

Why Ag in the Classroom?

In times past, people were very aware of the role agriculture played in their lives. It meant survival! Nearly everyone—men, women and children—worked the land.

Agriculture still means survival. That will never change. But as time goes on, fewer and fewer people have close contact with farming. They're not aware of their own—and the nation's—total dependence on agriculture. Think about it:

- Less than two out of 100 Americans work in production agriculture (farming). This small group meets the food and fiber needs of the nation as well as many people abroad.
- Agriculture, along with its related occupations, is the nation's largest industry. It generates billions of dollars each year; one out of every five jobs depends on it in some way. It has massive impact on the American economy, greatly influences the U.S. international balance of trade and directly affects the number of jobs here at home.

Our citizens must be agriculturally literate in order to make responsible decisions affecting this giant lifeline. Building that literacy in consumers and leaders is what Ag in the Classroom is all about.

Academic Standards Connection

The student Minnesota AgMag and other educational materials from Minnesota Agriculture in the Classroom can meet many of the new academic standards. These materials can serve as a wonderful "real life" connection and supporting piece as you incorporate the standards into your classroom activities. Here are a few examples of potential connections:

SOCIAL STUDIES (Economics Strand) Standard: The student will understand the concept of interdependence in relation to producers and consumers.

(Geography Strand) Standard: The student will identify how technology made some parts of Minnesota more valuable at particular times in history.

SCIENCE (History and Nature of Science Strand) Standard: The student will know that science and technology are human efforts that both influence and are influenced by society.

LANGUAGE ARTS (Reading and Literature Strand) Standard: The student will use a variety of strategies to expand reading, listening and speaking vocabularies. The student will read with accuracy and fluency.

MATHEMATICS (Data Analysis, Statistics and Probability Strand) Standard: The student will represent and interpret data in real-world and mathematics problems.

About Your AgMag

Your AgMag is distributed primarily to teachers in grades studying Minnesota (usually fourth or sixth). If the magazine fits better into the curriculum program at another grade level, we encourage you to pass the material on to the appropriate teachers.

Offered at no cost to you, the AgMag is a product of Minnesota Agriculture in the Classroom. You'll receive three issues this school year: October, December and March.

This second issue of your AgMag is designed to help you:

- introduce a basic agricultural production cycle: producing, processing, distributing, marketing, consuming
- highlight the plant and animal connection
- offer expanded information about pizza and how it is created through the agriculture cycle
- present information about world population and world hunger, and the challenges they present to agriculture
- offer insights about agriculture and foods in Minnesota from 1825 to 1970.

Hello Out There (Resources)

MINNESOTA AGRICULTURE IN THE CLASSROOM

Attn: Al Withers, Program Director
625 Robert Street North, St. Paul, Minnesota 55155
Telephone: 651-201-6688 • E-mail: alan.withers@state.mn.us
www.mda.state.mn.us/maic

Great resources available! Tell your primary level colleagues about our **new AgMag Jr.**, tell your middle school and junior high science colleagues about the "Fields of Energy" DVD and tell your media specialist about our **children's literature book bundle**.

New! **Now Available!** New full-color Minnesota Commodity Card Set (20 Cards)

\$\$\$\$ Grants Available \$\$\$\$

Don't forget to apply for a MN Ag in the Classroom Ag Literacy Grant! The next application deadline is February 1,

2010. You can request up to \$400 this year, and we are encouraging applications in the areas of youth gardening, ag-related field trip experiences and unique integration and innovation ideas. Give it a try!



If your students are studying the states, have them visit the National Ag in the Classroom web site (click on State Profiles, then State Websites on the home page) to learn about each state's unique agriculture. You'll also find a wealth of teacher resources available (mostly free) from other state programs: www.agclassroom.org



MINNESOTA HISTORICAL SOCIETY

For great Minnesota historical pictures go to the Society's Photo and Art Database at: www.mnhs.org/collections

Integration

Your AgMag materials are created by experienced classroom teachers. An Editorial Review Committee provides content ideas and reviews each issue.

Some teachers use the magazine as a separate lesson; others integrate magazine content into specific areas of the curriculum. The subject matter and skills listed will help you select appropriate agriculture activities to integrate into other curriculum areas.

Language Arts, Reading Literacy: Use the articles and activities to develop a variety of skills: webbing, outlining, non-fiction reading, reading for the main idea, vocabulary development (bold words throughout, pretest/post-test, activities throughout the AgMag, reproducible pages in Teacher Guide).

Social Studies, History: Social Studies appear everywhere in the AgMag. See *Agriculture in a Hungry World* and *More Mouths to Feed*, page 6 and the history information on page 7. In the Teacher Guide, see pages 3 and 5.

Creative Writing: Examples: Stories from the points of view of plants or animals that depend on humans; predictions for the future of agriculture; letters to children in other countries, with descriptions about life here and questions about life there.

Geography, Map Skills: See AgMag page 8 and Teacher Guide page 5.

Science: See *Plants and Animals*, page 3 and *Where Does Your Pizza Come From?*, pages 4 and 5.

Math: See graphs and activities pages 3, 4, 5, 6, 7 and 8, and Teacher Guide page 4.

In This Guide: Don't Miss...

- SHOW WHAT YOU KNOW pretest and post-test on page 6. Check your students' knowledge of key agricultural concepts before and after reading the AgMag!
- Discussion prompts, background information, extended activities and answers.
- Four reproducible activities: *Inventors and Inventions* (page 3); *Are You a Wheat Whiz?* (page 4); *Food: Everybody Pays* (page 5); *Show What You Know* (page 6).

Glossary

Some words in your AgMag may be unfamiliar to your students. These words often appear in bold type or in italics. Many are defined in the articles. Words you might wish to pre-teach are:

interdependent (cover); **raw materials, natural and renewable resources, agriculture cycle, livestock** (pages 2-3); **raw agricultural products** (pages 4-5); **malnutrition, developed country, less-developed country** (page 6).

Discussion Prompters

Cover (Social Studies)

1. What makes "Agriculture, the Land, and You" a good title for this page? (*Each of the products mentioned in the article, and shown in the photo and illustrations started out with a connection to the land, the soil. All end up being used by people.*)
2. What connections to agriculture do you see in this photo? (*Girl's clothes, pizza and paper box, sweater, newspaper, tree and soil, turkey and candle with wood holder.*)

Student Pages 2 and 3 (Social Studies, Science, Economics)

1. How many things in your classroom came from agriculture?
2. What have you eaten or worn today that came from an animal? A tree or plant? The soil? Which came from beef or dairy cattle? Corn or soybeans?

3. Why do we say agriculture depends on natural and renewable resources? (*The agricultural products that are produced, processed and distributed all are dependent on soil, sun, air and water in some way. Animals and plants are considered renewable resources.*)
4. What foods do NOT come from plants and animals? (*Mushrooms and yeast are fungi, not plants.*)

Student Pages 4 and 5 (Science, Social Studies)

As a nation, latest figures show we eat 100 acres of pizza every day. That's 350 slices every second! Pizza is unique in that it offers so much variety: there is a pizza for every taste, culture and nutritional interest. The first signs of pizza-making were found in Pompeii, Italy, which was destroyed by the eruption of Mount Vesuvius. Naples, Italy is known as the Pizza Capital of the World.

1. Lead students to understand that all pizza ingredients start with agriculture. Have them research the raw agricultural products that make up their own favorite pizzas.
2. Pizza Probability Activity: The idea of this activity is to have students determine the maximum number of combinations that can be made using three ingredients. There are seven.

Student Page 6 (Social Studies)

1. What does the population trend of the future (more people in cities and less-developed countries) mean for agriculture? (*Production must keep increasing in order to feed everyone. Transportation and distribution will be even more important than they are today. Growing urban populations will use resources in greater quantities than their fewer rural neighbors who produce the food. Conserving land, water and energy resources and using new technologies to increase production will grow in importance. Marketing new products will continue to be a growing business.*)

Student Page 7 (Social Studies, History)

1. In the period between 1825 and 1970, food production, choices and availability went through huge changes in Minnesota. Small settlement farms fed families at the beginning of the period. Large electricity-powered and mechanized farms fed masses of people by the end of the period. How did the day-to-day lives of farm families change during this period? Think about their work days, home furnishings, leisure time, food choices, travel options and more.)
2. Between 1875 and 1890 the booming wheat market led to huge farms in the Red River Valley of Minnesota and North Dakota. Why did the bonanza farms die out? (*Investors put in a lot of money and grew wheat on a grand scale. Their bonanza farms covered thousands of acres. Five hundred to a thousand migrant workers might work on a single bonanza farm. The bonanza farms were highly profitable through the use of machinery and the availability of low-paid workers. During times of drought or low wheat prices, however, their profits fell. Family farmers, with less machinery investments and fewer workers to pay, could better ride out the ups and downs of the market. By the 1890s, the bonanza farms were being broken into smaller family farms.*)
3. Between 1945 and 1960 the U.S. population increased by 40 million, a whopping 30 percent. How did this affect farming in Minnesota? (*Farmers in Minnesota and across the nation grew more and more food to feed the swelling masses.*)
4. Supermarkets emerged as the predominant food retailer in the 50s and 60s. How did these stores affect the eating choices and habits of families? (*Instead of going to individual meat markets, dairy stores, etc., they could do "one-stop shopping." Families had hundreds more food choices than in the preceding decades. They could compare prices and products in ways not before possible. In 1954, CA Swanson and Sons introduced the frozen TV dinner, the same year color TVs entered the market. Fast, easy, prepared meals and convenience foods brought in a new era of shopping and eating.*)

Inventors & Inventions

Word Bank:

Thomas Edison
Louis Pasteur
Charles Birdseye
John Deere
Cyrus McCormick
Samuel Morse
Charles Goodyear
Alexander Graham Bell
Rudolph Diesel

Circle which came first

pasteurized milk or tv dinners
gasoline engine or steam engine
telephones or tractors
canned foods or frozen foods
electric lights or telegrams
vacuum milkers or pasteurized milk

Many inventors and inventions have changed agriculture. Fill in the missing inventors. How is the name sometimes the clue? How can you find answers you do not know?

Invention	Inventor	Year
Canned Foods	Nicolas Appert	1787
Cotton Gin	Eli Whitney	1793
Steam Locomotive	Richard Trevithick	1804
Reaper	_____	1834
Refrigerator	Jacob Perkins	1834
Steel Plow	_____	1836
Vulcanized Rubber	_____	1839
Telegraph	_____	1840
Gas Engine	Jean Lenoir	1860
Pasteurization	_____	1864
Margarine	Hippolyte Mourles	1869
Barbed Wire	Joseph Glidden	1873
Telephone	_____	1876
Vacuum Milking Machine	Anna Baldwin	1878
Electric Light	_____	1879
Internal Combustion Engine	_____	1892
Tractor	Benjamin Holt	1904
Frozen Food Process	_____	1925

NOTE: Lay a piece of plain paper across the answers to block off the lower part of this sheet before photocopying. Invite students to use the resulting blank space to write about things they think are really cool inventions or things they wish could be invented.

ANSWERS: AgMag

Agriculture Cycle, p. 2

1. Producing 2. Processing 3. Distributing
4. Marketing 5. Consuming

- Photos top to bottom: 1, 5, 2
- Products with more steps use more energy, especially in processing. Example: Fresh potatoes are picked, cleaned, graded, packaged and ready for consumers. Potato chips add slicing, baking or frying, seasoning and inspection to the cycle.
- Sun, air, water and soil are the resources from which all agricultural products develop.

Raw Agricultural Products, pgs. 4 and 5

crust/wheat; sauce/tomato; cheese/milk;
pepperoni and sausage/pork; hamburger/beef

Cheese—Cheddar and mozzarella

Peppers—Yellow, red, orange and purple

Pepperoni and Sausage—Meat from hogs is called pork.

Onions—Tears are caused by juices and chemicals inside the onion. When a knife breaks the onion's cells, a sulfoxide compound becomes airborne as a fine mist. When the misty droplets land on a wet surface (like eyes) they dissolve into sulfuric acid, which is irritating.

Mushrooms—Many mushrooms are deadly poisonous. Only mushroom experts can tell which mushrooms are safe to eat.

Pizza Probability—7 different pizzas

Why Are They Hungry?, p. 6

Across: 5. transportation; 10. crop;
12. drought; 13. spoiling.

Down: 1. stealing; 2. wars; 3. government;
4. poverty; 6. storage; 7. trade;
8. processing; 9. floods; 11. pests.

Graph Study, p. 7

The number of farms in Minnesota is going down because smaller farms can be combined to make larger farms. Technology and better machinery make it possible for farmers to farm more land and increase their income.

Calling it Home, p. 8

Three Rivers: Mississippi, St. Croix,
Red River of the North

Eleven Ways to Say Bread, p. 8

1. Pita - Arabian
2. Tortilla - Mexican
3. Lefse - Norwegian
4. Soda Bread - Irish
5. Spaghetti - Italian
6. Brioche - French
7. Bagel - Jewish
8. Wonton - Chinese
9. Scone - Scottish
10. Stollen - German
11. Johnny Cake - American

ANSWERS: Teacher Guide

Inventors and Inventions

Missing inventors, in order: Cyrus McCormick, John Deere, Charles Goodyear, Samuel Morse, Louis Pasteur, Alexander Graham Bell, Thomas Edison, Rudolph Diesel, Charles Birdseye.

Which came first: pasteurized milk, steam engine, telephones, canned foods, telegrams, pasteurized milk.

Are You a Wheat Whiz?

1. wallpaper paste
2. malt powder
3. spaghetti
4. pretzel

Riddle: Spaghetti

Food, Everybody Pays

Think and Discuss: The connection between food costs and fuel costs is that all parts of the agriculture cycle (production, processing, distribution) use fuel. As fuel costs more, these increases are passed on to the customer. Increased costs of feed, seed, fertilizer, etc. on the farm are also passed on. As demand for anything goes up, prices go up. As supply goes down, prices go up.

Countries paying the most of their income are generally less-developed countries. Developed countries tend to pay less. People in the United States pay least of all.

Show What You Know, PreTest/Post-Test

1. producing, processing, distributing, marketing, consuming
2. b 3. c 4. b 5. c 6. a 7. c 8. b 9. b

Are You a Wheat Whiz?

You **ARE** if you can solve these math problems to discover four wheat products spelled by the right answers! (See the code below.)

1	$\begin{array}{r} 21 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 6 \overline{)36} \\ \hline \end{array}$	$\begin{array}{r} 4 \overline{)56} \\ \hline \end{array}$	$\begin{array}{r} 59 \\ -45 \\ \hline \end{array}$	$\begin{array}{r} 4 \overline{)84} \\ \hline \end{array}$	$\begin{array}{r} 7 \overline{)42} \\ \hline \end{array}$	$\begin{array}{r} 60 \\ -39 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ -49 \\ \hline \end{array}$	$\begin{array}{r} 6 \overline{)60} \\ \hline \end{array}$	$\begin{array}{r} 7 \overline{)147} \\ \hline \end{array}$	$\begin{array}{r} 19 \\ -13 \\ \hline \end{array}$	$\begin{array}{r} 4 \overline{)16} \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \overline{)78} \\ \hline \end{array}$
2	$\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ -12 \\ \hline \end{array}$	$\begin{array}{r} 2 \overline{)28} \\ \hline \end{array}$	$\begin{array}{r} 11 \\ +13 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 2 \overline{)38} \\ \hline \end{array}$	$\begin{array}{r} 59 \\ -43 \\ \hline \end{array}$	$\begin{array}{r} 12 \overline{)144} \\ \hline \end{array}$	$\begin{array}{r} 12 \\ +14 \\ \hline \end{array}$	$\begin{array}{r} 6 \overline{)60} \\ \hline \end{array}$				
3	$\begin{array}{r} 7 \overline{)28} \\ \hline \end{array}$	$\begin{array}{r} 13 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 8 \overline{)48} \\ \hline \end{array}$	$\begin{array}{r} 33 \\ -11 \\ \hline \end{array}$	$\begin{array}{r} 22 \overline{)44} \\ \hline \end{array}$	$\begin{array}{r} 4 \overline{)104} \\ \hline \end{array}$	$\begin{array}{r} 68 \\ -44 \\ \hline \end{array}$	$\begin{array}{r} 44 \\ -20 \\ \hline \end{array}$	$\begin{array}{r} 6 \overline{)42} \\ \hline \end{array}$					
4	$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \overline{)50} \\ \hline \end{array}$	$\begin{array}{r} 17 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ -12 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 39 \\ -13 \\ \hline \end{array}$	$\begin{array}{r} 2 \overline{)28} \\ \hline \end{array}$							

CODE (Example: 18 divided by 9 = 2, which means H)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Y	H	F	S	X	A	I	J	U	R	B	D	C	L	M	W	K	V	O	N	P	G	Q	T	Z	E

My farm is ten miles long and one-half inch wide. What do I raise on it?

Simple Pizza Dough Recipe

2 cups	all-purpose flour*
2 tsp.	active dry yeast
1 Tbls.	sugar
1 tsp.	salt
1 cup	warm water
1 tsp.	olive oil (for greasing bowl)

Mix all dry ingredients first, then add the water. It will appear to be too dry. Do not add water. Keep working the dough until it is smooth.

Let the dough rise once in a greased bowl (up to one hour). Punch it down and knead again.

At this point you may choose to freeze some of the dough to use later. If you do freeze it, be sure to wrap it well and freeze it quickly. With either fresh or thawed dough, let the dough rise a second time.

After it has risen, punch it down (takes air bubbles out) and use it for your pizza. The dough will rise a little while you put the rest of your pizza toppings on it. Bake as appropriate for pizza thickness and toppings.

*For more nutrition you may substitute whole **wheat** flour or a mix of half all-purpose and half whole wheat flour.



1/2 inch

You solved this riddle with one of your answers above. Which answer?

FOOD Everybody Pays

You've been reading how great Minnesota is for growing foods. At the same time you've been hearing people talk about food costing more. Why is the cost of food rising?

Think and Discuss

- The price of fuel has steadily gone up. What's the connection between fuel costs and food costs? Think about food production as well as food distribution (page 2).
- Costs of feed, seed and fertilizer on the farm have gone up. How does that affect the price of food?
- Think about where some of our foods come from. How might weather events, such as a hurricane on the Gulf Coast, floods in Illinois or drought in Australia affect the food supply? If supplies go down, what happens to food prices?
- More people in more countries are demanding and using more fuel and food. We all compete for limited supplies. If demand for fuel and food goes up, what happens to the prices?



Rising Food Costs

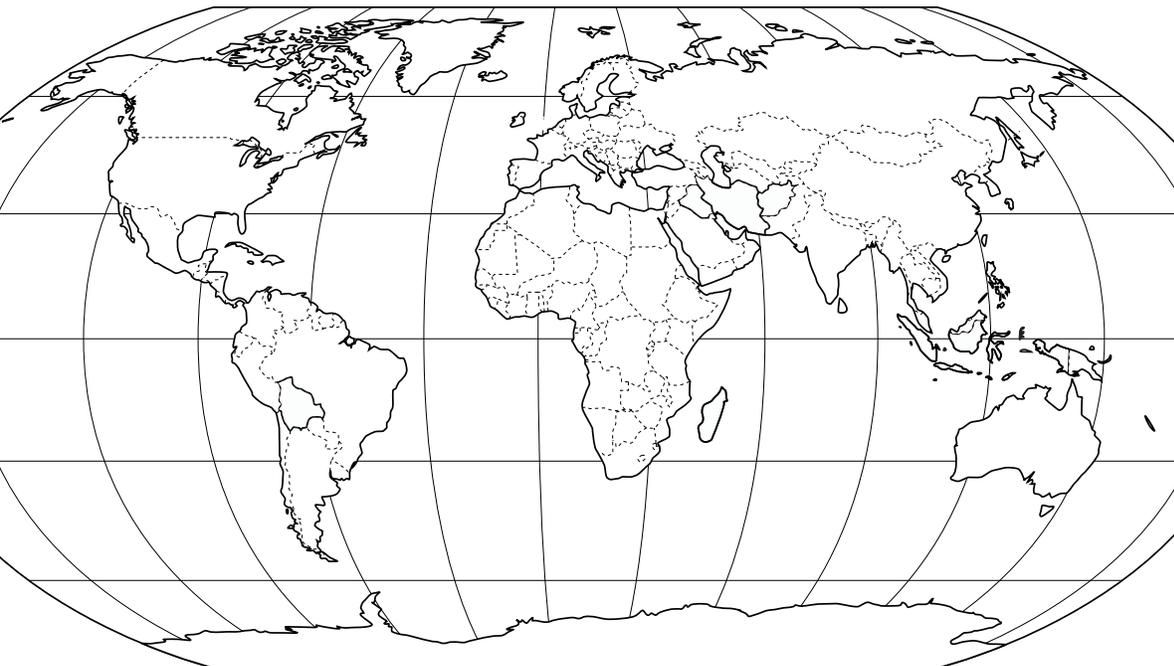
What Can Families Do?

- Take less and waste less. Wasted food equals wasted money and energy.
- Compare prices. Do name brands cost more than store brands?
- Buy foods that are in season. Know the local growing season for different types of food.
- Buy foods that are on sale. Read the ads and clip the coupons before you shop.

What does your family do to save money on food?

Percentage of income spent on food

Look below at some of the world's countries. What percentage of their income do people in each of these countries spend for food? Use the code to color the map. You may need a world map to find the countries.



Code

Red over 50%
 Orange 26 - 49%
 Yellow 11 - 25%
 Green 10% or less

Country	Percentage
Afghanistan	over 50%
Bolivia	over 50%
Iran	over 50%
Iraq	over 50%
Madagascar	over 50%
Brazil	26-49%
China	26-49%
India	26-49%
Philippines	26-49%
Russia	26-49%
Australia	11-25%
France	11-25%
Canada	11-25%
Italy	11-25%
Japan	11-25%
Mexico	11-25%
New Zealand	11-25%
Norway	11-25%
Spain	11-25%
South Africa	11-25%
Sweden	11-25%
United Kingdom	11-25%
United States	10% or less

- What do the countries that pay the **most** of their income have in common?
 What do the countries that pay the **least** of their income have in common?
 Which country pays the least for food?



Note to Teachers:

You are encouraged to send the Pretest and Post-test results to Ag in the Classroom to help document student learning. Use the attached postage-paid evaluation card.

Name _____

Check one Pretest Post-test

Show What You Know!

Take this short quiz before you read your AgMag, then again after reading the magazine. See the improvement!

1. Name five steps in an agriculture cycle.
a. _____ b. _____ c. _____ d. _____ e. _____
2. These are the source of food for every other living thing.
a. animals b. plants c. fungi
3. More than half the world's population depends on this plant for a daily meal.
a. wheat b. corn c. rice
4. How many people are living in the world today?
a. over three million b. over six billion c. over twenty million
5. Three rivers that help define Minnesota's borders are
a. Cannon, Minnesota, Rum.
b. Mississippi, St. Louis, St. Croix.
c. Red River of the North, Mississippi, St. Croix.
6. Minneapolis was once widely known for producing
a. flour. b. salt. c. wild rice.
7. Minnesota became a state in
a. 1825. b. 1902. c. 1858.
8. The world's less-developed countries include
a. Japan and Australia.
b. Bangladesh and Uganda.
c. United States and Canada.
9. Pizza came to the U.S. through immigrants from
a. France.
b. Italy.
c. England.

