	Cattle/Calves	Soybeans	35	\$1,481
Cranberries	Sweet Corn	Apples	45	\$396
Soybeans	Corn	Cattle/Calves	21	\$3,470
Corn	Hogs	Cattle/Calves	7	\$7,061
Aquaculture	Soybeans	Cattle/Calves	25	\$3,174
Hogs	Corn	Broilers	17	\$4,256
Barley	Hay	Sugar Beets	34	\$1,716
Soybeans	Hogs	Wheat	4	\$8,555
Hay	Greenhouse/Nursery	Onions	47	\$334
Apples	Cattle/Calves	Hay	48	\$153
Dairy Products	Blueberries	Peaches	39	\$740
Hay	Pecans	Greenhouse/Nursery	32	\$1,953
Cattle/Calves	Apples	Hay	26	\$3,097
Greenhouse/Nursery	Tobacco	Turkeys	9	\$6,688
Sunflowers	Soybeans	Sugar Beets	28	\$2,759
Dairy Products	Greenhouse/Nursery	Eggs	14	\$4,429
Wheat	Hogs	Dairy Products	19	\$3,991
Dairy Products	Rye Grass	Hay	27	\$3,052
Mushrooms	Greenhouse/Nursery	Eggs	18	\$4,070
Sweet Corn	Potatoes	Cattle/Calves	49	\$48
Turkeys	Tobacco	Cattle/Calves	36	\$1,406
Corn	Wheat	Dairy Products	20	\$3,539
Dairy Products	Tobacco	Greenhouse/Nursery	31	\$1,974
Greenhouse/Nursery	Broilers	Dairy Products	2	\$13,052
Hay	Greenhouse/Nursery	Hogs	37	\$967
Greenhouse/Nursery	Hay	Maple Products	41	\$541
Dairy Products	Turkeys	Greenhouse/Nursery	29	\$2,283
Cattle/Calves	Potatoes	Wheat	13	\$4,933
Dairy Products	Turkeys	Eggs	46	\$387
Corn	Potatoes	Soybeans	10	\$5,596
Hay	Sheep and Lambs	Hogs	38	\$852

National Agricultural Statistics Service, USDA, 1999

Credit: Project Food, Land & People - "From Sea to Shining Sea"

SUMMARY QUESTIONS

Regional Questions

1. What is the name of your region?
2. What are the names of the states in your region?
3. What are the top five commodities for your region? Are any of these the top five commodities nationally?
If so, which ones?
4. What unique commodities are found in your region? Why is this?
5. What surprised you about what is grown in your region?

National Questions

1. Look at the U.S. map. Why do you think states are arranged into these 10 major farm production regions?
2. How do the commodities in your region compare with the commodities in other regions?
3. What are some of the similarities among the region?
4. What patterns do you see among the commodities across the country?
5. Which commodities are seen least often? Why do you think that is? What are the limiting factors?
6. Which states grow oranges?
Which states grow cotton?
Which states grow corn?
Which states have a lot of cattle?
7. Which have greenhouses as their number one commodity?

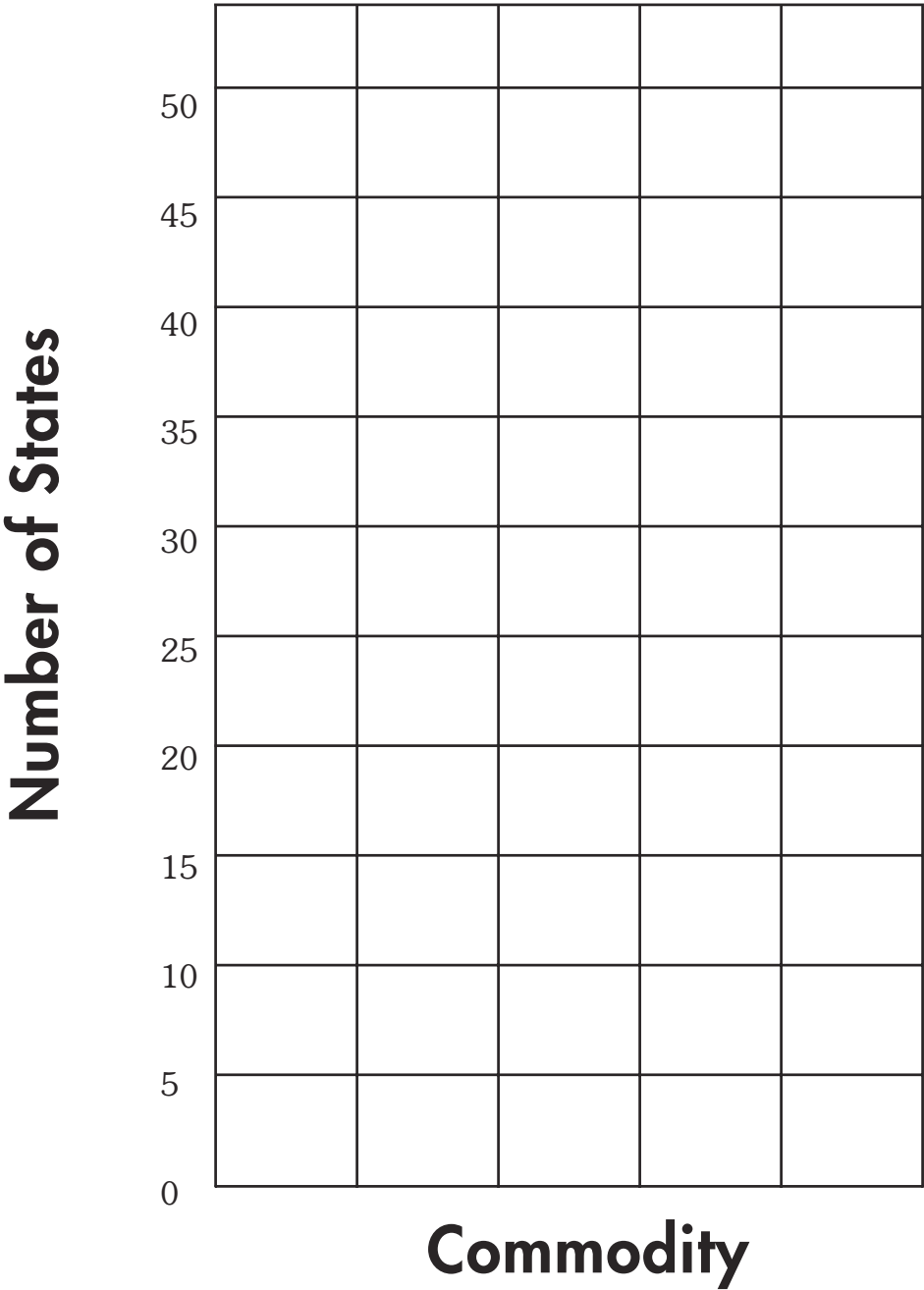
Why would Alaska have greenhouses as the #1 commodity?

Alaska produces the least amount of agricultural products. Do you think this will remain so in the future?
8. What surprises you the most about what is grown in Alaska?
What surprises you the most about what is grown in Louisiana?
What surprises you the most about what is grown in other states?

Name: _____

TOP FIVE COMMODITIES IN THE UNITED STATES

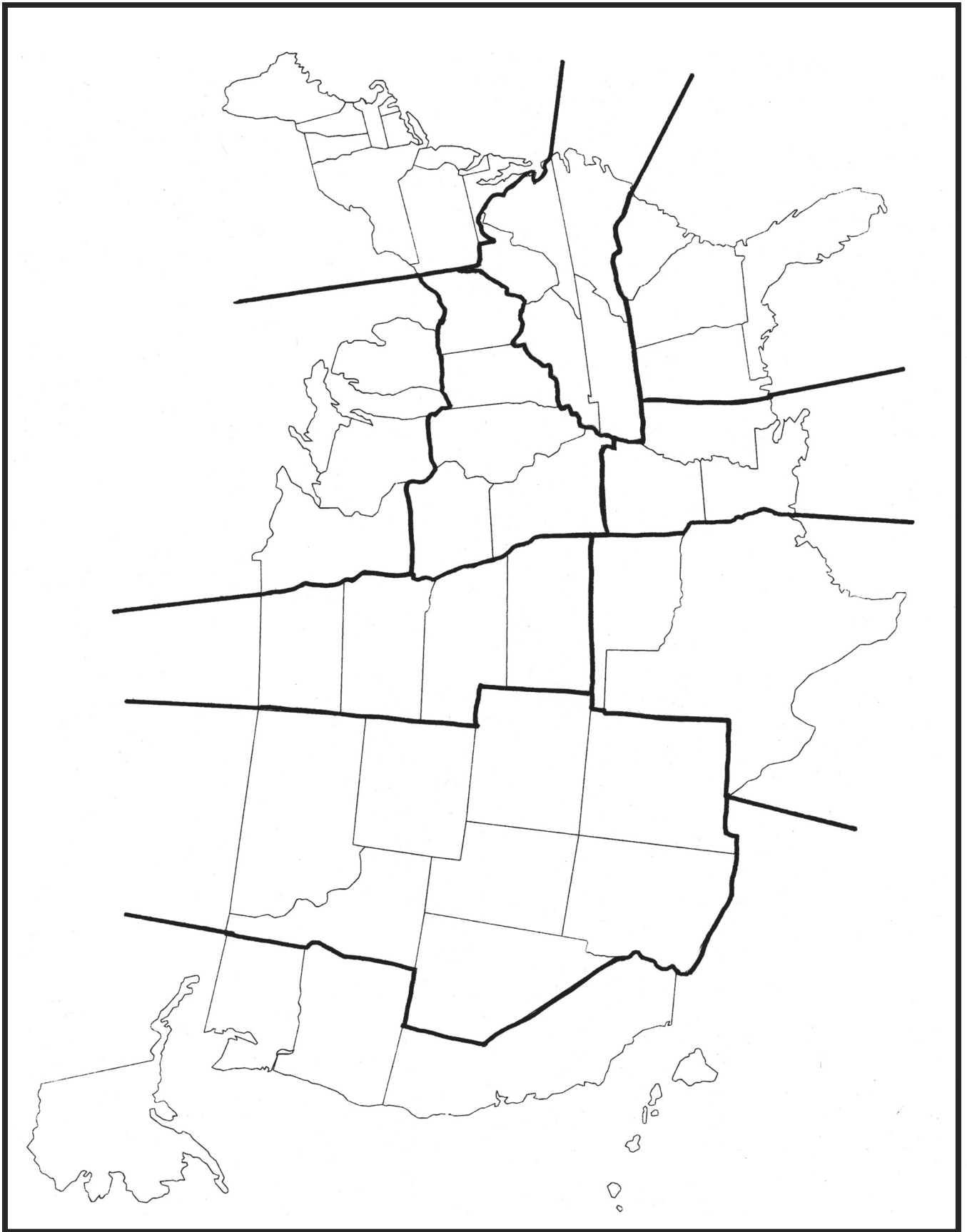
Directions: Identify the top five commodities nationally. Graph the number of states for each of these five commodities. Write the name of each commodity on the bottom of the graph.



WHERE FOODS ARE GROWN

FOOD	LOCATION
Apples	Northeast, Northwest, Michigan, United States
Cherries	Michigan, New York
Grapes	California, New York, Michigan, South America
Bananas	Ecuador, other Central and South American countries
Chocolate	Africa, South and Central America
Citrus fruits	California, Florida, Texas, Central and South America, Israel
Milk & Dairy Products: Milk Yogurt Butter Ice cream	Leading states: California, Wisconsin, New York, Pennsylvania, Minnesota Additional states producing large quantities of milk: Texas, Michigan, Washington, Idaho, Ohio
Cereal: Wheat: Corn: Rice: Oats:	Kansas, North Dakota, Montana, Washington Illinois, Iowa, Nebraska, Indiana California, Louisiana, Texas Wisconsin, North Dakota, Minnesota, Iowa, South Dakota
Potatoes	Maine, Idaho, New York
Meat: Beef: Pork: Lamb: Chicken:	Texas, Nebraska, Kansas, Colorado, Iowa, Illinois, Minnesota, Illinois, Indiana, Iowa, Missouri, Nebraska, Minnesota Australia, New Zealand Arkansas, Georgia, Alabama, North Carolina
Eggs	California, Georgia, Indiana, Arkansas
Nuts	California, Texas, Georgia, Mississippi
Peanuts	Southern states, Africa

UNITED STATES



MAP SOURCE: CENSUS OF AGRICULTURE, USDA

Credit: Project Food, Land & People - "From Sea to Shining Sea"



PLANT A PIZZA

Science: GLE 0307.T/E.5
SPI 0307.1.1
Health: Standard 13
13:1

In optimal situations, this lesson will lead to a school garden, with direct participation from your students. However, if school grounds do not permit, your class will still benefit from learning about environmental interdependency and sustainable agriculture.

PLANT A PIZZA

Materials Needed:

- Activity worksheet
- Plant A Pizza Design worksheet
- Excerpts from Carrots Love Tomatoes by Louise Riotte
- Tomato, basil, oregano, and pepper plants
- Onion bulbs
- Wheat seed
- Gardening tools (shovel, hoe, and cultivator)
- Compost and mulch
- Available land or containers for planting

Procedure:

1. You may want to start (or end) the lesson with a making pizza experience. Introduce the activity with a discussion of the basic ingredients of pizza. Ask the students to trace the origins of such ingredients back to the farm. For instance, instead of sauce, ask what the sauce is made from, i.e. tomatoes, onions, salt, oregano, and basil.
2. Then, concentrate on six of those ingredients (crops): tomatoes, onions, peppers, basil, oregano, and wheat. You will design a garden layout for those six crops using companion planting, a strategy within Integrated Pest Management (IPM). Companion planting is the practice of placing crops near other plants that naturally repel pests, or add nutrients, or provide structure or shade. Tomato, pepper, basil, and oregano plants, along with onion bulbs, are available at most garden stores in the spring. Wheat

BRIEF DESCRIPTION:

This lesson uses the students' comprehensive abilities to develop an environmentally-responsible plan for a pizza garden. Overall, this activity provides a direct experience with the necessary building materials (food, water, and air) to supply energy for plant growth and food production.

LEVEL:

Fifth Grade

SUBJECT:

Science, Health

SKILLS:

Analyzing, Investigating, Reasoning, Thinking Creatively, Identifying, Describing, Observing, Predicting

OBJECTIVES:

The student will:

- understand the basic ingredients for a popular American food
- recognize the interdependency of plants within the environment
- design and plant an interdependent garden
- responsibly maintain the garden, meeting the plants' needs for water, nutrition, and pest control

ESTIMATED TEACHING TIME:

45 minutes, plus planting and maintenance of the garden

- may be a little more difficult to find; however, search out your local mill or Co-op.
3. This activity promotes IPM, and therefore, promotes a sustainable farming system. Likewise, we suggest using compost ("gardener's gold"), which is an excellent choice for plant nutrition. Compost improves soil health by contributing major and minor nutrients. In addition, compost adds organic matter, which enhances the soil's ability to retain moisture while also increasing the amount of oxygen in the soil. Finally, compost is a renewable resource that your class can make during the school year!
 4. In a like manner, we suggest the use of mulch (local source of straw or wood chips) around the plants to help retain soil moisture and prevent weeds. We also recommend the use of mechanical controls (like picking the insects off the plants and regularly hand weeding with a hoe or cultivator) instead of pesticides and herbicides. Such practices provide additional opportunities to discuss the environmental, economic, and social benefits/costs of sustainable agriculture.
 5. Ask students the following:
 - a. What is the name of the practice of placing crops near other plants that naturally repel pests, or add nutrients, or provide structure or shade?
 - b. What is Integrated Pest Management?
 - c. What are the benefits of IPM?
 - d. What is the most difficult step of growing food in the Pizza Garden?

Extension:

1. Continue the gardening experiences with the growing of crops to make a salad (i.e. lettuce and carrots). Add tomatoes and green peppers from the Pizza Garden for additional flavor.

Resources:

Books to accompany the lesson

1. Carrots Love Tomatoes by Louise Riotte
2. Rodale Weekend Gardener by Erin Hynes
3. The Big Book of Gardening Secrets by Charles W.G. Smith
4. The New Organic Grower by Eliot Coleman



Plant A Pizza

Name: _____

Date: _____

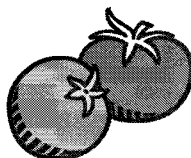
Overview: What makes up pizza? Within this lesson, you will discuss the basic agricultural ingredients of pizza. Then, using a concept within Integrated Pest Management, you will design a pizza garden according to companion planting. Finally, if space and time allow, you will 'Plant A Pizza' Garden!

1. What are common ingredients found on pizza? List below:

Toppings

Sauce

Crust



Suppose we wish to grow some of the above pizza ingredients. Specifically, we wish to plant:

- onions and peppers for the toppings
- tomatoes, basil, and oregano for the sauce
- wheat for the crust

We will design a garden for these ingredients that utilizes **companion planting**. The foundation for companion planting is **intercropping**, which "works on the principle that certain plants respond synergistically to each other's company" (*Gardening Secrets* by Charles W.G. Smith). In other words, certain plants help other plants to grow well, in addition to repelling pests. Companion planting is one strategy of **Integrated Pest Management (IPM)**; in fact, it is a cultural control method within IPM. IPM is the use of a variety of methods (such as

biological, mechanical, and cultural) to control pest problems and minimize economic, health, and environmental risks. IPM is a more sustainable approach to managing pests than conventional chemical control. Pests may include insects, rabbits, mice, deer, unwanted plants (weeds), and microorganisms (bacteria and viruses).

2. From the IPM literature, discuss at least five other strategies within IPM:

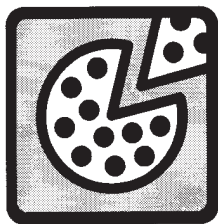
Now, let's design our pizza garden using IPM's companion planting! Refer to the handout *Excerpts from Carrots Love Tomatoes*. You are assigned to design a garden with six crops: basil, onions, oregano, peppers, tomatoes, and wheat. The pizza garden will have six "slices"; each "slice" being planted with one type of crop. Using the information provided, answer the questions below.

3. Which of the following crops should be planted next to tomatoes? (Circle all that apply)

Basil Onions Oregano Peppers

4. TRUE or FALSE: Basil is *not* compatible with sweet peppers. _____

Use this information to create the garden layout on the next page.

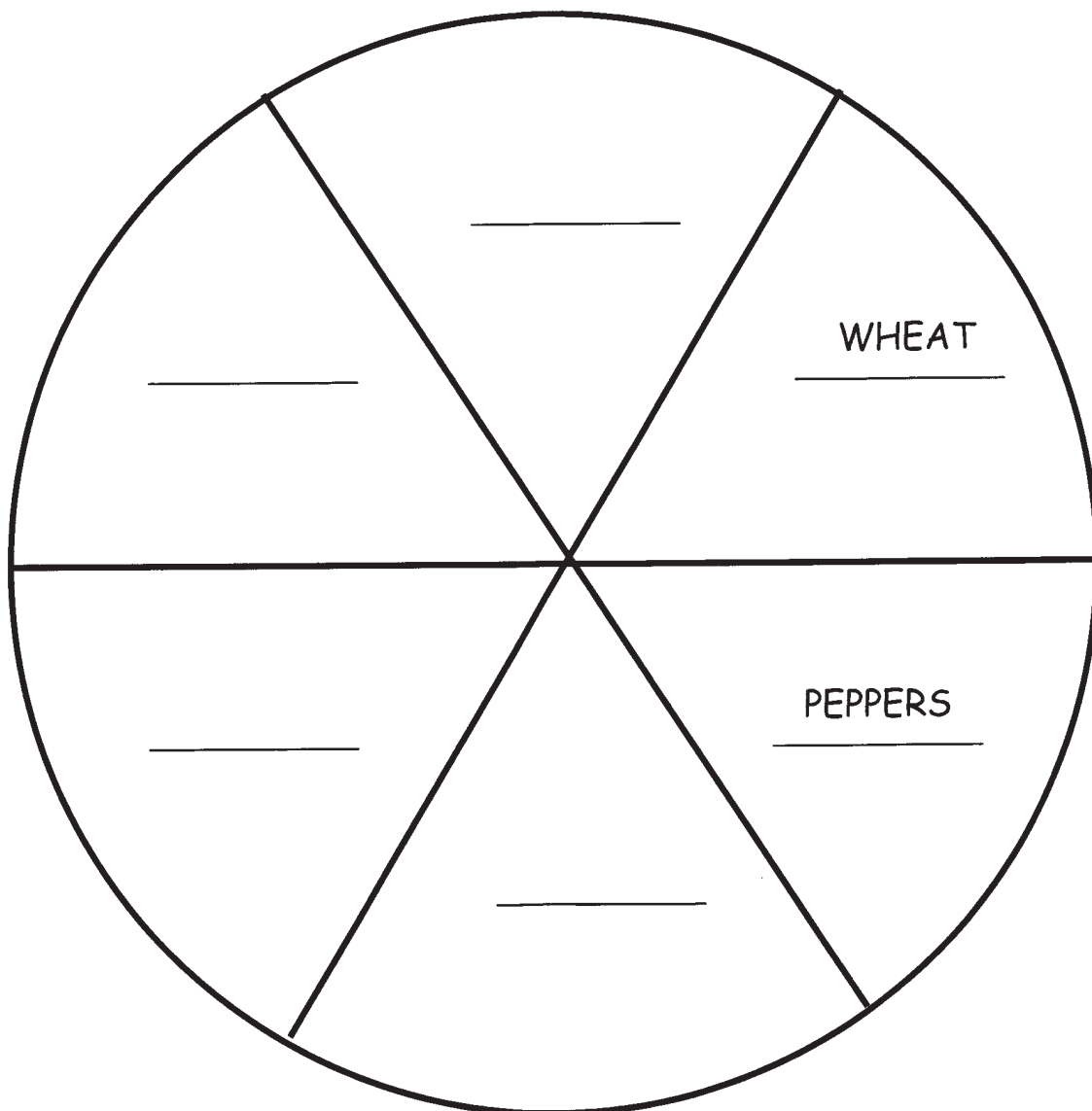


Plant A Pizza Design Worksheet

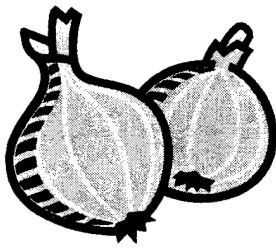
Name: _____

Date: _____

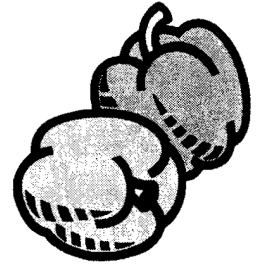
Using companion planting, label each "slice" with a different type of crop.
Wheat and peppers have already been designated.



Information for this lesson has been provided by Charles W.G. Smith's Gardening Secrets, Louise Riotte's Carrots Love Tomatoes, the Northeast Rural Development IPM Newsletter, and the University of Maryland Cooperative Extension Service.



Excerpts from
Carrots Love Tomatoes
By Louise Riotte



Vegetables

Onion - Page 20 (Carrots Love Tomatoes)

Onions and all members of the Cabbage family get along well with each other. They also like beets, strawberries, tomatoes, lettuce, summer savory, and chamomile (sparsely), but do *not* like peas and beans. Ornamental relations of the onion are useful as protective companions for roses. Since onion maggots travel from plant to plant when set in a row, scatter your onion plants throughout the garden.

Sweet Pepper - Page 22 (Carrots Love Tomatoes)

The general requirements of sweet peppers are surprisingly like those of basil, so plant them together. Sweet peppers also grow well with okra, and since they are very brittle plants, the okra, growing taller, serves as a windbreak.

Tomato - Pages 25 and 26 (Carrots Love Tomatoes)

Tomatoes and all members of the Brassica (Cabbage) family repel each other and should be kept apart. Tomatoes also dislike potatoes and fennel. Tomatoes will protect asparagus against the asparagus beetle. Tomatoes are compatible with chives, onion, parsley, marigold, nasturtium, and carrot, and for several years I [the author Louise Riotte] have planted garlic bulbs between my tomato plants to protect them from red spider mites.

Herbs

Basil - Pages 29 and 30 (Carrots Love Tomatoes)

Basil helps tomatoes to overcome both insects and disease, also improving growth and flavor. Since this is a small plant, one to two feet tall, grow in parallel rows to the tomatoes rather than among them. It repels mosquitoes and flies, and when laid over tomatoes in a serving bowl will deter fruit flies.

Oregano - Page 43 (Carrots Love Tomatoes)

Sow with broccoli to repel the cabbage butterfly.

Pizza Starts on a Farm

Pizza crust is made from wheat. Farmers plant wheat kernels in the ground using a grain drill. Wheat looks like fresh new grass when it comes out of the soil and grows to be about two feet high.

The farmer harvests the wheat and hauls it in trucks or wagons to the country grain elevator where it can be stored. From there it is shipped by truck, rail, or barge to a terminal where it is exported or sold to various industries which make animal feed or food.

Materials Needed:

- Cookie sheet
- 1 Tbsp. dry yeast
- 1 cup water
- 1 Tbsp. sugar
- 1 1/2 tsp. salt
- 2 Tbsp. vegetable oil
- 3 1/4 cups flour, divided
- 1 cup pizza sauce
- Pizza toppings
- 2 cups shredded mozzarella cheese
- 2 tsp. Italian seasoning

Procedure:

1. Dissolve yeast in water.
2. Add sugar, salt, vegetable oil, and 1 1/4 cups flour.
3. Beat until smooth. Knead in remaining flour.
4. Cover the dough and let it rise in a warm place for one hour.
5. Flatten dough on a cookie sheet.
6. Spread pizza sauce over the dough.
7. Personalize your pizza with toppings such as sausage, pepperoni, mushrooms, green peppers, or onions.
8. Sprinkle cheese and Italian seasoning over pizza.
9. Bake at 375o for 15-20 minutes. Allow to cool before eating.



EXPRESSION CONNECTION

Language Arts: 5.1.12
5.2.10

Math: 5.5.1

Social Studies: 5.1.01
5.1.spi.1
5.1.tpi.7

Science: 5.2.tpi.1

5.2.tpi.2

5.3.spi.2

5.3.spi.3

Think quickly - what is the first word that comes to your mind when you hear the word land? You will probably get as many different answers as there are students in your group. Dirt, flat, territory, purchase, ground, boundaries, people, hilly, grazing, and horizon are just a few. It's fun to discover the variety of words that a single word can make us think of and how one word triggers several connections.

The words food, land, people and you can create some intriguing, enlightening, surprising, and significant connections when sparked within a group of students. For example, some students made these connections between food and you: feast, munchies, garden, hunger, fast food, crops, taste. These are some of the connections they made between land and farming: fields, erosion, acre, soil, tree farm, rural, conservation.

Another category in the How Are They Connected? game is "diverse cultures." We often think of diverse cultures in terms of ethnic diversity, but that is just one aspect of diversity. Many other diversities surround us every day: differences in age, gender, health, education, marital or economic status; rural and urban living; Northern, Southern, Eastern, and Western United States living; social, political, and religious organizations; and many more.

Students will make some new connections about food, land and people, and express their new connections through poetry. Your poets may launch into the three-line Haiku (hi-KU), in which they count syllables or the five-line Cinquain (sin-KANE), in which each line has a theme and a certain number of words and syllables. Some students may choose to use the Diamante (de-ah-MAN-tay) or Acrostic (ah-KROS-tic) poetry style. Word association and poetry are just two of many creative ways of connecting and expressing our thoughts about food, land, people, and you.

BRIEF DESCRIPTION:

Small groups of students play a word game that builds new connections between farming, food, land, people, and themselves. They then write poetry about those connections.

LEVEL:

Fifth Grade

SUBJECT:

Math, Language Arts, Science, Social Studies

SKILLS:

Brainstorming, collaborating, communicating, comparing similarities and differences, computing, cooperating, describing, developing vocabulary, explaining, listening, locating, making judgments, recognizing relationships, recording, thinking creatively, writing

OBJECTIVES:

The student will:

- identify words and/or phrases that relate in some way to farming and four categories: agriculture, environment, diverse cultures, and you
- use reference books to generate more connections
- evaluate the answers of another group
- compose one or more poetry styles using the words and phrases generated.

ESTIMATED TEACHING TIME:

Session One: One hour. (Can be taught in two sessions.)

Session Two: 30 to 45 minutes.

Materials Needed:

- Dictionaries
- Thesauri
- Glossaries from social studies or science texts
- Writing materials
- Poetry Styles sheets
- How Are They Connected? worksheet
- Adding It Up! tally sheet

Procedure:

Session One:

1. Divide the class into small groups of two to four students. Tell them they will be working together to complete a game using words about farming.
2. Distribute one How Are They Connected? worksheet to each small group. Explain that the object of the game is to fill in each of the boxes with words or phrases that relate to farming, as well as to the categories listed at the top of each column. Discuss some examples to show how the word, words, and/or phrases must begin with the letter at the front of each row. For instance, the letter at the beginning of the first row is "F." Therefore, the group must write farming-associated words or phrases that begin with the letter "F" under all the categories "Food," "Land," "People," and "You." The next row down begins with the letter "A," so each category must have a word or phrase that starts with an "A." And so on. (See Possible Connections sheet for examples.) Possible examples in the first row under "Food" are: fruit, fresh vegetables, or flavorful; "Land": fencing, fertile, farms; "People": future jobs, food festivals; "You": feast. Give the groups about 15 minutes to fill in as many boxes as they can concentrating on the easiest boxes first. It is challenging, so explain that you do not expect completion. Students can use a thesaurus, dictionary, glossary, and other resources to locate additional connections. Give them an additional 10 minutes or more for use of these references.
3. When time is called, distribute the Adding It Up! sheet to each group. Explain that they will pair up with another group and use this sheet to score their How Are They Connected? worksheets. Each group scores the opposing group's answers. Groups are awarded 10 points for each unique word or phrase; five points for each word or phrase that they have in common with the other group; and zero points for blank boxes. Instruct groups to use one tally mark to record the number of points earned for each word or phrase.
4. When groups have totaled their tally marks, have each group double-check its scoring by recalculating the group's addition and multiplication. Acknowledge the high-point winners.

Session Two:

1. Working individually, in pairs or in groups, have students choose a poetry style and compose a poem using words from their How Are They Connected? worksheet. (See illustrations of four styles of poetry.)
2. Once students complete their poetry, have them share within their groups and then with the class. Challenge students to write several different styles of poetry. Display their work. Students can decorate or place poems on paper they cut in shapes invoked by their poems.

Extensions:

1. Have students complete one or more of the following phrases and incorporate in theme paragraph:
 - a. Farming is important to me because ...
 - b. Farming is connected to the environment through...
 - c. Farming is connected to _____ because ...
2. Students construct a mobile, mural or diorama showing the connections. Students can create farm shapes and write their poems on them. Have students make flow charts or other visual displays of the connections among food, land, people, and you.

Resources:

- Clinton, Catherine. I, Too Sing America: Three Centuries of African American Poetry. Houghton Mifflin Company. 1998. ISBN: 0395895995.
- Fleishman, Paul. Joyful Noise: Poems for Two Voices (poems about insects). Harper Trophy. 1988. ISBN: 0060218525.
- Frost, Robert. Stopping By Woods On A Snowy Evening. Dutton Children's Books. 1978. ISBN: 0525401156.
- Harrison, Michael, Christopher Stuart-Clark. A Year Full of Poems. Oxford University Press Children's Books. ISBN: 0192761498.
- Hale, Gloria, editor. Read-Aloud Poems for Young People. Black Dog & Leventhal Publishers. 1997. ISBN: 1884822991.
- Harrison, David. Farmer's Garden: Rhymes for Two Voices. Boyd's Mills Press, Inc. ISBN: 1563977761.
- Hazen, Edith, Deborah Fryer. The Columbia Granger's Index to Poetry. 1990. ISBN: 0231071043.
- Hopkins, Lee Bennett. Weather: Poems for All Seasons (An I Can Read Book). HarperTrophy. 1995. ISBN: 0064441911.
- Livingston, Myra Cohn. Cricket Never Does: A Collection of Haiku and Tanka. Margaret McElderry. 1997. ISBN: 0689811233.
- Merriam, Eve. The Singing Green: New and Selected Poems for All Seasons. William Morrow & Company. 1992. ISBN: 0688110258.
- Nye, Naomi Shihab, editor. The Tree Is Older Than You Are; A Bilingual Gathering of Poems and Stories from Mexico. Alladin Paperbacks. 1998. ISBN: 0689802978.
- Panzer, Nora, editor. Celebrate America in Poetry and Art. Hyperion Paperbacks for Children. 1999. ISBN: 1562826654.
- Prelutsky, Jack. The Random House Book of Poetry for Children. Random House. 2000. ISBN: 0394850106.
- Rodes, Barbara, Rice Odell. Dictionary of Environmental Quotations. John's Hopkins University Press. Reprint 1997. ISBN: 0801857384.
- Rosen, Michael, editor. Food Fight (Poets Join the Fight Against Hunger with Poems to Favorite Foods). Harcourt Brace & Company. 1996. ISBN: 0152010653.
- Sendak, Maurice. Chicken Soup With Rice: A Book of Months. HarperTrophy. 1991. ISBN: 006443253X.
- Stevenson, James. Sweet Corn (poems). Beechtree Books. 1995. ISBN: 0688126472. <http://www.williammorrow.com>
- Stevenson, Robert Lewis. A Children's Garden of Verses, revised edition. Simon & Schuster. 1999. ISBN: 0689818823.
- Yolen, Jane. Water Music: Poems For Children. Boyds Mills Press. 1995. ISBN: 1563973367.

HOW ARE THEY CONNECTED?

Names: _____

Directions: Fill in each of the boxes with words or phrases that relate to farming as well as to the categories listed at the top of each column. Each space must be filled with a word or phrase that starts with the letter in the left column. Ten points are given for each word or phrase the other group does not have; five points are given for those words the other group also has written; no points are given for blank boxes.

	FOOD	LAND	PEOPLE	YOU
F				
A				
R				
M				
I				
N				
G				

HOW ARE THEY CONNECTED?

Names: _____

Directions: Fill in each of the boxes with words or phrases that relate to farming as well as to the categories listed at the top of each column. Each space must be filled with a word or phrase that starts with the letter in the left column. Ten points are given for each word or phrase the other group does not have; five points are given for those words the other group also has written; no points are given for blank boxes.

	AGRICULTURE	ENVIRONMENT	DIVERSE CULTURES	YOU
F				
A				
R				
M				
I				
N				
G				

ADDING IT UP!

Names: _____

Directions

1. Use the boxes below to tally the number of words or phrases the group is awarded in each point category. Each word or phrase is worth one tally. Count the tallies and multiply the frequency (total number of tallies) by the number of points awarded. Write the subtotals in the box on the right.
2. Add the subtotals at the bottom of this sheet to get a final point total.

10 POINTS: Words or phrases that are different from those of the other group.

Tally marks	Frequency x 10	Subtotal
	_____ x 10 =	_____

Write the best 10-point words below.

5 POINTS: Words or phrases that are the same as those of the other group.

Tally marks	Frequency x 5	Subtotal
	_____ x 5 =	_____

0 POINTS: For blank boxes.

TOTAL SCORE: _____ + _____ = _____
10 point subtotal 5 point subtotal **GRAND TOTAL**

POETRY STYLES

Haiku

Haiku is a form of Japanese poetry that consists of three lines. The first line has five syllables, the second has seven syllables, and the third has five syllables. The emphasis is syllabic instead of rhyming. For example:

*Fertile fields growing
Sunlight pouring upon them
Nurturing us all.*

*We plant our gardens
Mother Nature gives us food
We feast happily.*

Cinquain

Cinquain is a form of poetry that is based on the number of words or syllables. There are a total of five lines. Each line has a theme and a certain number of words or syllables.

Line one: the title written in two words or syllables.
Line two: a description of the title in four words or syllables.
Line three: a description of action in six words or syllables.
Line four: a description of a feeling in eight words or syllables.
Line five: another word for the title in two words or syllables.

These examples use words.

Large Ranches

*Tall grass, rolling hills
Always changing, cattle roaming, plants growing
Wild and free, uninhibited by man's domain, revitalized
Open range*

Farming Is

*Food of life always
Feeding me and the whole family
Farming animals and crops are very good things
Growing life*

This example uses syllables.

Gardens

*Patches of life
Nurturing you and me
Revitalizing our bodies
Growing*

POETRY STYLES (page 2)

Diamante

The diamante is a poem that is shaped like a diamond. It is used to show the relation of words through shades of meaning. The writer goes from one extreme to an opposite extreme, following a pattern made up of parts of speech. The pattern consists of:

noun
adjective, adjective
participle*, participle, participle
noun, noun, noun, noun
participle, participle, participle
adjective, adjective
noun

*Participles are words having characteristics of both verbs and nouns and are “ing” words.

For example:

*Garden
diverse, small
digging, weeding, watering
trowel, shovel, plow, tractor
plowing, spraying, irrigating
identical, vast
farm*

Acrostic

Acrostic poetry uses a word written down the left edge. Words or phrases are written on each line using the beginning letter of each line. For example:

*F*ertile fields of winter wheat reveal
*A*nimals traveling through the rows
*R*estoring their needs,
*M*igrating to their new homes as
*I*mmense stretches of land lie before them
*N*urtured by the gifts of farmland still
*G*rowing for another year.

Try words only with the Acrostic style.

<i>F</i> armland	<i>F</i> ine feast	<i>G</i> ardenias growing
<i>E</i> nvironment providing	<i>I</i> nventory	<i>A</i> pples ripening
<i>R</i> esources	<i>E</i> nsures	<i>R</i> ice fields
<i>T</i> o	<i>L</i> ong-term	<i>D</i> irt with worms
<i>I</i> nvest	<i>D</i> iversity	<i>E</i> ating fruits
<i>L</i> argely	<i>S</i> ustainability	<i>N</i> uts that squirrels gather
<i>E</i> arth's future		

As an extension, try an Acrostic diamante.

F _____
I _____
E _____
L _____
D _____

POSSIBLE CONNECTIONS

	FOOD	LAND	PEOPLE	YOU
	AGRICULTURE	ENVIRONMENT	DIVERSE CULTURES	YOU
F	-fondue -fructose -flavorful -fish -fruit -famine -fresh produce	-fencing -farms -fertile -forests -factory -fertilizers -fragile	-farmers -future job -festivals -friend -farm families -father -forester	-fast food -feast -future job -food -fabulous -flannels -fairs
A	-animals -aquaculture -agronomy -apples -avocados -appetizer	-acre -animals -arid -alternative -airplane -auger	-agriculturist -aborigine -athlete -accountant -ancient -architect	-abundance -appetite -active -awareness -awesome
R	-restore -replenish -radish -regulations -ranches -refreshment	-rabbits -rain -range -ranch -rich -roots	-recycle -rural living -researchers -resources -rancher -restaurants	-ranger -refreshing -relaxing -running -reliable -ready to work
M	-machinery -meat -market -matzo -mushroom -maize -macaroni -mango -moo	-migratory wildlife -minerals -marshlands -marsh -meadow -manure -manufacturing -majestic	-migrant farm workers -manager -meteorologist -mother -miners -merchant -musician -missionary	-money -menus -memories -muncher -meditate -morning -metabolism -mouth
I	-increased need -infestation -industry -ingredients -imported -incubation -indigo -iris	-Integrated Pest Management -irrigation -investment -iron -immense -insecticide	-interest -inventions -indigenous peoples -inspectors -investment of time -immigrants -investor -illustrator	-inherit -interesting -important -involved -ice cream -intelligent
N	-nutrients -native foods -native plants -natural -nachos -nectarines -nutmeg -nuts	-nitrogen -nutrients -nesting -noxious weeds -natural resources -nature -natural -necessity	-nutritionist -naturalist -nomad -neighbor -novelist -navigator -needlepointer -nibbler	-nature's treasure -noises -neighbors -nurture -native -nourish
G	-growing -grub -gyros -grits -granola -gourds -gram -groceries -grain	-ground -green -grassland -garden -germination -greenhouse -graze -gully	-globe -government scientists -gardener -grower -geologist -gourmet -grocer -gallant	-gastronomy -grape picker -great food -gifts -growing -grateful -gobble -green thumb

Credit: Project Food, Land & People - "Expression Connection"



GALA FIESTA JAMBOREE

Science:

GLE 0507.Inq.3

GLE 0507.Inq.5

GLE 0507.Inq.6

Language Arts:

GLE 0501.3.1

GLE 0501.3.2

GLE 0501.4.2

GLE 0501.4.3

Math:

GLE 0506.5.1

Social Studies:

1.01

1.02

1.03

5.1.01

BRIEF DESCRIPTION:

Students explore the role of celebrations in diverse cultures, their class, and the local community. After interviewing community members about favorite celebrations, they research various cultures' harvest festivals and prepare a celebration presentation for the class.

LEVEL:

Fifth Grade

SUBJECT:

Science, Language Arts, Math, Social Studies

SKILLS:

Analyzing, applying, collaborating, collecting data, communicating, comparing similarities and differences, creating graphs, describing, developing cultural awareness, developing self-understanding, discussing, generalizing, identifying, interviewing, listening, listing, predicting, public speaking, recording, researching, summarizing, valuing, writing

OBJECTIVES:

The student will:

- identify reasons why people celebrate
- survey students and adults, tally responses, and determine frequencies to discover people's feelings and preferences about celebrations
- research one harvest festival and present findings to class
- calculate the survey percentages and graph the top five responses of favorite celebrations

ESTIMATED TEACHING TIME:

45-60 minute sessions

Celebrations are wonderful parts of life throughout the world. They give us a glimpse at the values and traditions important in people's lives - including our own. We celebrate all sorts of occasions: the start of a new year, birthdays, natural events such as the equinox, and festivals of remembrance to honor the dead are just a few. Many religious festivals take place relative to new or full moons.

Harvest Festivals

Long ago, when most people grew their own food, they held festivals with prayer and feasting at harvest time to thank their gods or god for providing food. For example, more than 4,000 years ago the Egyptians enjoyed foods, music and sports at their harvest celebrations. Feasts, dancing and games were always part of the harvest home festivals in England, held after each grain harvest. In Sweden, harvest is celebrated at Marten Gas (Martin Goose). This festival begins with a feast. Dessert is always an enormous cake made from hundreds of eggs. Following the feast, children carry hollowed-out squashes and pumpkins as they parade through the town. A harvest festival called Onam is held at the end of the rainy season in Kerala, a state on the southern tip of India. It's a time when people clean their houses and decorate the floors. Children collect brightly colored flowers and weave them into colorful mats. Once the preparations are complete, people visit the temple to give thanks for the harvest. Then they feast on rice, vegetables, spiced curries, and sweet puddings. In some tropical areas, the warm weather makes for harvests of different fruits and vegetables throughout the year. Africa holds many different kinds of harvest festivals. Some African countries have a Christian celebration in autumn. Others celebrate in the traditional African style with music, drums and dances that tell a story to frighten or honor the spirits that are believed to affect the harvest.

State Fairs as Harvest Festivals

Harvest festivals are not just ancient history in faraway places. They are festive modern celebrations. You may not have thought of our county and state fairs as harvest festivals, but that's how they started. Fairs are an American cultural tradition as familiar as baseball and blue-ribbon apple pie. Every year up to 200 million people attend one or more of the more than 3,200 agricultural fairs held in North America each year. The word "fair" comes from the Latin word *feria*, which means holiday. While many people are drawn to fairs by the excitement of the midway and grandstand, fairs still are very much rooted in agriculture. Many young people today participate in the livestock judging and other competitions as members of 4-H or FFA. They often camp out on cots alongside their animals while at the fair, bringing everything from hair dryers to fresh clothes so they can stay close to feed, water, groom, and clean up after their livestock. The competition lets both young and old show what they know about farming practices. Over the years, as farmers strive to breed animals of the highest quality, livestock has been significantly improved through these competitions. Exhibitors are awarded ribbons and prize money called premiums. Winning animals may go on to the state fair to compete for more prizes.

Fairs feature other competitions, too. The domestic arts have been highly valued at American fairs since the days when nearly everything needed in the home was handmade by women. This included activities such as quilting, sewing, arranging flowers, crafts, embroidering, and cooking, canning, and preserving foods. All of us who like to eat, dress and live well have benefited from the competitions in these arts. Likewise, the competitions in garden produce and field crops have helped farmers to improve the quality of their crops and produce over the years. The biggest pumpkins, best tomatoes and other categories set new records every year. The carnival on the midway did not really become an integral part of the fair until the 1893 World's Columbian Exposition held in Chicago, which featured the world's first Ferris wheel. At today's fairs you can be flung, spun, turned, and flipped on all kinds of rides and eat fun foods until you burst. But remember that you can also admire the prize-winning livestock and other competitions that honor the ancient tradition of celebrating harvest bounty.

More Harvest Festivals

One of the world's new harvest festivals is Kwanzaa. This holiday is loosely based on African harvest festivals and is celebrated by Americans of African descent. The name Kwanzaa comes from the Kiswahili phrase meaning "first fruits." It started in 1966 when Dr. Maulana Karenga and a group of organizers, friends and family joined in Los Angeles to commemorate their African heritage. This celebration, lasting from December 26 through January 1, was the beginning of the Kwanzaa tradition. Dr. Karenga believed that black people in America needed to connect with their African ancestry, combining the old traditions with a set of principles for the new community. Kwanzaa has seven days, seven symbols and seven principles. Each day families gather together and light a candle. They think and talk about one of the seven principles developed by Dr. Karenga. These principles and their meanings are: *umoya* (oo-MOH-jah), togetherness or unity; *kujichagulia* (koo-ji-cha-goo-LEE-ah), self-determination; *ujima* (oo-JEE-mah), cooperation; *ujamaa* (oo-jah-MAH), cooperative economics or buying things from each other; *nia* (NEE-ah), purpose; *kuumba* (koo-OOM-bah), creativity; and *imani* (ee MAH-nee), faith. The seven symbols and what they stand for are:

- An *mkeka* (em-KAY-kuh) or woven straw mat laid on a low table. It symbolizes tradition.
- A *kinara* (kee-NAH-rah) or seven-branched candle holder. It represents African ancestors.

- Mishumaa sabe (me-shew-MA SA-ba) or seven tall candles for the kinara. The seven candles symbolize the seven ideals or principles, which correspond to the seven days of the celebration. One black candle in the center represents the people. Three red candles stand for the struggles for justice. Three green candles stand for hope and good luck for the future. Surrounding the kinara are the other Kwanzaa symbols.
- A basket of mazao (ma-ZA-oh), fruits and vegetables that stand for the harvest.
- One muhindi (moo-HIN-dee) or ear of dried corn, for each child in the family.
- A kikombe cha umoja (kee-KOM-bay cha ooh-MO-juh) or community cup, which is a symbol for unity, or staying together.
- Zawadi (za-WAH-dee) or gifts.

Throughout Kwanzaa, friends and family gather to celebrate and to ask, Habari gani? This means, "What's the news?" Each day a different principle is the answer to that question. A child is chosen to light the mishumaa sabe in the kinara and talk about the principle for that day. On the sixth day of Kwanzaa, people have a big feast. It may include peanut soup, chicken stew, collard greens, black-eyed peas, fish, fruits, and bread.

According to the principle of ujima, everyone helps by bringing food. They decorate with the Kwanzaa colors. On the final day, when all the candles are lit, the children are given gifts or zawadi. One gift is usually a book. The other is often something creative, inspirational or meaningful, such as a homemade item, something from Africa, or something passed down from older generations. Together everyone says, Harambee (ha-ROM-bay)! (Pull together!) Everyone drinks from the kikombe to show unity.

Sukkoth

Sukkoth (su-KOOTH) is a Jewish festival in the fall. It begins 14 days after Rosh Hashanah and four days after Yom Kippur, two other important Jewish holidays. Because Sukkoth commemorates the 40 years Jews wandered in the desert in search of the Promised Land, it is a reminder of the temporary nature of our material possessions. Sukkoth also celebrates ancient harvests, times when families moved into the fields to complete the work before the winter rains began. They built temporary huts or sukkahs. After the harvest, the Jewish farmer in ancient Israel had to set aside a good part of the harvest for the priesthood and some of it for the poor. Jewish families who celebrate Sukkoth today make outdoor huts similar to the early sukkah. They often eat their meals for the week there. The roof of a sukkah is made from branches and leaves. People hang the fruits of the harvest such as apples, grapes and peaches from the branches as decorations. They carry willow, palm and myrtle branches in their right hand to symbolize a commitment to positive actions and speech. In their left hand, they carry an ethrog, a fragrant citrus fruit that looks like a big lumpy lemon. The ethrog symbolizes intellect. The willow, palm, myrtle, and ethrog are four kinds of plants that help celebrants appreciate what they have and realize what is important in their lives.

Pongal

This four-day harvest festival is celebrated in January mainly by Hindus from Southern India as a time for thanksgiving. In an early morning ritual in the homes of Hindus, rice is cooked in a new pot and allowed to boil over, symbolizing prosperity. Hindus who celebrate Pongal (PON-gal) prepare rice in the temples while prayers are chanted to the accompaniment of bells, drum beats, clarinets, and the blowing of large shells. After offering rice, vegetables, sugarcane, and spices with prayers to the gods, the people eat these foods to cleanse themselves of their sins.

Thanksgiving

Very old holidays often grow and change with the times. Our own Thanksgiving, originally a feast held to share and celebrate bountiful harvests, has expanded to include parades, football games and even the start of the winter holiday shopping season. In the United States, this holiday is celebrated on the fourth Thursday in November. Families gather to share a feast of roast turkey and other traditional foods that may vary depending on family favorites and the part of the country in which the family lives. In a similar way, Canada celebrates Thanksgiving on the second Monday in October. Their Thanksgiving or harvest festival is earlier than in the United States because Canadian harvests come earlier.

Labor Thanksgiving Day

In Japan, one of the most important harvests is the autumn rice crop. Long ago, none of the newly grown rice could be eaten until a ceremony had been held to honor the spirits thought to protect the crop. A procession and banquet were held, and at midnight the emperor of Japan took part in a ritual, presenting some of the harvest at a sacred altar. Today, the festival is a public holiday called Labor Thanksgiving Day, when people celebrate the success of both industry and farming in Japan.

American Indian Corn Dances

Corn played an important part in the lives of American Indians of the South, Central, and Northeastern United States. Not only was corn a staple for their diet in many delicious ways, but they used parts of the plant for making many necessary and useful items. Corn was so important that most American Indians had three major corn ceremonies; a planting ceremony, a harvest ceremony, and a feast of maize (corn). Some tribes, such as the Santo Domingo Pueblo in New Mexico, have similar celebrations today. Early in August, the American Indians of Santa Domingo hold a very large corn dance.

Materials Needed:

- Pictures or posters of people celebrating in various ways
- Special celebration items brought in by students and you
- Celebration Survey worksheet
- Tally and Frequency Chart

Procedure:

1. Bring things from home that represent celebrations to display.

Session One:

1. Divide students into small groups of four or five. Challenge the groups to list all the celebrations or holidays they can think of in five minutes. Then give them five more minutes to discuss:
 - a. how celebrations make you feel
 - b. what celebrations do you have in your family
 - c. some things your family does to make these celebrations special.
2. Invite the students to tell about the celebration items they brought. Ask:
 - a. What are some celebrations held in our community?
 - b. What activities do these celebrations include?
 - c. How and why do you think these celebrations got started? If we do not know, how can we find out?
 - d. Why do you think these celebrations are important?
3. Distribute the Celebration Survey sheet to individual students and ask them to write their two favorite celebrations or holidays, their favorite food associated with each celebration, and their favorite thing to do at each celebration. Then ask each student to predict what celebrations, foods and activities will most often be named as favorites by other students in the class. Students record their predictions on the Celebration Survey.
4. Have students share their choices within small groups. Each student adds the other students' choices to their Celebration Survey sheet.
5. Distribute and help students tally Our Group data on their groups' Tally and Frequency Chart sheet.
6. When all group data have been recorded in the tally column for the class, have groups copy all the tally marks onto their sheets and display on overhead.
7. Optional for older students: Have students use the percentage formula on the Tally and Frequency Chart to determine the percentage of students selecting each survey response and to display the top five CELEBRATIONS information on the first Histograms sheet.
8. Have students examine the frequencies (older students should also examine the percentages and histograms) to draw some conclusions. Ask:
 - a. Which celebration was chosen most often?
 - b. Which food do most students like best when we celebrate?
 - c. What is our favorite thing to do when we celebrate?
 - d. What are the top five favorite celebrations for our class?
 - e. What are the top five favorite celebration foods for our class?
 - f. What are the top five favorite celebration activities for our class?
 - g. How do our results compare with your predictions?
 - h. What celebrations do you predict adults will say are their favorites?
 - i. What foods do you predict adults will say are their favorites at celebrations?
 - j. What celebration activities do you predict adults will say are their favorites?

Session Two:

1. Encourage students to tell what they learned about the process of conducting a survey.
2. In small groups, have students tally adult survey data on their groups' Tally and Frequency Chart. Ask groups to select one person to transfer the adult data from their group to the adult tally column on the transparency of the Tally and Frequency Chart.
3. Optional for older students: Have students use the percentage formula on the Tally and Frequency Chart to determine the percentages of adults selecting each survey response and to display the top five CELEBRATIONS information on the second Histograms sheet. Have students write "Adult" on the blank line before each histogram. Repeat this process for FOODS and THINGS TO DO.

Session Three:

1. Discuss harvest festivals. Ask:
 - a. Why have harvests been something to celebrate through the ages and around the world?
 - b. What are some specific harvest and food festivals that people celebrate around the world?List the harvest festivals named by students in a visible place. Do not worry if the list is slim. This session is their chance to investigate more. (Possibilities include Kwanzaa, American Indian corn ceremonies, Thanksgiving, Sukkoth, local food festivals, county and state fairs.)
2. Have students form celebration (research) teams of a size that will work for their ages and abilities.
 - a. Explain that students will work together in small groups to research a harvest festival and share what they learn with the rest of the class during a classroom harvest festival celebration day. For example, the group studying Sukkoth could bring in lemons for ethrogs and build a miniature sukkath.
 - b. For presentations, discuss what information students want to know as a helpful guide for research and to build interest in celebration day presentations as a very special event. Will students make posters? Create dioramas? Give oral reports? Design displays? Make costumes? Play music? Serve traditional foods? Distribute recipes? Tell how the festival began? Teach games? Put up decorations or create props? Teach special customs associated with their harvest festival? Show on a map where the festival is celebrated?
 - c. For sources of information, encourage students to go beyond the encyclopedia with reference books (see Resources), the Internet, interviews with cultural groups or people who celebrate the festival, travel books and articles that talk about the festival, and specialty cookbooks that offer background information as well as recipes. Enlist the music teacher.

Session Four:

1. Celebrate! Have teams give their celebration presentations one at a time. If you have decided to make food a part of the festivities, you may want teams to arrange their foods buffet style and serve all foods at one time. You may want to include parent helpers to assist students.
2. Ask:
 - a. How are harvest festivals in various countries alike? How are they different?

(Compare and contrast the festivals presented by the teams, creating a chart if it seems helpful.)

- b. What new customs did you learn about that you would like to incorporate into your own holiday celebrations?

Extensions:

1. Use teams' written description and presentation of their celebration to assess their general understanding.
2. Evaluate quality and accuracy of data collection and analysis of histograms.
3. Have students write five reasons why people have celebrations and describe two ways people celebrate.
4. Have students name five harvest celebrations and tell why people celebrate harvests.
5. Have students write a description and illustrate a celebration that is important to them and their family.
6. Create a monthly classroom calendar focusing on various celebrations observed by members of the class. How does knowing one another's celebrations help us understand each other in better ways?
7. Have students write or verbally describe a celebration they actually attended that was special to them. What made it special?
8. Enjoy celebration music and dances from different cultures. Libraries generally have folk song and folk dance materials. Many music and tape stores have international music selections. Some families may have music to share. Play music tapes frequently. Challenge students to match a range of cultures with their music "by ear alone."
9. Challenge students to do some fun research on more celebrations and festivals. Include the obscure, the weird, the humorous. Chase's Calendar of Annual Events, a common reference in public libraries, can be a place to start. Share the results!

Resources:

Credit:

History of Fairs. International Association of Fairs and Expositions. PO Box 985, Springfield, MO 65801. 2002. <http://www.fairsandexpos.com>

Additional Resources:

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- Ingpen, Robert. A Celebration of Customs and Rituals of the World. Facts On File, Incorporated. 1996. ISBN: 0816034796.
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- Kapur, Sadhana. Pongol (Our Festivals). South Asia Books. 1999. ISBN: 8171815766.
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Educator's Notes:

CELEBRATION SURVEY

Name: _____

Directions

1. Use the My Favorites chart to list your two favorite celebrations, the food you like best at each celebration, and your favorite thing to do at each celebration.
2. Predict the favorite celebration, food and thing to do at a celebration for both students and adults and enter those predictions in the chart below.
3. Use the Other Students' Favorites chart to list what other students in your group chose as their favorites.
4. For homework, use the Adult Favorites chart to list what four adults tell you are their favorite celebrations, foods and things to do (activities).

MY FAVORITES

Person	Favorite CELEBRATIONS or special days	Favorite FOOD associated with celebration	Favorite THINGS TO DO at celebration
ME	1.	1.	1.
	2.	2.	2.

I PREDICT OTHER STUDENTS' FAVORITES ARE

Favorite CELEBRATIONS or special days	Favorite FOOD associated with celebration	Favorite THINGS TO DO at celebration

I PREDICT ADULT FAVORITES ARE

Favorite CELEBRATIONS or special days	Favorite FOOD associated with celebration	Favorite THINGS TO DO at celebration

CELEBRATION SURVEY (page 2)

OTHER STUDENTS' FAVORITES

Person	Favorite CELEBRATIONS or special days	Favorite FOOD associated with celebration	Favorite THINGS TO DO at celebration
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.

ADULT FAVORITES

Person	Favorite CELEBRATIONS or special days	Favorite FOOD associated with celebration	Favorite THINGS TO DO at celebration
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.
	1.	1.	1.
	2.	2.	2.

TALLY AND FREQUENCY CHART

Names: _____

Directions

1. Write all the different celebration choices for your group in the columns labeled **CELEBRATIONS**, **FOODS**, and **THINGS TO DO** (each of these has its own table).
2. Put a tally mark in the tally column for each person who chose the celebration, food, or things to do.
3. The total number of people from your group who were part of the survey: _____
4. Report the total number of people surveyed and your group tallies to your teacher when it is time to learn what others chose.
5. Using class data, write the number of people who picked each choice in the frequency column.
6. The total number of students who were part of the survey: _____
7. The total number of adults who were part of the survey: _____

Favorite CELEBRATIONS or special days	OUR GROUP	OUR CLASS			ADULT		
	Tally	Tally	Frequency	%	Tally	Frequency	%

8. **Optional:** Use this formula to calculate the percentage of people who made each choice.

$$\frac{\text{number of people in frequency column}}{\text{total number of people in the survey}} \times 100 = \text{_____} \%$$

Example: Valentine's Day was named by three students and 25 adults. There were 30 students in the survey and 100 adults. The percentage of students was: $\frac{3}{30} \times 100 = 10\%$

The percentage of adults who picked Valentine's Day was: $\frac{25}{100} \times 100 = 25\%$

9. Record the percentages in each percent column (Our Class, Adult).

TALLY AND FREQUENCY CHART (page 2)

Favorite FOODS associated with celebrations	OUR GROUP	OUR CLASS			ADULT		
	Tally	Tally	Frequency	%	Tally	Frequency	%

Favorite THINGS TO DO at celebrations	OUR GROUP	OUR CLASS			ADULT		
	Tally	Tally	Frequency	%	Tally	Frequency	%

HISTOGRAMS

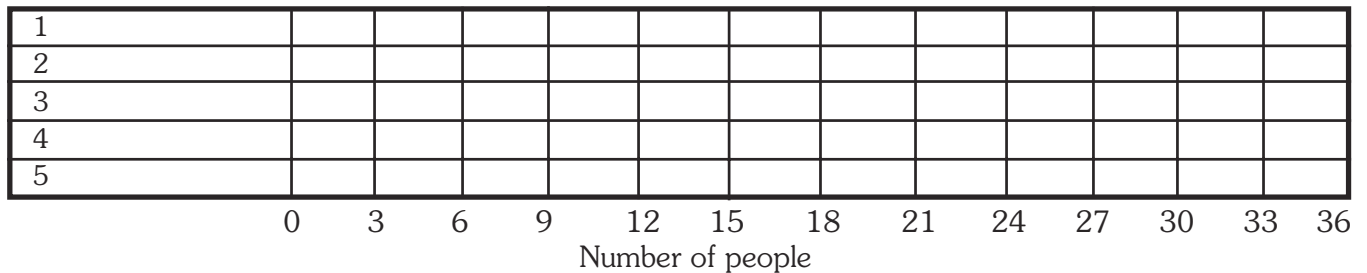
Names: _____

Directions

1. Use the **Tally and Frequency Chart** to identify the five most popular choices of students and adults.
2. There are three different Histogram descriptions: **CELEBRATIONS**, **FOODS**, and **THINGS TO DO**. Write "Student" or "Adult" on the blank line before each histogram to identify the type of information. List the top five choices in the left column for each histogram.
3. Shade in each row with a different color to show the frequency of the top five choices.

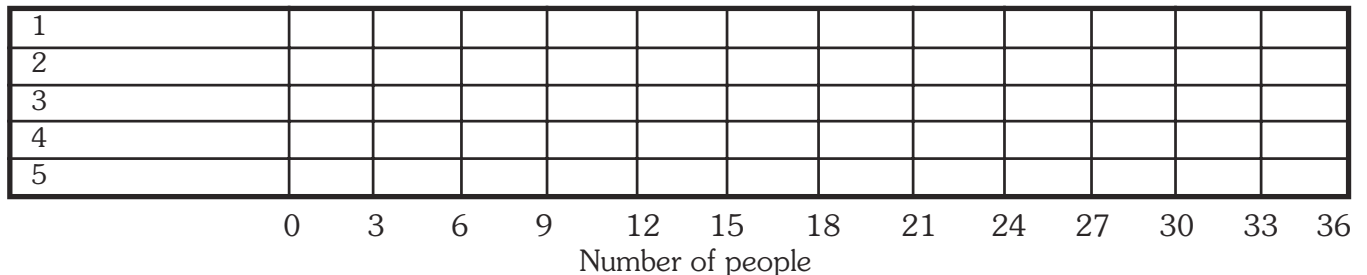
_____Histogram 1: Top five Favorite **CELEBRATIONS** or Special Days
(Student or Adult)

Top five choices



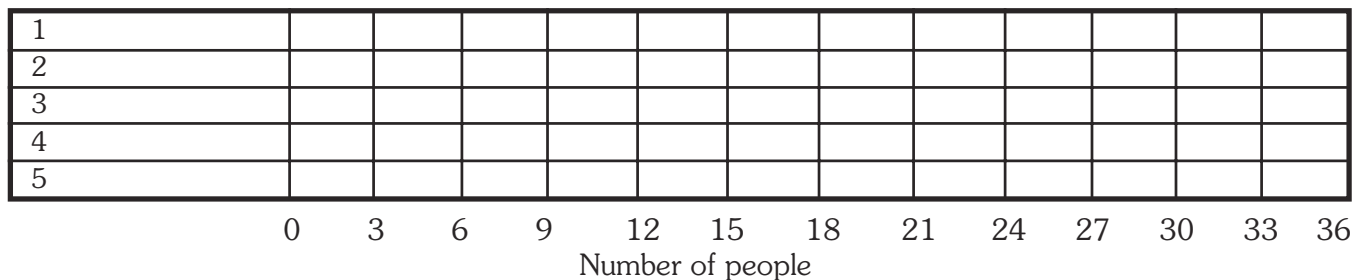
_____Histogram 2: Top five Favorite **FOODS** Associated with Celebrations
(Student or Adult)

Top five choices



_____ Histogram 3: Top five Favorite **THINGS TO DO** at Celebrations
(Student or Adult)

Top five choices





FROM FIELD TO FASHION

Math:

GLE 0506.5.1

Science:

GLE 0507.Inq.3

GLE 0507.Inq.6

Language Arts:

GLE 0501.4.2

GLE 0501.4.3

Social Studies:

2.01

2.02

2.03

2.04

2.03

5.2.01

BRIEF DESCRIPTION:

Students study clothing labels, research fabric production, and evaluate consumer options for their clothing.

LEVEL:

Fifth Grade

SUBJECT:

Math, Science, Language Arts, Social Studies

SKILLS:

Analyzing, brainstorming, collaborating, collecting data, comparing similarities and differences, constructing media, developing self-understanding, evaluating, generalizing, identifying, listing, observing, public speaking, recording, researching, sequencing, synthesizing, writing

OBJECTIVES:**The student will:**

- identify the origins and sources of some natural and synthetic fibers
- compare values, benefits, cost, care, and differences between natural and synthetic fibers
- generalize connections between fabric/clothing choices and renewable or nonrenewable resources
- identify how personal values influence decisions on the purchase of clothing
- identify careers associated with the clothing industry.

ESTIMATED TEACHING TIME:

45-60 minute sessions

Cotton T-shirts, woolen mittens, silk shirts, angora sweaters, down-filled vests. Do you think of these as connections between people, plants and animals? All the things we wear come from natural resources and include natural fibers such as down, fur, wool, cotton, and silk. They take us from fiber to fashion, with comfort, convenience and utility along the way.

Fiber is raw material that is long, strong and pliable enough to be spun into yarns and woven into fabrics. Fabric is determined by the fiber used and the weave or knitting technique. The same weave made using a different fiber will result in different characteristics in the fabric. Nature provides many different kinds of fibers that can be made into cloth. All the fibers gathered from plants and animals are called natural fibers. They have served people well for centuries.

Natural Fibers

A variety of animals provide natural fibers for cloth. Wool comes from sheep, llama, alpaca, guanaco, and vicuña. Angora rabbits provide angora and Angora goats provide mohair. Cashmere from Kashmir goats is another well-known clothing fiber. The large white moth caterpillar commonly called the silkworm provides the finest silk. The fur from such animals as mink, beaver, muskrats, and rabbits also can be found in clothing. Although leather is not a fiber, it is widely used as a fabric. Cattle hides are the source of most leathers.

Plants also give us natural fibers for fashions. The world's most important nonfood crop is cotton. So many things are made of cotton that it would be hard to go through a day without using or wearing cotton cloth. Cotton has been found in tombs in India dating back to 3000 B.C. Linen, made from fibers of the flax plant, is one of the world's oldest fabrics. Lesser known fibers such as ramie, jute, and hemp have many uses, varying from finely woven fabrics to rope.

Synthetic Fibers

Since the late 1800s people have had other fiber options from which to choose. Called synthetic fibers, these are man-made by chemists. They fall into two broad groups depending on where the fiber originated. One group of fabrics is made from natural fiber-forming materials such as cellulose. Cellulose comes from softwoods or the short fibers sticking to cotton seeds. Rayon and acetate are cellulose-based fabrics.

The second group of synthetics is formed chemically from by-products of the oil-refining process. These fibers can then be woven into cloth and are often mixed with natural fibers. They are resilient, although some are easily damaged by high temperatures. Petroleum-based fabrics include Kevlar®, nylon, polyester, acrylic, polypropylene olefin, and spandex.

All fibers - natural and synthetic - have one thing in common. All are made from natural resources. Natural resources are the materials provided by nature that can be used in production. Some natural resources are renewable because those resources are replenished by natural cycles. Fibers from trees, plants and animals are from renewable natural resources. Even the synthetic fiber rayon is made from a renewable natural resource, the plant product cellulose. But not all natural resources can be regenerated or replaced naturally within a reasonable amount of time. It would take millions of years to replenish our oil and petroleum reserves. Polyester, orlon, nylon, polypropylene, and spandex are made from oil and petroleum - nonrenewable natural resources.

It takes many steps and jobs to change the fiber to a fabric used to make clothing. For example, wool is first sheared from sheep. At a warehouse, wool is sorted by type and quality before it goes to the mill. In the mill, the wool is cleaned to remove dirt and grease. When the wool is clean, it can be dyed, if desired. It is then carded to remove tangles and any remaining dirt. Carding turns the wool into long, soft strands that are then spun into yarn. Wool yarn is woven on looms or knitted into fabric before it goes to the factory. At the factory, wool fabric is processed into clothing or household goods for shipment to stores where consumers can buy the finished product.

For wool or any fabric to be made into clothing, the fabric is sold to a clothing manufacturer. Clothing is designed and patterns are developed before the fabric is cut. The fabric is cut according to the pattern, sewn into a garment, and sold to stores. Finally, as the consumer, you buy the garment at the store - often after seeing some advertising.

Textile career choices involving producing and preparing clothing for the consumer may include agricultural producers (farmers and ranchers), plant and animal scientists, veterinarians, shearers, wool buyers, sorters, classers, carders, spinners, dyers, weavers, knitters, fabric designers, fabric buyers, clothes designers, pattern makers, seamstresses and tailors, store clothing buyers, advertising writers and artists, models and photographers, truckers, store stock people, salesclerks, and more.

Clothes, blankets, curtains, carpets, and coverings - all are made from textiles that are made by spinning and weaving natural or synthetic fibers.

Materials Needed:

- Encyclopedias
- Dictionaries
- Scissors
- Glue
- Magazines
- Newspaper clothing advertisements or clothing catalogs
- Cost sheet of dry cleaning
- Investigating Clothing worksheet
- Fibers and Fabrics cards
- From Fiber to Fashion worksheet
- My Choices worksheet

Procedure:

Session One:

1. Bring in a suitcase filled with clothing made from a wide selection of fabrics.
2. Predict the source of clothing.
3. Check out labels of students clothing for care instructions.
4. Distribute the Investigating Clothing worksheet to individual students. Tell students they will check out their own and each other's clothing - or the clothing from the suitcase - and record their findings on the sheet.
5. Discuss the various fabrics students discovered in their clothing. Use the questions below to create a summary chart in a visible place.
 - a. What kinds of fabrics did you discover? (List fabric types and care on your summary chart.
 - b. Identify resource base and whether renewable or nonrenewable.
 - c. What fabrics seem the hardest to take care of? (Some of the natural fibers such as linen, wool, and ramie.) The easiest? (synthetics) What generalizations can you make about fabric care? (In general, some of the natural fibers require the most care.) What kind of care do your favorite clothes require? (Answers may vary)
 - d. Which fabrics are cool? (Natural fibers that "breathe" or are loosely woven. Light colors don't absorb the sun's heat the way dark colors do.)
 - e. What kinds of fabric are made from renewable natural resources? (Wool, cotton, linen, jute, silk, ramie, rayon, and more.)
 - f. What kinds of fabrics are made from nonrenewable natural resources? (Polyester, nylon, orlon, and more.) From what are they made? (They are made from fibers that are chemically changed or produced from petroleum-based materials.

Session Two:

1. Divide students into small groups and distribute Fibers and Fabrics cards among the groups to determine what fibers are used to make the fabric, in which countries the fibers are grown or manufactured, the advantages and disadvantages of the fabric, and the steps and types of jobs necessary for the preparation of their fiber until it reaches the consumer as clothing. Ask students to include information about which fibers come from renewable and which come from nonrenewable resources and discuss the importance of this finding.
2. Have students compare the similarities and differences between the origin, steps, and types of jobs for each fabric. Ask the students to report their findings by answering these questions:

- a. What are some ways in which we can classify fibers? (Renewable and nonrenewable resource origins; natural fibers from plants, natural fibers from animals, man-made from nonrenewable resources, man-made from renewable resources, and more.)
- b. What processing steps are common among the fabrics researched?
- c. How do steps involved affect cost and availability of the fabric or finished goods? (For example, silk is labor intensive, so more expensive. Ramie is difficult to free from the gum, so not as abundantly available commercially.)
- d. What fabrics will keep you warm in cold weather? Cool in warm weather? What gives the fabrics those qualities?
- e. How are cloth and clothes related to natural resources? (They all are made from natural resources, whether natural or synthetic fibers.)
- f. How important is it to you if your clothes are made from one natural resource or another? Explain your answer.
- g. Why do we import clothes manufactured outside of the United States? How might this affect the cost? The quality?

Session Three:

1. Fill in From Fiber to Fashion worksheet together as a class.
2. Build consumer awareness by brainstorming to generate a list of things to consider before buying clothes. The list might include cost, durability or strength of fabric, care needed to keep the clothing neat and clean, season in which the clothing will be worn, kinds of activities for which the clothes will be worn, and more.
3. Build personal awareness by having students consider how personal values affect the clothes they buy. Distribute copies of My Choices to individual students to complete.

Extensions:

1. Have students create a Venn diagram and/or explain in writing three differences between natural and synthetic fabrics and tell the sources of at least five fibers (wool, cotton, nylon, silk, rayon, and so on).
2. Have students write a paragraph demonstrating the proper meaning of renewable and nonrenewable fabrics. How are they similar and different? How is your clothing connected to renewable and nonrenewable natural resources?
3. Have students write or name eight careers involved in the clothing industry.
4. Challenge students to design a garment or outfit they would choose for themselves, if possibilities were limitless. Have students design a logo/personal label for their line of clothing.
5. Have students market the product they designed.
6. Research the history of the garment industry in the United States and its relationship to labor unions and child-labor laws. What is a sweatshop? Why are some clothing companies moving their manufacturing plants outside of the United States? What feelings do people have about their clothing being made at the expense of child labor, with little regard for the environment, or by poorly paid workers?

Resources:

Books to accompany lesson

- Alter, Judith. Eli Whitney. Watts Franklin. 1990. ISBN: 0531108759 or Gaines, Ann Graham. Eli Whitney. Rourke Publishing, LLC. 2001. ISBN: 1589521773 or Latham, Jean Lee and Louis Cary. Eli Whitney Great Inventor. Main Line Book Company. 1991. ISBN: 0791014533 or Green, Constance McLaughlin. Eli Whitney and the Birth of

American Technology. Addison Wesley Longman, Inc. 1999. ISBN: 0673393380. Any of these are biographies discuss Eli Whitney's major influence in the development of industry. The invention of the cotton gin and application of standardized parts to the production of weapons and other machines stimulated the industrial revolution in the United States.

- Bader, Bonnie. *East Side Story*. Silver Moon Press. 1997. ISBN: 1881889718. A young girl and her older sister, working in the Triangle Shirtwaist factory (an early 20th century sweatshop on the Lower East Side of New York City), join a protest to improve their miserable working conditions.
- Brown, Rachel. *The Weaving, Spinning, and Dyeing Book*. Alfred A. Knopf. 1983. ISBN: 0394715950 or Keeler, Patricia and Francis X. McCall. *Unraveling Fibers*. Macmillan Publishing Company, Inc. 1995. ISBN: 0689317778 or Stoppleman, Monica and Carol Crowe- Carraco. *Fabric*. Crabtree Publishing Company. 1998. ISBN: 0865057893. Each of these books explores the process of producing fibers, spinning fiber into yarn, and weaving that yarn into fabric.
- Cole, Trish. *Why Do We Wear That?* Franklin Watts. 1996. ISBN: 0531143961 or Perl, Lila. *From Top Hats to Baseball Caps, From Bustles to Blue Jeans: Why We Dress the Way We Do*. Houghton Mifflin Company. 1993. ISBN: 0899199720. The types of clothing people have worn throughout history, why they dressed the way they did, and how clothing reflects and even influences history are discussed in both of these books.
- Currie, Stephen. *We Have Marched Together: The Working Children's Crusade*. Lerner Publishing Group. 1999. ISBN: 0822517337 or Freedman, Russell. *Kids at Work: Lewis Hines and the Crusade Against Child Labor*. Demco Media. 1998. ISBN: 0606135510. The crusade to end child labor is explored in these texts. Photos by Hines convinced people that the United States needed laws against child labor.
- Grimes, Nikki. *Aneesa Lee and the Weaver's Gift*. HarperCollins Children's Books. 1999. ISBN: 0688159974 or Roessel, Monty. *Songs from the Loom: A Navajo Girl Learns to Weave*. The Lerner Publishing Group. 1995. ISBN: 0822597128 or Sola, Michele and Jeffery Jay Foxx. *Angela Weaves a Dream: The Story of a Young Maya Artist*. Hyperion Books for Children. 1997. ISBN: 0786820608. Cultural aspects of making fabric are explored in these three explorations as each girl learns to produce fabric.
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- Weidt, Maryann. *Mr. Blue Jeans*. Lerner Publishing Group. Reprint Edition 1992. ISBN: 0876145888 or the Lerner Publishing Edition of the same book. 1991. ISBN: 0876144210. The life of Levi Strauss is traced in this story of the Jewish immigrant peddler who went on to found Levi Strauss & Co., the world's first and largest manufacturer of denim jeans.

Additional Resources

- Britton, Karen Gerhardt. *Bale O' Cotton: The Mechanical Art of Cotton Ginning*, Vol 43. Texas A & M University Press. 1992. ISBN: 0890965102.
- Duvall, Jill. *Ms. Moja Makes Beautiful Clothes*. Children's Press. 1997. ISBN: 0516203142.
- Hargrave, Harriet. *From Fiber to Fabric*. C & T Publishing. 1997. ISBN: 1571200258.
- Healy-Johnson, Guinevere and Nancy Shaw. *Wool*. The Creative Company. 1999. ISBN: 0886829658.
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- Kalman, Bobbie. *Hooray for Sheep Farming!* Crabtree Publishers. 1997. ISBN: 0865056552.
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- L'Hommedieu, Arthur John. *From Plant to Blue Jeans: A Photo Essay*. Children's Press. 1998. ISBN: 0516203665.
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- Mohair Council of America. 233 Twohig, P.O. Box 5337, San Angelo, TX 76902. (915) 655-3161. <http://www.mohair.com>
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- National Cotton Council of America. 1918 N Parkway, Memphis, TN 38112. (901) 274-9030. <http://www.cotton.org>
- Natural Fiber Research and Information Center, University of Texas at Austin, P.O. Box 8180, University Station, Austin, TX 78712. (512) 471-1616. <http://www.utexas.edu/depts/bbr/natfiber/>
- Parker, Julie. *All About Cotton: A Fabric Dictionary and Swatchbook*. Rain City Publishing. 1998. ISBN: 0963761234.
- Parker, Julie. *All About Wool: A Fabric Dictionary and Swatchbook*. Rain City Publishing. 1996. ISBN: 0963761226.
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Educator's Notes:

INVESTIGATING CLOTHING

Name: _____

Directions: Check out your own and your classmates' clothing to complete the chart. Try to find seven or more types of clothing fibers or contents.

Type of fabric and country where clothing was made	Wash and care instructions	Source of fiber		Natural resources made from	
		Natural	Synthetic	Renewable	Nonrenewable

Turn your paper over and design your own personal label logo.

FIBERS AND FABRICS

(Cut cards apart.)

Natural fibers from animals

Wool cloth is spun from yarn made from the fibers in the thick, spongy fleece of a sheep. Sheep's wool comes in shades of black, white and brown, and there are many different breeds of sheep. (Generally, only hand spinners keep, raise and shear colored sheep. Commercial wool producers discriminate against all but white sheep. Only white fleeces can be dyed.) Once a year sheep are brought to the barn to have their fleeces cut off or sheared. In five minutes the job is done and the sheared sheep are racing back to the field. Just like anyone's haircut, the sheep's hair grows back and needs cutting again. In the meantime, people put the valuable fibers to good use, spinning and weaving them into warm, absorbent, lightweight or heavy, beautifully dyed wool garments and more. All animal hair commonly used to make cloth is covered with scales and sucks up moisture. But the wool fibers from sheep can hold more water away from your skin than any other kind. When wearing a wool sweater, you feel warmer because your skin stays drier.



The Angora goat is another fiber provider. The white hair of Angora goats is called mohair. Mohair was produced exclusively in Turkey for thousands of years. Most of the Angora goats in the United States live on ranches in the hills of western Texas, where they thrive on the shrubs and grasses growing there. An Angora goat's mohair grows an inch each month. Most Angora goats are sheared twice a year; otherwise their locks would be too long for spinning mills to work with. Mohair is used in all the same ways as wool, but it is softer than wool and some people feel it is more comfortable to wear against the skin. As Angora goats grow older, their fleeces get rougher. These coarser fibers are used to make carpets and upholstery.

Cashmere from Kashmir goats, of northwest India/northeast Pakistan, is a well-known clothing fiber. It is used to make garments such as sweaters, dresses and scarves. Cashmere fabrics are luxurious in appearance, very soft, and provide warmth without weight.



The llama, alpaca, guanaco, and vicuña, all animals of the Andes region of South America, grow hair or fur coats of fiber that is woven into cloth. They are related to the camel, but are smaller and have no hump. People of the Andes cut the fleeces from these animals with large scissors. In other places it is gathered by brushing or shearing off the fibers with electric clippers. These animal-hair fibers, usually brown and occasionally black or white, are used for knitwear and for woven fabrics. Alpaca wool is of a higher quality than llama wool and is straighter and finer than sheep's wool. Llama and alpaca fibers are very thick and have hollow centers. The hollow fibers help keep bulky llama and alpaca clothes from feeling heavy and make warm clothing. Because of their warmth, these fibers are often made into outerwear such as sweaters, hats, scarves, and coats.

Angora rabbits provide some of the finest, lightest, and warmest of all fibers. They are named after a place in Turkey, where they came from hundreds of years ago. Today most Angora rabbits are raised in China and France. An Angora rabbit's hair is removed a little at a time, then spun into yarn and woven into fabric. One reason why angora is so warm is because it is so fluffy. The fluff leaves air spaces between the fibers that trap and hold in the warmth of your body.

Silk is produced mostly by moth caterpillars in building their cocoons, but the finest silk comes from the large white moth caterpillar commonly called the silkworm. The silkworm's cocoon, built with long, continuous fibers, is unwound to produce the fine threads used to weave silk cloth. Silkworms take a lot of care, and it takes many cocoons to make a significant amount of silk thread. This makes it expensive, but people prize silk for its smooth, shiny texture, its strength and light weight, and its ability to be dyed in an array of colors.

Fur is the soft, thick, hairy coat or the haired skin of a mammal. Most furbearers of commercial value (runk, beavers, muskrats, rabbits) have an undercoat of short, soft hairs (called fur fibers) and an outer coat of longer, smoother, stiffer hairs (called hair covering). Any article of wearing apparel that is made partly or entirely with fur is called a fur product. Furbie fabrics ("fake furs") are made from a combination of natural and synthetic fibers.

Although leather is not a fiber, it is widely used as a fabric. Cattle hides are the source of most leathers; deer, goat, pig, and sheep skins are also widely used. Leather is strong and durable and can be made as flexible as cloth or as stiff as wood. Because of this versatility it is used to make a wide variety of items including shoes, boots, belts, gloves, jackets, hats, shirts, slacks, purses, and suitcases. Baseballs and footballs have a leather covering. The United States is one of the largest producers of leather today.

FIBERS AND FABRICS (page 2)

(Cut cards apart.)

Natural fibers from plants



Cotton grows best where it stays warm and sunny for at least half the year. The United States is second only to China in raising cotton. Cotton is the number one commodity grown in Louisiana, second in Arizona, Texas, and Mississippi, third in Georgia and Tennessee, fourth in Alabama and Arkansas, and fifth in California and South Carolina. The fruit of the cotton plant is called a boll. Inside the boll, moist cotton fibers form around the 20 to 30 cottonseeds. When the fruit is ripe, the boll bursts open to show the cotton. After harvesting, cotton gins separate the cotton from the seeds and clean, dry, and bundle the fiber into heavy bales for shipment to mills. Here it is spun into yarn and woven or knit into cloth. More things are made of cotton than of any other fiber. Why? It costs less to harvest cotton fibers than most other fibers that are used to make cloth. Cotton is also absorbent, soft, lightweight, stretchy, and fast drying.

Linum, made from fibers of the flax plant, is another textile made from natural fibers. China, Belgium, and Ireland are big growers of flax. Linen is one of the world's oldest fabrics. Pieces of linen from Egypt indicate that people living there about 5000 B.C. wove fibers from the flax plant. Archaeologists have found Egyptian mummies, dating from the 2500s B.C., wrapped in linen. Because its fibers are so smooth and slick, linen does not shed much lint. For that reason, linen makes good dish towels. It also is used in clothing, table cloths, lace, twine, bags, and fire hoses. Linen retains its shape and is resistant to heat, moths and perspiration.



Jute is a natural plant fiber that has been grown in India since ancient times. Jute is used to make sacks, bags and carpet pads. It comes to us from the jute fibers harvested in the moist heat of Bangladesh, India and China. The long fibers are sent to a mill via truck, boat or concert. At the mill the jute fibers are made into cloth or rope. Jute fibers are plentiful and cheap. If you have not heard of jute before, perhaps it's because jute is made into things that are for usefulness rather than beauty.

Ramie (RAY me) is an ancient fiber-bearing plant that has been holding promise, but challenging people for centuries. Ramie fibers come from China grass. The raw fiber is coated with gum that must be removed. For ages, removing the gum without damaging the fiber has been the bottleneck for using ramie. Degumming methods vary, but generally require several steps, subjecting the fibers to heat, chemicals, crushing, washing, and drying. The ramie plant has more uses than the other fiber plants, and is reportedly twice as strong as flax and seven times as strong as wool, so experts are working hard for a solution. There are several reasons why some say ramie may be the crop of the future: sources of supply of the materials (cellulose and petroleum) for rayon and other synthetics are being gradually used up; land planted in cotton is on the decrease; supply of linen fabrics is not keeping up with demand; and our increasing dependence on foreign countries for wool. Ramie produces finely woven fabrics. It also is used to make rope, and it's said that the Bank of France even used it for banknotes of superior quality. Because of its fineness, luster, durability, and strength, the demand for ramie is great. It blends well with fibers such as cotton, wool, linen, silk, rayon, and others. It can be spun and woven on the same equipment, thus adding to the beauty and value of those fabrics. Still, to grow and prepare ramie for spinners remains the challenge. It will be a while before ramie can be produced in large commercial amounts. For now, Florida-grown ramie is second to none, and its cultivation and harvest is being studied by scientists.

The hemp plant is grown for its strong, durable fiber. The plant's slender woody stalks are hollow except at the top and base. Hemp fibers come from the inner bark of the stalk and are used to make ropes, cords, string, twines, and coarse fabrics such as sackcloth and canvas. In Italy, it is used to make a fabric similar to linen. Hemp was cultivated in China as early as 2800 B.C. It is native to central and western Asia and was once grown in many temperate and tropical regions worldwide. The plant became less important after development of synthetic fibers as strong as or stronger than hemp fibers. Hemp is still grown for its fiber in some countries. Because two illegal drugs can be obtained from hemp plants, cultivation in the United States requires a government permit.

FIBERS AND FABRICS (page 3)

{Cut cards apart.}



Synthetic fibers

Rayon, originally called artificial silk or poor-man's silk, was an attempt in the late 1800s to produce silk chemically. It was first commercially produced in the United States in 1910. The name changed from artificial silk to rayon in 1924, the word *ray* indicating the sheen (bright, shiny) of the fiber and *on* indicating a cottonlike fiber. Rayon can be found in dresses, suits and lingerie. Because of its strength and durability, it is also used in automobile tire cords, upholstery, and scatter rugs.

Acetate fiber (also called cellulose acetate) was first produced in large quantities in 1921. It feels softer than rayon, but is not as strong or as absorbent.

Kevlar® is a strong, heat resistant, chemically-formed synthetic fiber. Many firefighters wear coats containing Kevlar® to protect them from high temperatures during firefighting. Race-car drivers wear jumpsuits made with Kevlar® to protect them in case of fiery crashes. And police officers often wear bullet-resistant vests lined with layers of tough Kevlar® cloth.



Nylon is the synthetic fiber produced in the largest quantities and is probably the most versatile of all the synthetics. It was first produced commercially in large quantities in 1939-1940. Nylon is very strong, can withstand abrasion, and keeps its shape. It is used in fabrics designed for nearly all kinds of apparel, furnishings, and industrial purposes. Wash-and-wear fabrics made with nylon or other synthetic fibers dry faster than those made with natural or cellulose-based synthetic fibers (rayon, acetate). Nylon is resistant to mildew, moths and perspiration.

One of the most important and widely produced polyesters is polyethylene terephthalate (PETE). It can be spun into fiber, made into film, or combined with other materials and molded into plastic parts. PETE is probably best known for its use in plastics, but it also can be found in clothing and automobile tire cords. Polyester fibers include Dacron®, Fortrel, and Kodel. Polyesters are extremely strong and durable and are popular in apparel fabrics, soft carpets, and industrial fabrics. Clothing fabrics are often made from a blend of polyester and cotton fibers. The polyester fibers provide the wash-and-wear quality and the cotton fabric makes them comfortable to wear. Polyester is resistant to abrasion, wrinkling, sunlight, mildew, moths, and perspiration.

Acrylic fibers possess a unique woollike feel. They are very strong and show little damage from sunlight and many chemicals. They can be found in dresses, suits, sweaters, blankets, carpets, and fur-like fabrics. Orlon is an acrylic fiber and is soft and durable.

Polypropylene olefin fibers are the lightest weight of all synthetic fibers. They are strong and resist stains (fibers absorb almost no moisture) and are used in carpets, upholstery, and ropes. Their use in clothing is limited by poor dyeability and low melting temperature. Polypropylene retains its shape and is resistant to abrasion, chemicals, and mildew.

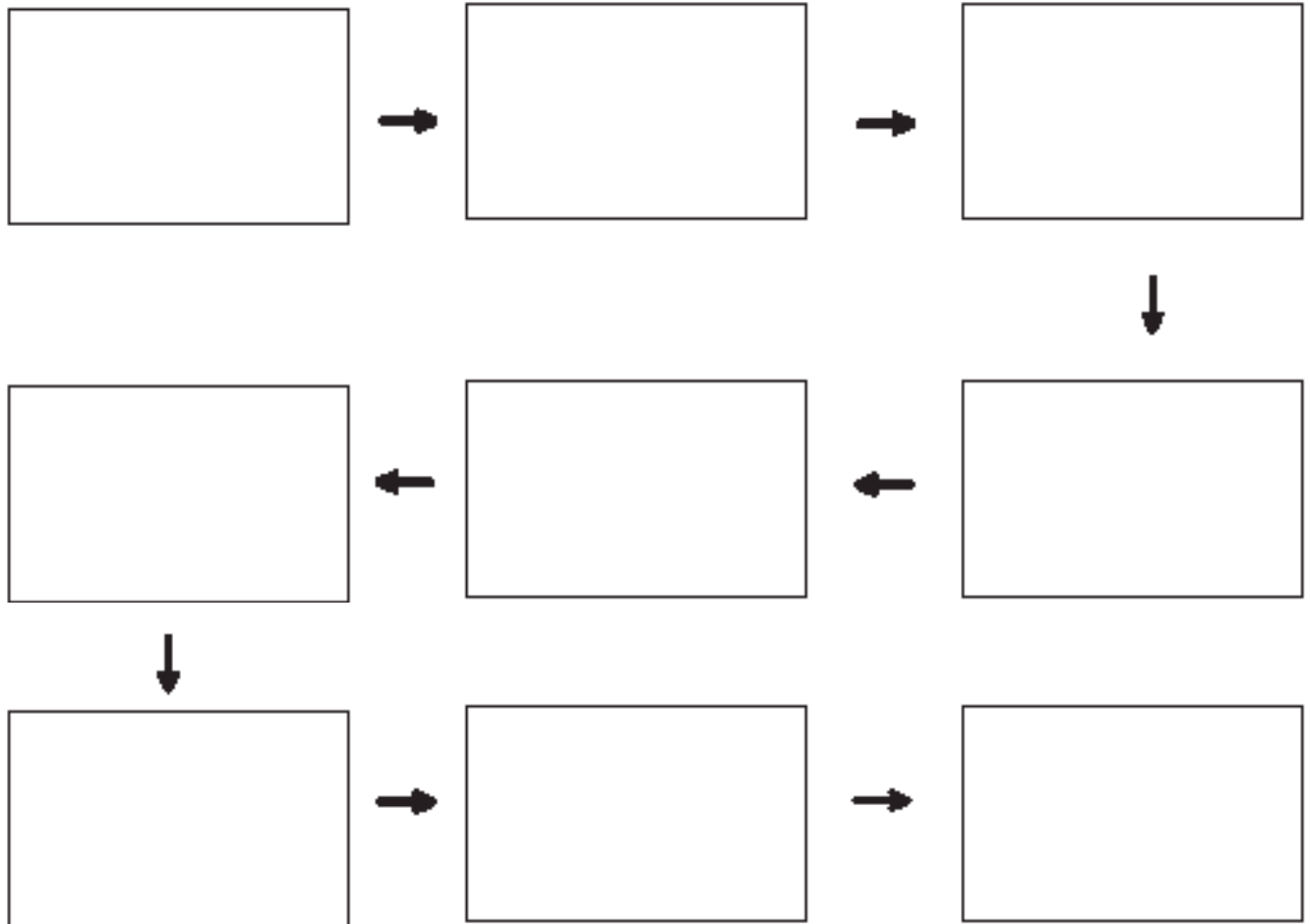
Spandex fibers are resistant to body oils and they keep their elasticity after repeated washings. These synthetic fibers are used in foundation garments, bathing suits, and support stockings.

FROM FIBER TO FASHION

Name: _____

Directions: Draw or use words to show the steps and jobs needed to make a fiber into clothing. Use and/or add as many boxes as you need.

FIBER: _____



Write all the jobs identified from the above steps on these lines.

- | | | |
|----------|-----------|-----------|
| 1. _____ | 7. _____ | 13. _____ |
| 2. _____ | 8. _____ | 14. _____ |
| 3. _____ | 9. _____ | 15. _____ |
| 4. _____ | 10. _____ | 16. _____ |
| 5. _____ | 11. _____ | 17. _____ |
| 6. _____ | 12. _____ | 18. _____ |

MY CHOICES

Name: _____

I. Directions: Read each statement and check your response in the appropriate box.

Statement	Yes	Sometimes	No	Not Sure
1. Clothes with designer labels are important to me even though they cost more.				
2. I know clothes that have to be dry-cleaned will cost extra money, but I am willing to pay the difference.				
3. I feel that discount and outlet stores are good places to shop for clothes.				
4. I prefer to buy such natural fabrics as cotton and wool because they are from renewable resources.				
5. It is important to me to have the most current fashions.				
6. Shopping at a secondhand store is okay because it's a good way to save money.				
7. When I buy something I wear over and over again, it's okay to spend more money if it means higher quality.				
8. If something is made better and will last longer, I am willing to pay more for it.				
9. Shopping carefully to get a good value at less money is worth it because it gives me more money to spend on something else.				

II. Directions: Complete these statements in your small group. All groups should be prepared to share their responses with the class.

1. Three ways in which understanding my values about clothing can help me make better buying decisions are:

1. _____

2. _____

3. _____

2. Times when paying more for something makes good sense are:

3. Times when paying less for something makes good sense are:



GLOBAL GROCERIES

Math:

1.2

1.3

Science (Health):

5.1

5.2

Language Arts:

2.08

2.09

Social Studies:

2.02

2.03

2.04

BRIEF DESCRIPTION:

This lesson is "disguised" as a game, which teaches valuable concepts within international trade and nutrition. Within this lesson, the USDA Food Guide Pyramid is introduced and examples of local and non-local food are identified. The students engage in trading food cards in order to meet nutritional needs. The trading game demonstrates how limited resources (to produce food) lead to a food imbalance or the need to buy/sell agricultural products. During the trading, the students utilize problem solving skills and basic mathematic calculations.

LEVEL:

Fifth Grade

SUBJECT:

Math, Science, Language Arts, Social Studies

SKILLS:

Analyzing, brainstorming, collaborating, collecting data, comparing similarities and differences, constructing media, developing self-understanding, evaluating, generalizing, identifying, listing, observing, public speaking, recording, researching, sequencing, synthesizing, writing

OBJECTIVES:

The student will:

- identify local and non-local agricultural commodities
- inventory the various USDA food groups
- understand that limited resources or access to resources lead to nutritional imbalances or food exchange

ESTIMATED TEACHING TIME:

45 minutes

Global Groceries

Materials Needed:

- Activity worksheet
- Trading cards

Procedure:

1. Ask your students to bring their favorite foods to class. Focus on the origin of the food product. Make note that the origin may change throughout the year depending on the varying growing seasons.
2. Discuss the concepts of importing, exporting, and international trading. For such concepts, you may want to talk about how we can buy (from the grocery store) strawberries and sweet corn in the winter. Talk about the reasons why your state does not produce all of the food products that were brought to class. At this time, you may also want to ask how people saved food for the winter months when they simply could not buy them at a store.
3. Present the USDA Food Guide Pyramid and the six food groups. List several different kinds of foods and ask your students to which group they belong. Finally, use this information on international trading and nutritional requirements to play the food card game.

4. Depending on the number of students in your class, you will need to count the food cards differently. The table below provides the card counts for the class divided into three and five groups.

Food Groups	3 Groups # of cards	5 Groups # of cards
Grains	18	30
Vegetables	9	15
Fruits	6	10
Milk	6	10
Meat & Beans	6	10
Oils	3	5

5. Ask students:
- What is the difference between importing and exporting?
 - Based on the Food Guide Pyramid, which of the food groups should be consumed sparingly?
 - How can you eat more fruits and vegetables to fulfill your daily requirements?

Extensions :

Work with your school cafeteria to offer more fruits, vegetables, and whole grains during school meals and events.

Resources:

- Food Guide Pyramid and nutrition information are available from USDA, <http://www.mypyramid.gov>
- American Agricultural Economics Association, <http://www.aaea.org>
- National Agri-Marketing Association, <http://www.nama.org>

Global Groceries

International Trade Activity



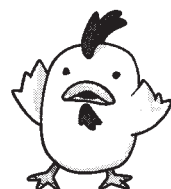
Name: _____

Date: _____

Overview: You will explore international trading (importing and exporting) of agricultural commodities in order to satisfy nutritional standards set forth by the USDA Food Guide Pyramid.

Remember the last time you looked inside your kitchen cupboards or refrigerator. What did you see? You most likely found food products from all over the United States and the rest of the world. Although agriculture is a top industry, each state does not produce all the food products that we typically consume.

1. List three agricultural commodities produced in your state:



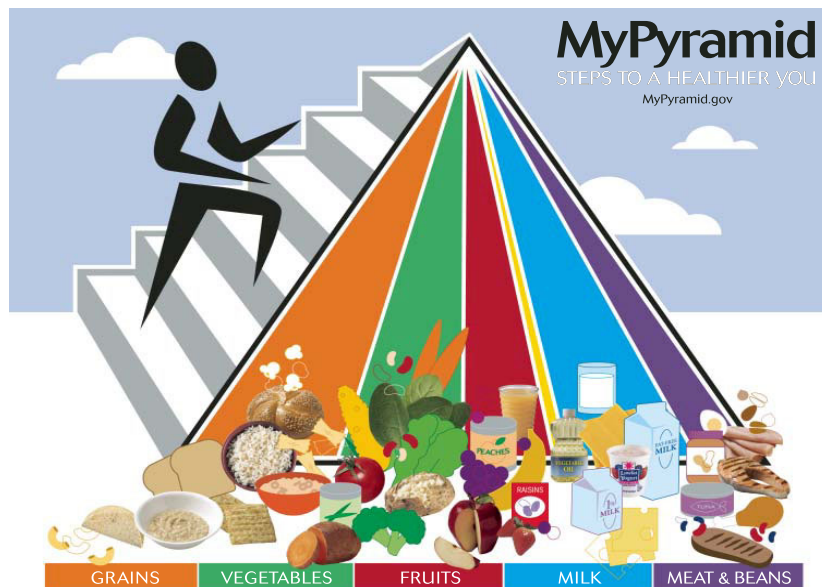
2. List three agricultural products from the United States that are consumed in your state, but *not* grown in your state:



3. List three agricultural products that are typically grown outside of the United States and consumed in your state:



Agricultural commodities, like Kenyan coffee or Costa Rican bananas, are imported into The United States. On the other hand, the United States exports grains like wheat and corn, along with processed food products, like soft drinks, to Asia, Europe, Canada, and Mexico. International trade occurs through importing and exporting of agricultural products between countries. Such trade allows consumers to eat various foods that (1) are not produced in their region or (2) are past the local growing season.



We consume such products everyday, like fruits, vegetables, bread, cheese, and meat. The United States Department of Agriculture (USDA) has established guidelines for daily consumption in order to meet the needs of the human body. These guidelines are separated by food group and arranged in a pyramid (diagrams courtesy of www.mypyramid.gov).

GRAINS Make half your grains whole	VEGETABLES Vary your veggies	FRUITS Focus on fruits	MILK Get your calcium-rich foods	MEAT & BEANS Go lean with protein
<p>Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day</p> <p>1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or 1/2 cup of cooked rice, cereal, or pasta</p>	<p>Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens</p> <p>Eat more orange vegetables like carrots and sweetpotatoes</p> <p>Eat more dry beans and peas like pinto beans, kidney beans, and lentils</p>	<p>Eat a variety of fruit</p> <p>Choose fresh, frozen, canned, or dried fruit</p> <p>Go easy on fruit juices</p>	<p>Go low-fat or fat-free when you choose milk, yogurt, and other milk products</p> <p>If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages</p>	<p>Choose low-fat or lean meats and poultry</p> <p>Bake it, broil it, or grill it</p> <p>Vary your protein routine — choose more fish, beans, peas, nuts, and seeds</p>
For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov .				
Eat 6 oz. every day	Eat 2 1/2 cups every day	Eat 2 cups every day	Get 3 cups every day; for kids aged 2 to 8, it's 2	Eat 5 1/2 oz. every day
Find your balance between food and physical activity <ul style="list-style-type: none"> Be sure to stay within your daily calorie needs. Be physically active for at least 30 minutes most days of the week. About 60 minutes a day of physical activity may be needed to prevent weight gain. For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required. Children and teenagers should be physically active for 60 minutes every day, or most days. 		Know the limits on fats, sugars, and salt (sodium) <ul style="list-style-type: none"> Make most of your fat sources from fish, nuts, and vegetable oils. Limit solid fats like butter, margarine, shortening, and lard, as well as foods that contain these. Check the Nutrition Facts label to keep saturated fats, trans fats, and sodium low. Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients. 		



U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005
CNPP-15



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There are six food groups: grains, vegetables, fruits, milk, meat & beans, and oils. The correct balance of the different food groups provides the necessary energy, vitamins, fiber, protein, calcium, and other nutrients to keep our bodies healthy.

However, not every state or country can produce the various foods necessary to have a balanced diet, which may be due to many factors, like the differences in climate, technology, infrastructure, or cultural practices. We will now apply such concepts of international trade, importing, exporting, and food guidelines in this activity.

4. Based on the USDA Food Guide Pyramid diagram, what are the daily minimum servings for the following food groups:

Milk _____

Meat & Beans _____

Vegetables _____

Grains _____

Fruits _____

- The goal for this activity is to obtain the minimum daily food group servings. This goal will be achieved by trading food cards in equal amounts among the other "countries". Divide the class into countries.

5. List the names of your fellow "citizens" (group members).

_____	_____
_____	_____
_____	_____

6. As a group, decide upon which country you represent: _____

Your country is located within which continent? _____

What are the names of the other countries in your class?

_____	_____
_____	_____
_____	_____

- Each country will draw food cards one at a time from the stack. Look at the amount. Continue to draw food cards until the total amount is \$290. If your last draw causes a total amount more than \$290, you must return the last drawn card to the bottom of the stack and continue to draw until your country reaches \$290 exactly.

7. Looking at your country's drawn food cards, which food groups do you need more servings to meet the pyramid guidelines? *In other words, which food groups will your country import?*

8. Likewise, which food groups do you have in excess? *In other words, which food groups will your country export?*

Place your country's export food cards, facing-up, in the center. Keep in mind that your export food cards are another country's import food cards! Begin the international trading by alphabetical order of the country names and in turns. State which food group your country would like to import and which food group you can export. **All trades must be of equal value.** For example, a country can import 2 vegetable cards @ \$10 each by exporting 1 fruit card @ \$20 each. Continue trading until one country has all of the food cards required to meet the minimum guidelines of the food pyramid.

9. In a paragraph, explain at least three reasons why a state, region, or country may not be able to meet their nutritional needs:

10. What would you expect to happen if you needed two more milk cards but no one had any extra milk cards to trade with you?



If you enjoyed this activity, you may want to consider a CAREER in **AGRICULTURAL ECONOMICS, MARKETING, and SALES**. Informed decision making is central to these careers. People in these related careers develop market plans, coordinate production schedules, use management tools, forecast prices, identify and expand markets, determine customer needs, buy/sell/trade commodities, and advise other agricultural professionals from the producer to the wholesaler and retailer.

11. Using the career responsibilities listed above, what are four personal qualities of someone who excels in agricultural economics, marketing, or sales?

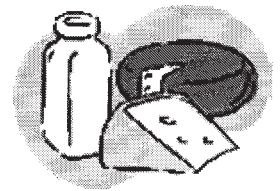




1 Serving
Milk
\$5



1 Serving
Milk
\$5



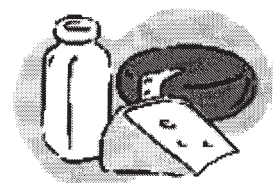
1 Serving
Milk
\$5



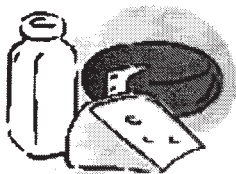
1 Serving
Milk
\$5



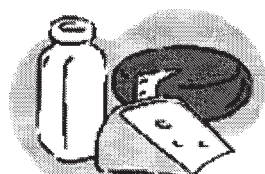
1 Serving
Milk
\$5



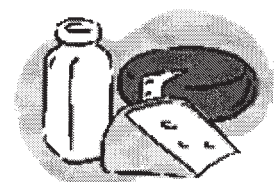
1 Serving
Milk
\$5



1 Serving
Milk
\$5



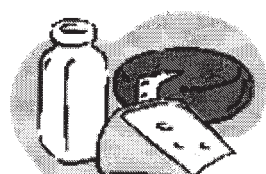
1 Serving
Milk
\$5



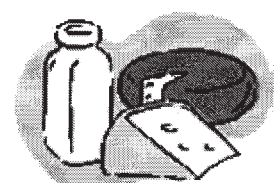
1 Serving
Milk
\$5



1 Serving
Milk
\$5



1 Serving
Milk
\$5



1 Serving
Milk
\$5



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



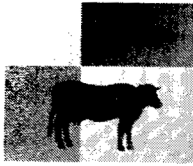
1 Serving
Vegetables
\$10



1 Serving
Vegetables
\$10



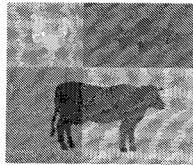
1 Serving
Vegetables
\$10



1 Serving

Meat & Beans

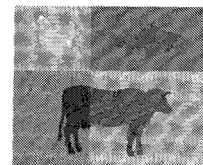
\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

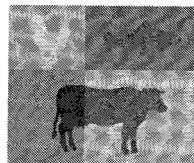
\$15



1 Serving

Meat & Beans

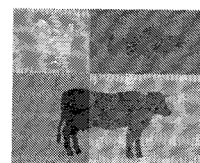
\$15



1 Serving

Meat & Beans

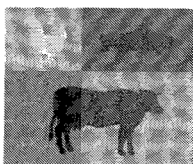
\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

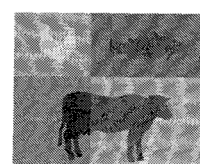
\$15



1 Serving

Meat & Beans

\$15



1 Serving

Meat & Beans

\$15



1 Serving
Fruits

\$20



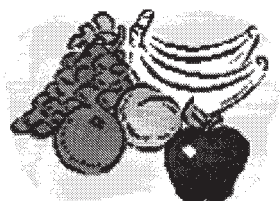
1 Serving
Fruits

\$20



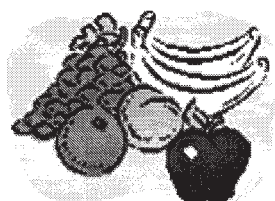
1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



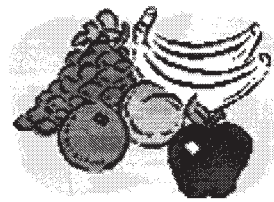
1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



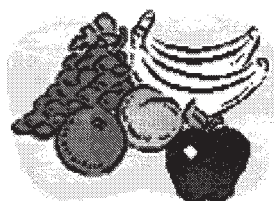
1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



1 Serving
Fruits

\$20



1 Serving

Grains

\$25



1 Serving

Grains

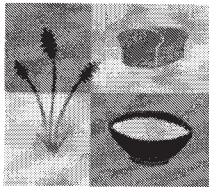
\$25



1 Serving

Grains

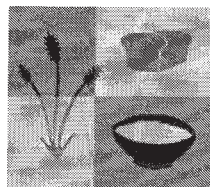
\$25



1 Serving

Grains

\$25



1 Serving

Grains

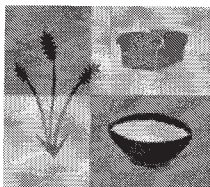
\$25



1 Serving

Grains

\$25



1 Serving

Grains

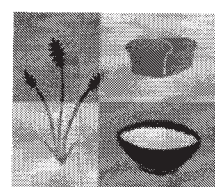
\$25



1 Serving

Grains

\$25



1 Serving

Grains

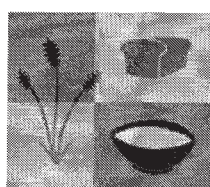
\$25



1 Serving

Grains

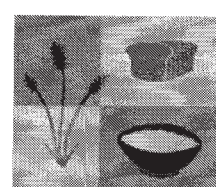
\$25



1 Serving

Grains

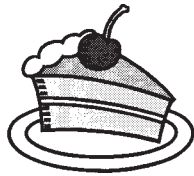
\$25



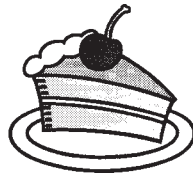
1 Serving

Grains

\$25



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



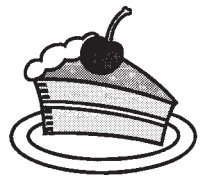
1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



1 Serving
Oils
\$30



THE FARMER CARES FOR THE LAND

Math:

GLE 0506.5.1

Science:

GLE 0507.Inq.3

GLE 0507.2.3

Social Studies:

5.3.02

Language Arts:

GLE 05010.3.5

GLE 0501.3.5

GLE 0501.4.2

BRIEF DESCRIPTION:

The student will learn the importance of soil, water, air and solar energy to the agriculture industry and the interrelationship of agriculture with the environment. The student will identify cause and effect relationships in issues relating to agriculture and the environment.

LEVEL:

Fifth Grade

SUBJECT:

Math, Science, Language Arts, Social Studies

SKILLS:

Analyzing, brainstorming, collaborating, collecting data, comparing similarities and differences, identifying, recording, synthesizing, writing

OBJECTIVES:

The student will:

- identify cause and effect
- compare and contrast
- identify the problem
- identify the solution
-

ESTIMATED TEACHING TIME:

45 minutes

Farmers care about the environment. The land is their livelihood. Most people, farmers included, try to avoid practices which might harm or destroy their way of life. Despite this fact, agriculture is blamed for many environmental problems.

People began polluting long before they knew that was what they were doing. Early settlers in this country dumped their trash into rivers and streams without considering the harm it might do. Before gasoline-powered tractors began releasing exhaust fumes into the rural countryside, work horses were creating pollution problems of their own. The average farm horse produced 35 pounds of manure or solid waste and two gallons of liquid waste each day. Although horse manure can be an excellent fertilizer when spread across a field, large amounts in small areas can create high concentrations of nitrogen and bacteria which may filter through the soil into the underground water supply.

Thousands of years ago people began to farm because they found they could produce more food that way than they could by hunting and gathering. Over the years people discovered that some farming practices hurt the land. Cutting down trees, clearing away vegetation and letting animals overgraze left topsoil unprotected so winds and water could erode it away. Planting the same crop on the same field year after year used up all its nutrients. As a result, the fields lost their ability to produce good crops.

Early farmers learned from their mistakes and developed better farming methods. They learned to farm on the contour and build terraces-ridges of soil built across the slope to slow the runoff of water. They learned to rotate their crops-move them from one field to another to let the land rest. They learned to spread animal manure on their fields to restore organic matter and nutrients.

When European settlers came to the New World, they were dazzled by what seemed like endless resources-acres and acres of rich soil which had never been used for farming. Many farmers abandoned the methods their ancestors had learned for protecting the land. When one field began to produce poor crops, the farmer would simply abandon it and move farther into the wilderness.

As more people moved in, they began farming sloping lands that could easily wash away and sandy soils that could easily blow away. In the early 20th Century, farmers began plowing up the native grasses of the Southern Plains to plant wheat. Since that land had never been farmed before, farmers had no way of knowing that their hard work would be the first step toward creating what came to be known as the Dust Bowl. A severe drought dried up the exposed soil. With no grass roots to hold the sandy soil in place, it simply blew away with the strong summer winds.

Recognizing a problem is the first step toward solving it. Farmers didn't know plowing up the Plains would cause the soil to blow away. Once they saw what had happened, they did what farmers have been doing for thousands of years. They began thinking of different farming methods they could use that would protect the soil.

One method involved using chemicals on weeds instead of turning the soil with a plow. For many years, this method seemed like an excellent way to keep the soil in place while producing the food people needed. Then scientists discovered the chemicals were getting into the water supply and making birds, fish, animals and people sick. Today farmers and agricultural researchers are working on ways to solve that problem and many more.

Resources:

Books to accompany lesson

- George, Jean Craighead, *Who Really Killed Cock Robin: An Ecological Mystery*, Harper Collins, 1991.
- Pollock, Steve, *Ecology*, Eyewitness Science, Dorling Kindersley , 1993.

Additional resources to accompany lesson

- "How You Can Help Save the Environment," Society of American Foresters, 5400 Grosvenor Lane, Bethesda, MD 20814 (bookmark/flyer for students in grades 4-6 listing things people can do to conserve natural resources and help the environment, 10 cents each.)
- "Things We Can Learn From a Cow and a Worm," National Cattlemen's Beef Association, Education Dept., 444 N. Michigan Ave., Chicago, IL 60611, 1-800-368-3138 (22- by 34-inch educational poster with activities demonstrating the positive role ruminants, especially cattle, play in our environment. Earthworms are featured as an example of natural recycling, code # 17-5 17, \$1 SO).

Materials Needed:

- The Farmer Cares for the Land - Wetlands worksheet
- The Farmer Cares for the Land - Soil Erosion worksheet
- The Farmer Cares for the Land - Chemical Pesticides and Fertilizers worksheet

Procedure:

1. Ask students to describe what farmers do. Then ask students to define the word "environmentalist." Ask students if they have heard any news reports about conflicts between farmers and environmentalists (endangered species, grazing on public lands, wetlands). Draw a Venn diagram on the chalkboard, and ask students to list things on which farmers and environmentalists disagree and things they have in common. (Both care about the land. Both need food to eat.)
2. Share background material and discuss problem/solution and cause/effect relationships.
3. Divide the class into three groups. Assign each group one of the worksheets. Have students read the situations on the student worksheets and identify the cause and effect and the problem and solution in each one. Students should also identify the alternatives and their effects.
4. Were students able to identify cause/effect and problem/solution relationships? Were students able to understand the complexity of the farmer's challenge?

Extensions:

Have students search current newspapers and magazines for issues having to do with conflicts between agriculture and environmentalists (wetlands, endangered species, etc .) Lead a discussion on the conflicts between individual rights and the common good (i.e. the individual rights of people who want to smoke in public places conflict with the need to protect the public from second-hand smoke). Lead the discussion toward the individual right of the farmer to use his or her land to make a living in conflict with the public need to protect the environment. Make sure students also recognize the common good that comes from having a safe, inexpensive and abundant food supply and that individual rights sometimes work toward the common good (i.e. the public benefits if the farmer is able to earn a living by producing food).

Name _____

The Farmer Cares For the Land

Identify the problem and the solution and the main cause and effect relationship in the information below.

Wetlands

Wetlands are low areas that are saturated with water. Marshes and swamps are wetlands. Most of the wetlands in Oklahoma are the areas along creeks and rivers, between the water and the land. These are called **riparian areas**. Oklahoma has some marsh and swamp areas, too, mostly in southeastern Oklahoma.

Wetlands are an important part of the earth's ecosystem. They act like sponges to store water during the wet times of the year and release it into the aquifers and underground streams where we get most of our drinking water. When there are no wetlands to soak up the water, rains are more likely to turn into floods which destroy homes, businesses and farms. Plants that grow in wetlands hold the soil and help keep it from being washed away.

Wetlands also help purify water. They filter out harmful chemicals and wastes. Dirty water gets a good cleaning when it flows through a wetland.

Wetlands provide homes for many birds and animals that need wet places to grow and reproduce. They are important rest and food stops for many migrating birds. Many endangered plants and over $\frac{1}{3}$ of our endangered animals live in or use wetlands.

At the time of European settlement, there were about 215 million acres of wetlands in the lower 48 states. In the last 200 years over 54 percent of these wetlands have been lost. Most were converted to agricultural uses. For many years people thought of wetlands as obstacles to farming and breeding grounds for mosquitoes. The government even encouraged landowners to turn wetlands into dry lands.

Now we know more about wetlands. We realize how much they help the environment, wildlife and humans. Federal laws have been passed to protect and preserve them. Some people don't like the wetland laws. People who have wetlands on their property think they should be able to use their property to earn money to support their families.

Problem	
Solution	
Cause	
Effect(s)	

Does the solution create another problem? If so, what is it? _____

Name_____

The Farmer Cares For the Land B

Identify the problem and the solution and the main cause and effect relationship in the information below.

Soil Erosion

Soil erosion is what happens when soil is washed or blown away. In most places, trees, grass and other plants hold soil in place. When that vegetation is removed, winds and rains can carry the soil away. Over the years, farmers have removed unwanted grass, weeds and other vegetation from soil before planting their crops. Cattle and other farm animals can also remove all the vegetation from an area if there are too many or if they are left in one place for too long. Once gone, soil is not likely to be replaced within our lifetime or within several generations.

On the Southern Plains, the soil is sandy; annual rainfall is low; there are large, open areas; and high winds are common. The first white settlers allowed their livestock to roam and graze the Plains until there was very little vegetation left to hold the soil in place. Early in the 20th century, farmers plowed up the natural grass cover on the Plains and planted **winter wheat**. Between 1934 and 1937, the area had even less rainfall than usual. With large areas of plowed land having no grass root system to anchor it, much of the soil blew away. The dust storms and sand storms buried roads and houses. Clouds of dust reached as far east as Washington, DC.

In response to the disaster, the federal government created the Soil Erosion Service and the Civilian Conservation Corps to find ways to recover the land. Workers replanted grass, planted trees and showed farmers scientific agricultural methods to help them protect the soil.

One method was to put large numbers of animals out to graze on one piece of land for a short period of time and then move them to a new pasture. This allowed the animals to get the nutrition they needed while cutting down on overgrazing and erosion.

Another method was no-till farming. A farmer using this method planted crops directly in the plant stems, stalks and leaves from the last harvest. For this method to work, the farmer must use herbicide to kill unwanted grass and weeds. This method helps stop soil erosion, but some people worry that the herbicides used might pollute the underground water supply.

Problem	
Solution	
Cause	
Effect(s)	

Does the solution create another problem? If so, what is it? _____

Name _____

The Farmer Cares For the Land

Identify the problem and the solution and the main cause and effect relationship in the information below.

Chemical Pesticides and Fertilizers

In the natural plant cycle, plants take nutrients from the soil and return them when leaves and other plant parts die and *decompose*. When people take plant matter (grains and hay) from the soil, they are also removing *nutrients*. Over time, if the nutrients aren't replaced, the soil can no longer provide enough nutrients for plants to grow. In early years, farmers replaced these nutrients by adding animal manure, growing a *legume* crop, resting fields or *rotating crops* from year to year so fields could restore some of their nutrients through natural processes.

In the 1920s, farmers began using tractors instead of horses and mules. They began using *inorganic* nitrogen fertilizers to replace the organic nitrogen the fields had been getting from animal manure. Nitrogen is one of the major nutrients plants need to grow. In the 1940s, farmers learned to use chemicals to kill insects and weeds. These chemicals now help one American farmer provide food and fiber for 50 non-farmers.

Chemicals have caused some problems, too. Chemical *pesticides* can kill other *organisms* besides the ones for which they are intended. Some of the organisms they kill are useful ones that help crops grow naturally. *Chemical fertilizers* also cause reactions in the soil that, over time, can make the soil less desirable for plant growth. Chemicals used in agriculture can also *contaminate* the water we drink. Sometimes they move through the soil and enter the *underground water supply*, and sometimes they are carried by rainwater into lakes, rivers and streams.

Farmers are concerned about these problems. They are trying new methods that will help them grow enough food for all the people to eat without damaging their land and water supplies. These methods help farmers use fewer chemicals on their fields. One method is *Integrated Pest Management*. Under this method, farmers first find out how many and what kinds of pests they have. They don't use chemical pesticides unless there are enough pests to cause economic crop damage. They often choose environmentally-friendly pesticides or beneficial insects to control the pests.

Another method makes use of a computer installed in the farmer's tractor. The farmer takes soil samples from his or her fields and has them chemically tested at a laboratory. The computer is connected to a satellite positioning system which uses the results of the soil tests to tell the fertilizer spreader where to place the fertilizer and how much to use.

Problem	
Solution	
Cause	
Effect(s)	

Does the solution create another problem? If so, what is it? _____

Name _____

The Farmer Cares For the Land (answers)

A. Wetlands

Problem	Loss of wetlands
Solution	Passing laws to protect wetlands
Cause	Draining or filling in wetlands
Effect(s)	Flooding, loss of habitat for wildlife, loss of natural water purification

New problem: People are unable to use their property as they wish.

B. Soil Erosion

Problem	Soil Erosion
Solution	Rotational grazing, no-till farming
Cause	Overgrazing, clearing vegetation from soil
Effect(s)	Soil washes or blows away

New Problem: Use of herbicides may cause water pollution.

C. Chemical Fertilizers and Pesticides

Problem	Overuse of chemicals
Solution	Integrated Pest Management, computers to monitor fertilizer use
Cause	Using chemical fertilizers and pesticides
Effect(s)	Increases production, pollutes water

New Problem: None identified in text.