

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 tomorrow's 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 (History Strand) Standard: The student will know and understand Minnesota's major industries, social, political and technological changes that accompanied industrialization.

(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.

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 Minnesota from 1908 to 1958
- expand agricultural career knowledge (Teacher Guide, page 5).

Hello Out There (Resources)

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If your students are studying the states, have them visit the National Ag in the Classroom web site (click on State Profiles 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 a great sesquicentennial historical timeline go to: <http://events.mnhs.org/timepieces/Timeline.cfm>
- For information on the Minnesota 150 Sesquicentennial exhibit and celebration go to: www.mnhs.org/exhibits/mn150
- For great historical pictures go to the Society's Photo and Art Database at: www.mnhs.org/collections

MINNESOTA DEPARTMENT OF AGRICULTURE

Visit your state agency at www.mda.state.mn.us and access the Directory of Minnesota Producer Associations and Agricultural Organizations at: www2.mda.state.mn.us/webapp/producers/default.jsp

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, 4 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 page 8.

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 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); *Name the Career* (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); **sesquicentennial**, (page 7); **infer** (page 8).

Discussion Prompters

Cover (Social Studies)

1. What makes "From the Land to You" a good title for this page? (Each of the products mentioned in the article and many in the photos started out with a connection to the land, the soil.)
2. How does each of these photos show a connection to agriculture? (Sports photo: uniforms, clothing, turf, trees. Pizza photo: pizza ingredients, pizza box, clothing, leather couch and building materials).

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 7.

Student Page 6 (Social Studies)

1. What does the population trend of the future (more people in cities and underdeveloped 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. How has the Betty Crocker symbol changed since it was first developed in 1921? Why do you think these changes were necessary? (The symbol has changed to reflect styles and changes in women's lives. The goal is to seem more current for the women of the day.)
2. What problems did farmers face in the 20s and 30s? (The 20s were better years for city folks than for people in small towns and on farms. Farmers had boosted food production to keep up with the rising worldwide demand during World War I. They kept production up even though demand for farm products went down after the war. As demand went down, prices went down for farm products. Farmers had trouble paying their debts and many went broke. Businesses that depended on farmers also felt the sting of the 20s farm crisis. By the 1920s, 60 years of wheat growing had taken its toll on most of Minnesota's farmland. Soil nutrients had been used up and worn out. Farmers faced a choice between two things: moving to farmland not yet worn out, or stay on the land and grow different crops. But starting new operations was expensive. The Great Depression, beginning with the stock market crash of 1929, meant both farmers and their customers had limited money to spend on anything. Then came the severe droughts of the 1930s. Huge dust storms stripped millions of tons of soil from the worn out fields. The damage made everyone see the need for farming techniques to protect the soil against wind damage.)
3. Research examples of the impact of the Great Depression on urban workers, farmers and families everywhere. Does your family have any stories about the Great Depression?
4. Just as it is today, the Minnesota State Fair was a big event throughout Minnesota history. Since Minnesota's first State Fair in 1859, five have been canceled. The reasons: the Civil War, the Dakota Conflict (also known as the Sioux Uprising) in Minnesota, the world's Columbian Exposition in Chicago, World War II fuel rationing and the polio epidemic (1946).

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. Tell kids to use the space to write about things they think are really cool inventions or things they wish could be invented.

ANSWERS: AgMag

Agriculture Cycle, p. 2

- Producing
- Processing
- Distributing
- Marketing
- Consuming

Think and Discuss, p. 2

Sun, air, water and soil are the resources from which all agricultural products develop.

Photos top to bottom: 1, 4, 2, 5, 3

Raw Agricultural Products, pgs. 4 and 5

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

Simply Saucy—Tomatoes are fruits. The fleshy part of a tomato is actually a berry.

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.

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.

Who's This?, p. 8

James J. Hill

The Jolly Green Giant is a well-known logo for processed vegetables.

We're Top Turkey, p. 8

Turkeys are grown in areas where the food they need (corn, soybeans, other grains) can be grown nearby.

Eleven Ways to Sate Bread; p 8

- Pita - Arab
- Tortilla - Mexican
- Lefse - Norwegian
- Soda Bread - Irish
- Spaghetti - Italian
- Brioche - French
- Bagel - Jewish
- Wonton - Chinese
- Scone - Scottish
- Stollen - German
- Johnny Cake - American

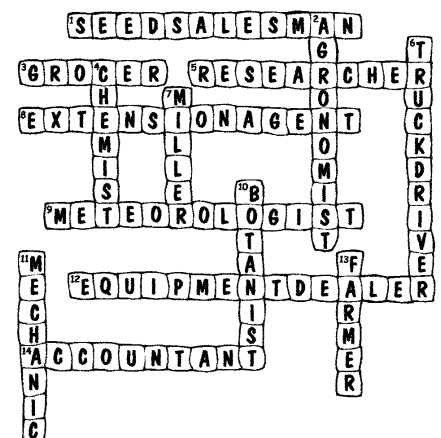
ANSWERS: Teacher Guide

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.

Name the Career



Are You a Wheat Whiz?

- wall paper paste
- malt powder
- spaghetti
- pretzel

Riddle: Spaghetti

Show What You Know, PreTest/Post-Test

- producing, processing, distributing, marketing, consuming
- 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)

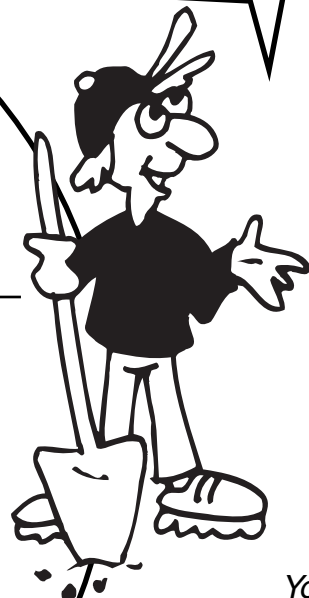
Mix all dry ingredients first, then add the water. It will appear to be too dry. Do not add water. Keep working the dough until it is smooth.

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.

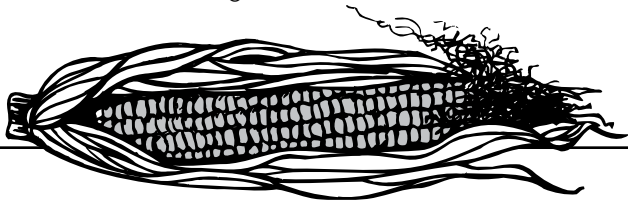


1/2 inch

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

NAME THE CAREER

Did you know that more than 20 million Americans work in some phase of agriculture? But only two million people live and work on farms or ranches. Many of the remaining 18 million people are involved in the processing phase of agriculture. They change crops and livestock into products we can use. Corn doesn't grow in a can and corn oil doesn't suddenly appear in a bottle!



Identify the following agricultural careers by fitting them into the crossword puzzle.

accountant
agronomist
botanist
chemist

equipment dealer
extension agent
farmer

grocer
mechanic
meteorologist
miller

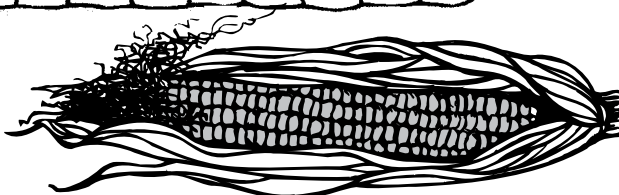
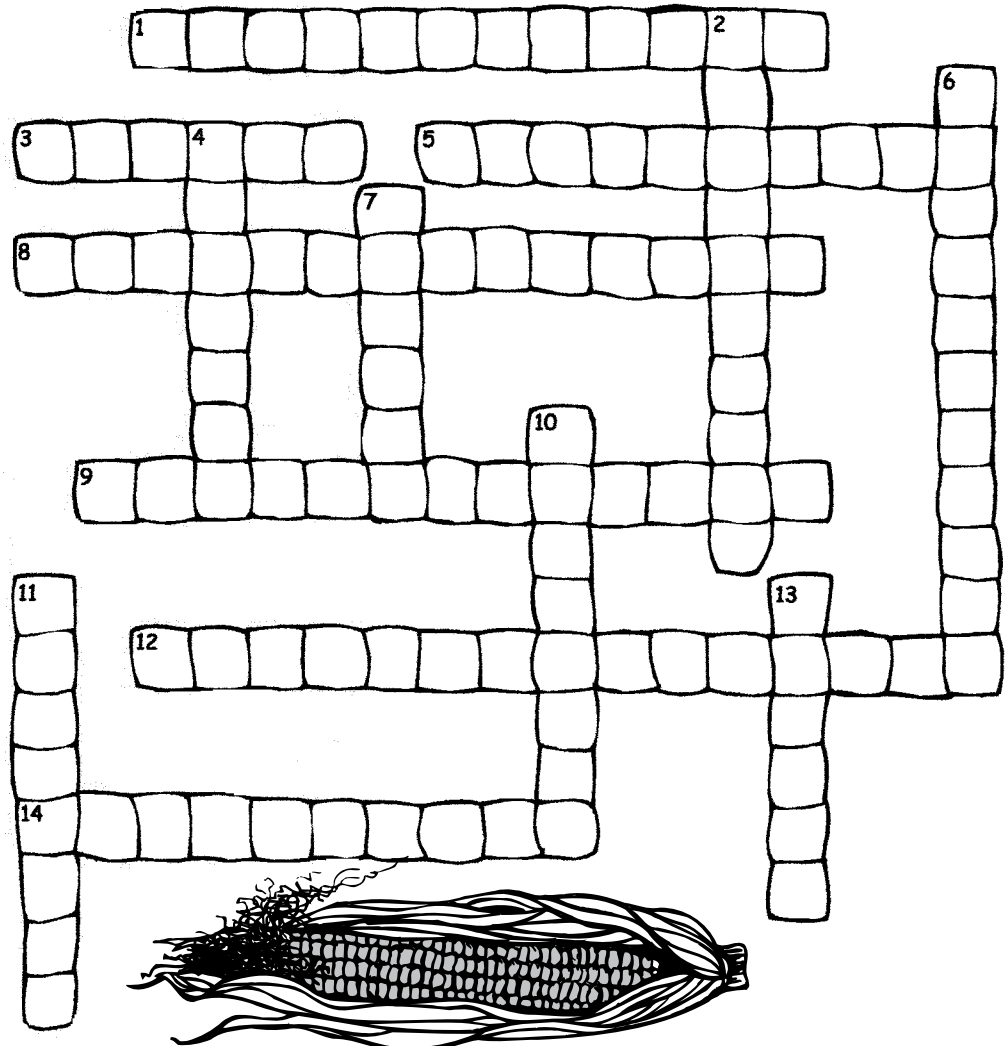
researcher
seed salesman
truck driver

Across

1. Supplies hybrid seed to the farmer
3. A person who sells food products
5. Scientist who investigates future uses of grains
8. Provides current information from university research to the farmer
9. Forecasts the weather
12. Sells the tractors, planters, tillage equipment and combines
14. Keeps the financial records

Down

2. Scientist who deals with crop production and soil management
4. Scientist who develops new and effective herbicides and pesticides
6. Hauls the crop from the farm to the processing plant or elevator
7. Grinds the grains into meal
10. Scientist who studies plants
11. Repairs and maintains the farmer's machinery
13. Responsible for planting, cultivating and harvesting the crop



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. What state leads the nation in producing turkeys?
a. Texas b. California c. Minnesota
6. Nicknamed the Empire Builder, this Minnesota businessman created the Great Northern Railway.
a. James J. Hill b. John Pillsbury c. William McKnight
7. In the 1930's American farmland was devastated by
a. wild fires. b. floods. c. dust storms.
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.



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