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AgMag

The Magazine of Minnesota Agriculture in the Classroom

Agriculture, the Land, and You!

What would people living in towns and cities do if there were no farmers? Where would they get food? Wool? Building supplies? Flowers, trees and shrubs? What would growers do if there were no town folks to buy their food or wool or wood or shrubs? What would it be like if each of us had to grow everything we need all by ourselves?

City people and growers need each other. We are **interdependent**. We buy and sell among ourselves so everyone can get the food, shelter and clothing they need. It all starts with agriculture. Agriculture grows what we need and changes it to forms we can use. Getting those things into our hands is part of agriculture, too.

When you put on a soccer jersey or play on a sod field, do you think about an agriculture connection? When you write a note, do you think about the tree fiber that went into the paper? As you eat your cereal, do you think about the soil, the water and the workers between the grain field and your cereal bowl?

Agriculture starts with soil, seeds, water and energy from the sun. It continues as millions of workers and billions of dollars change and move agricultural products from the land to you. Agricultural products come to you through supermarkets, lumberyards, drugstores, clothing shops, Christmas tree lots, garden centers, restaurants and dozens of other places.

Ag makes the world go round!
Could you have an ag-less day?
There's just no way!

Steps along the Way

Where do the supplies come from that are made (processed) into the things we eat, wear and use every day? The **raw materials** come from the land, through the work of farmers and growers. Those raw materials are possible only because of the **natural** and **renewable resources** of Planet Earth. Your wool sweater, your strawberry jam sandwich, your hockey stick—they're all thanks to renewable resources.

What happens to the raw materials between the land and you? It depends on the product. Which goes through more steps: grain between the field and your cereal box or carrots between the field and your salad bowl? What about your quarter-pound burger? It started out as a thousand-pound steer eating corn, soybean meal and grass. Your bread began as "amber waves of grain" and your wooden hockey stick as a tree.

Raw materials go through a cycle of processes before they get to us in forms we can use. After all, a handful of wheat kernels or a hunk of wool freshly sheared from a sheep wouldn't do us much good in these forms. The food, clothes and other things we use from agriculture all go through a cycle that:

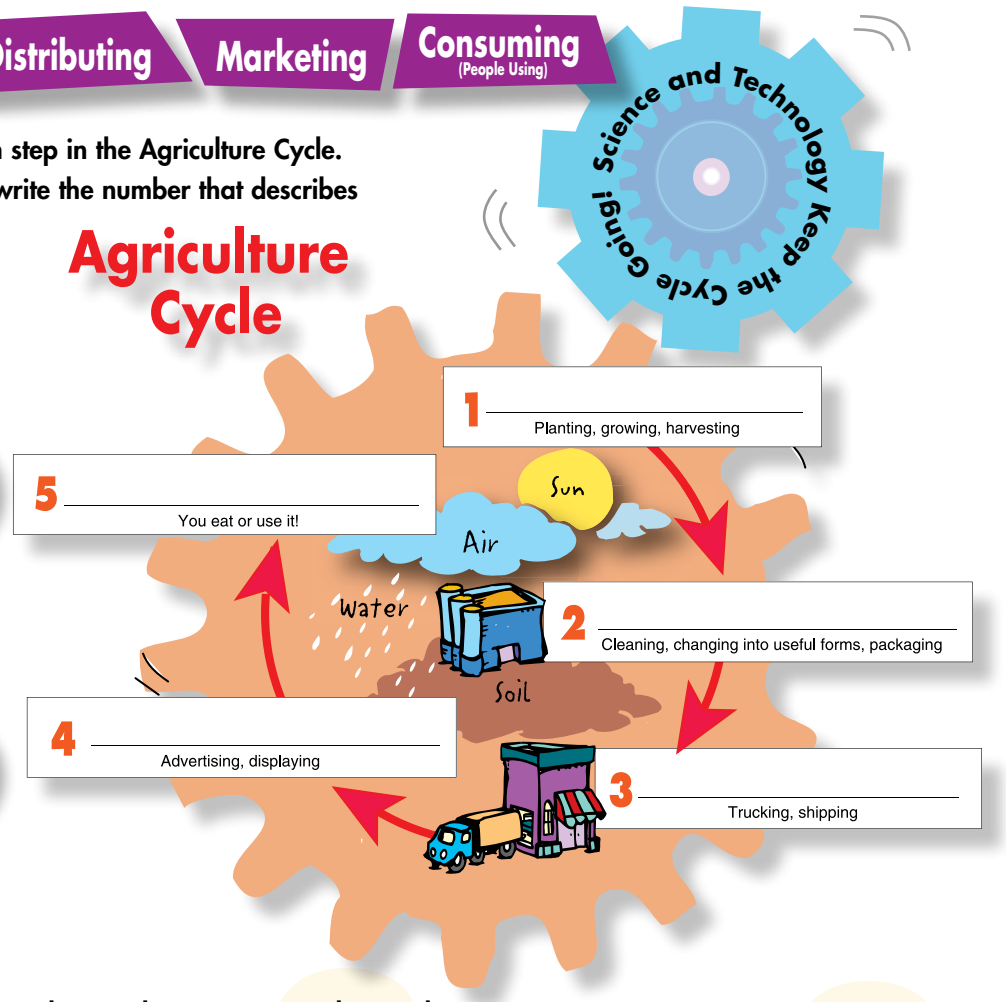
- starts with sunshine, water, soil and plants
- uses energy and equipment
- changes raw materials into many different things
- gets agriculture products to us in forms we can use!

The steps in the boxes below are part of most agriculture cycles.

Producing | **Processing** | **Distributing** | **Marketing** | **Consuming** (People Using)

- **Using the words above, label each step in the Agriculture Cycle.**
- **In the circle on each photograph, write the number that describes its place on the agriculture cycle.**

Agriculture Cycle



Products with more steps in their cycles have more impact on Earth's resources. Why?

_____

_____

_____

Why are sun, air, water and soil part of the agriculture cycle?

_____

_____

_____

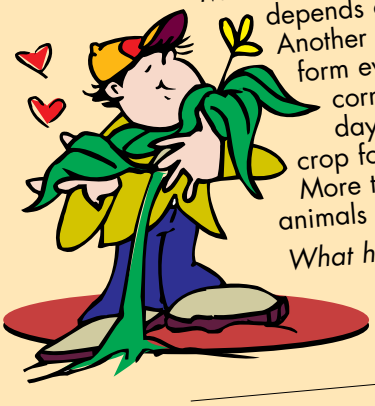
Photos Courtesy University of Minnesota Agricultural Experiment Station

Plants AND Animals

They're the only living things that make their own food. They are also the source of food for every other living thing. Plants become our medicines, fibers, paper products, cosmetics, spices and building materials. We burn plants for fuels. That includes wood as well as the fossil fuels that came from plants eons ago. We eat plants — roots, leaves, stems and fruits. Everything else we eat also eats plants! Finally, we depend on plants for the oxygen we breathe. Without plants, we would not survive.

Only about one-fifth of the land in the United States is suitable for growing crops. The rest has poor soil, too little rainfall, or rocky, rough surfaces that machinery can't handle. Forests cover millions of acres. Even though we can't grow food crops on these lands, **livestock** can often graze there. As livestock eat grass, they turn it into food and fiber people can use. Animals provide the eggs, milk, fish, burgers, steaks, chops and roasts that give us protein. They produce the wool and leather people use for clothes, shoes and baseball gloves. Animal fats are important in soaps, cleaners, cosmetics, paints, plastics and much more. Thanks to animals we have better lives.

Think & Discuss



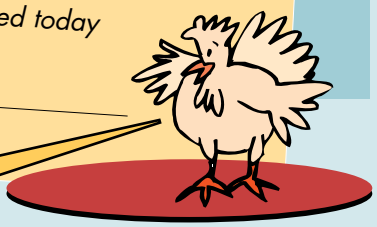
More than half the world's population depends on rice for a daily meal. Another one-third eats wheat in some form every day. One-fourth uses corn and corn products every day. Soybeans are another major crop for both people and animals. More than three-fourths of U.S. farm animals are fed corn and soybeans.

What have you eaten or used today that came from rice, wheat, corn or soybeans?

Think & Discuss

Millions of people around the globe depend on animals for food, clothing and shelter.

What have you eaten or used today that came from animals?



Did you say pizza? Read on!

Plants and Animals on Your Plate!

Next time you bite down on a pizza, take a closer look at what you are eating. Pause for a moment and think about all the things from both animals and plants that went into the making of your pizza.

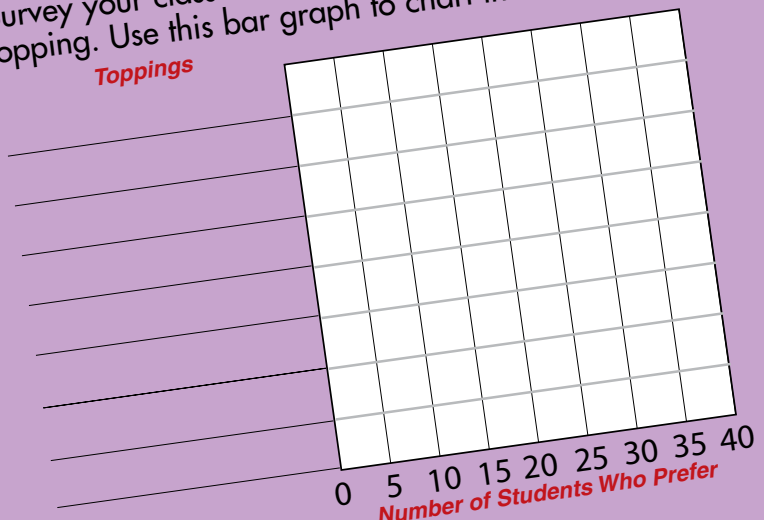
Do you know pizza can be a good nutritional choice? Make a list of the ingredients in your favorite pizza, and compare them to a food guide pyramid. A balance of vegetables (and sometimes even fruits), meat, dairy products and crust can give you foods from all the different food groups.

ON THE WEB **Food Guide Pyramid**
Check it out! **www.mypyramid.gov/**

ON THE WEB Do you like pizza and other fast foods? Dig into "The Real Truth About Fast Foods and Nutrition."
library.thinkquest.org/4485/frames.htm

My Favorite Pizza Ingredients

Survey your class to find out their favorite pizza topping. Use this bar graph to chart the results.



What's America's favorite pizza topping?

Pepperoni!

People of all ages love pizza. Surveys say kids from 3 to 11 choose pizza over other kinds of food. Read on and discover more about pizza and its ingredients.

Where Does Your Pizza Come From?

Do you know where the things you eat, wear and build with start out? Farms, fields and forests produce our agricultural products. Most of these products must be processed in some way before we can use them. Processing changes raw agricultural products into thousands of things we use every day.

Think about a pizza, for example. The parts of a pizza come from many different raw agricultural products. From the words in the word bank, choose the name of the agricultural product that is the source of each part of the pizza. Write it in the column on the left. In the column on the right, list another food that is made from that same raw product.

Pizza Part	Raw Agricultural Product	Another Food (From the same raw product)
crust	_____	_____
sauce	_____	_____
cheese	_____	_____
pepperoni	_____	_____
sausage	_____	_____
hamburger	_____	_____

Raw Product Word Bank beef milk pork tomato wheat

Crust Starts on the Farm

Fabulous Fractions

1. Use a ruler to divide this pizza into two halves.
2. Next, divide the pizza into four fourths.
3. Finally, divide the pizza into eight eighths so each slice is one-eighth of the whole pizza.

- How many pizzas would you need to give everyone in your class one slice of pizza? _____
- How many pizzas would you need to give everyone in your class two slices of pizza? _____

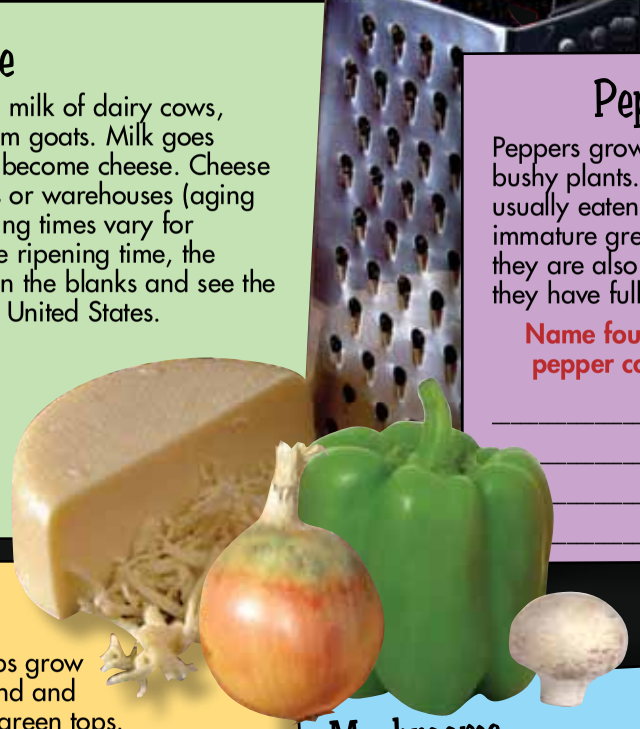
Pizza crust is made from wheat. Farmers plant tiny wheat kernels in the ground. Wheat looks like fresh new grass when it comes out of the soil. It grows to about 24 inches high, with kernels (seeds) forming at the top of the plants. The farmer harvests these wheat kernels and hauls them in trucks or wagons to the country grain elevator. From there it is exported or sold to various industries that make animal feed or human food. Wheat passes through a milling process to become flour for pizza dough. At the mill, it is cleaned to remove weeds, stems and other plant material. Rollers press the kernels to break them into pieces. Finally the small wheat pieces are shaken onto screens to sift out the parts not used in wheat flour. The wheat flour is mixed with yeast, oil, sugar, salt and water to make pizza dough.

Cheese

Cheese is made mainly from the milk of dairy cows, however some cheeses come from goats. Milk goes through a series of processes to become cheese. Cheese is aged in cooled storage rooms or warehouses (aging helps give cheese its flavor). Aging times vary for different cheeses. The longer the ripening time, the sharper the cheese's flavor. Fill in the blanks and see the two most popular cheeses in the United States.

_ _ e _ d a _

_ o _ z _ _ e _ l _



Peppers

Peppers grow on small bushy plants. They are usually eaten in their immature green stage, but they are also delicious after they have fully ripened.

Name four ripe pepper colors.

_____

_____

_____

_____

Simply Saucy

Pizza sauce comes from tomatoes. Tomatoes require 75 to 85 days to develop into mature plants with ripe fruits. When tomatoes are ripe, they are carefully packed into boxes and sent to grocery stores. Some tomatoes are sent to canneries where they are processed for sauces or ketchup. Special herbs such as oregano, dill and garlic are added to give pizza sauce its special taste.

Are tomatoes fruits or vegetables?

_____

Pepperoni & Sausage

Pepperoni and sausage both come from hogs. The animals are fed a special blend of ground corn, soybeans, vitamins, feed supplements and minerals. The hogs go to market in five to six months when they weigh 240-250 pounds. The meat from hogs is ground up and special seasonings are added to make sausage, salami, hot dogs, bacon and pepperoni. Pepperoni is America's favorite pizza topping.

The meat from hogs is called _____.

Onions

Onion bulbs grow underground and have long green tops. They may be picked by hand or machine and are cleaned before shipping. Onions are either sold at grocery stores and farmers' markets or sent to processing plants. At processing plants they are diced or processed to become ingredients for foods such as spaghetti, barbecue sauce and pizza. On average, each person in the U.S. eats 18.7 pounds of onions each year.

Why do many people have tears when chopping onions?

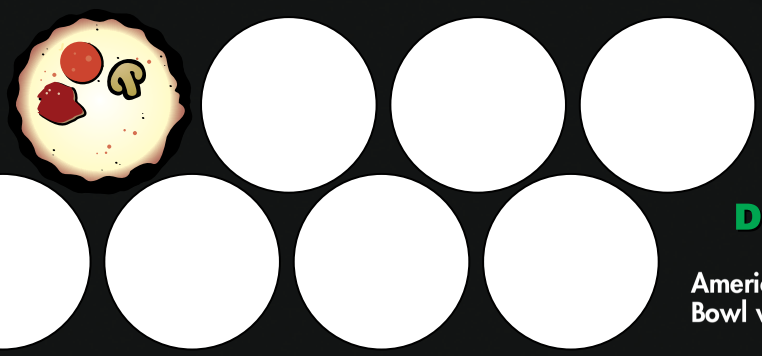
Mushrooms

There are close to 2500 types of mushrooms throughout the world, but the U.S. only has about 275 commercial mushroom growers. Mushrooms grow well in caves because they thrive in cool, dark places. They lack chlorophyll, the green substance used by plants to make food so they survive by soaking up nutrients from organic matter.

Why is it important to never eat wild mushrooms without an expert saying they're safe?

Pizza Probability

Pretend you are making pizzas and you have pepperoni, sausage and mushrooms for toppings. How many different pizzas can you make with these toppings? (None of the pizzas can have the same toppings as any of the others.) Fill in the circles until you run out of pizza topping combinations. The first one is done for you.



Did you know?

Americans eat more pizza during Super Bowl week than any other week of the year.

Pizza feature content adapted, with permission, from Illinois Agriculture in the Classroom

Agriculture in a Hungry World

In your first two AgMags this year, you learned a lot about agriculture in Minnesota and the United States. Our good climate, soil, water, weather, science and technology make American farmers the best food producers the world has ever known. Our farmers feed our whole nation. They also grow enough extra food to export millions of tons to the rest of the world. Many other countries produce a lot of food, too. Still, we hear about **malnutrition** and world hunger.

Why Are They Hungry?

There is enough food to feed everyone in the world. So why are some people starving? They simply can't get the food they need. Solve the crossword puzzle and you'll see some of the reasons food does not reach people who need it in many parts of the world.

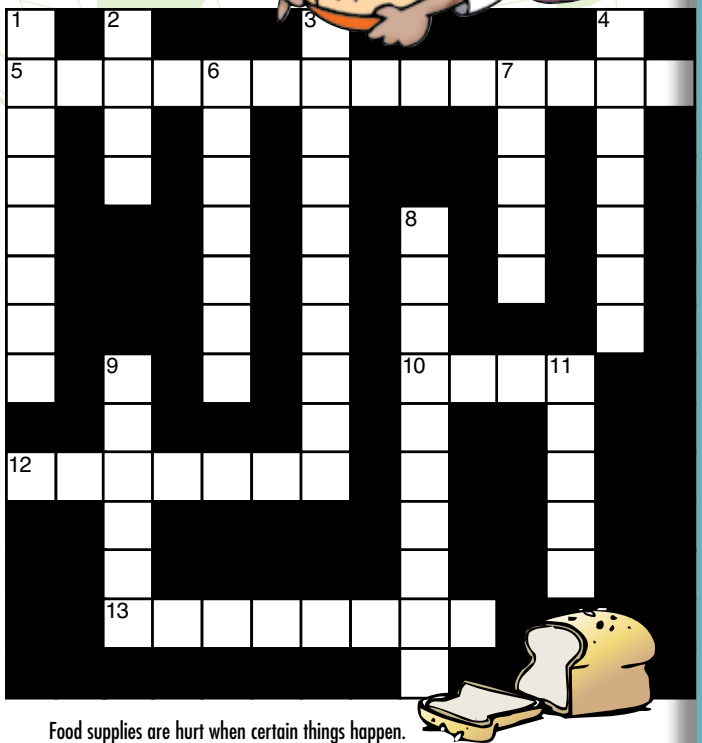
List some places you've been hearing about in the news where people suffer from hunger. What might be some reasons their needs are not met?

ACROSS

5 Reliable ways of moving things from place to place
10 Poor growing season; ____ failure
12 Too little rain to grow crops
13 Rotting and molding

DOWN

1 Robbing
2 Fighting in or among nations
3 Leaders of a country
4 Too little money
6 Clean, dry places to keep food
7 Buying and selling between countries
8 Changing raw products into forms we can use
9 Overflowing of rivers and streams
11 Insects and rodents



Food supplies are hurt when certain things happen. Sometimes land and water quality goes down. Pollution, natural disasters like floods, droughts, insects and over-planting one kind of crop can cause this damage. Sometimes people don't have the technology to produce and protect crops.

It takes all the world working together to solve hunger problems.

ON THE WEB

What's Your Ecological Footprint?
How many Planet Earths would be needed if everyone lived like YOU do?
Take the online quiz at Earth Day Network www.myfootprint.org

Photo Courtesy Dave Hansen

More Mouths to Feed

On November 17, 2009, the world population was over 6,797,000,000 and rapidly growing. If the current growth rate continues, the number of humans on the planet could double to 12 billion by 2050. All will need food, clothing, water and shelter, roads and schools. Demand will grow for sewers, power plants, homes, factories, malls and airports. Much land will be taken out of farming to meet those needs.

Add population dots for the year 2009 and year 2050 on the graph below. Connect all the dots to see the change in population growth. Most of the people will live in countries that are **less-developed** and where people have low incomes. They will live in cities and be consumers, rather than producers, of food.

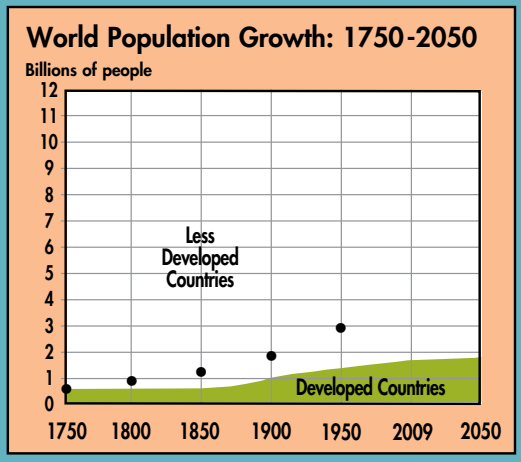


Figure and Compare!

Each day we add about 211,000 people to our world. How many people are added in an hour? Each minute? Each second?*

Two and one-half acres per person are needed to provide for every person's needs each year. Where will the food come from for all these people? That's the job of agriculture. Scientists and farmers are working hard to produce more food per acre.

ON THE WEB

The clock is ticking on this website to show you what's up in world population.
www.census.gov/main/www/popclock.html

*See answers on page 8.

See Issue 1 for History before1825

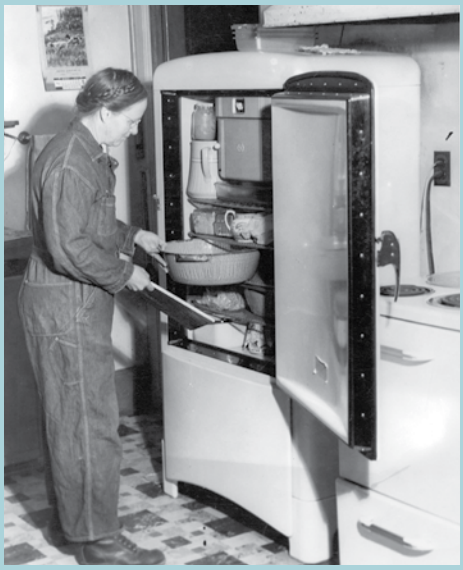
Our Bountiful Land: The Story of Food

1825-1970

More settlers from Europe and Canada came after Fort Snelling was built in 1819. Without grocery stores or feed stores, early pioneers had to get food for their families and livestock from their own farms. They cleared land with hand tools and simple plows pulled by horses or oxen. They hunted wild game and ate wild fruits. They planted gardens and grew potatoes, corn, squash, turnips and other vegetables. Their few farm animals could give them meat, milk and eggs, but those animals needed food, too. Poor crop years and long winters were scary for pioneer families. Where would they get enough food? How would they store the foods grown in summer so they would last through the winter? They learned to salt, pickle, smoke, dry and preserve foods in cellar dugouts so they would not spoil.

Settlers kept coming, and Minnesota became the 32nd state in 1858. Many of the new Minnesotans lived in towns and cities. They were consumers, not producers, of food. Some of their foods and supplies were shipped to them by rail or river from cities farther east. But mostly, they turned to the local farmers to feed them. Oats, corn, hay, wheat and eventually soybeans became huge food crops feeding our families and livestock. Fruits and vegetables grew in gardens and orchards all over the state. Beef cattle, milk cows, hogs, sheep, goats and poultry provided food. Modern railways, highways, air routes and two main waterways—the Mississippi River and the Great Lakes—carried tons of our agriculture products to people around the world and brought new foods here.

Huge farms called bonanza farms sprung up in the 1870s, mainly in the Red River Valley of Minnesota and North Dakota. They grew thousands of acres of wheat. Huge crews and the latest machinery harvested the wheat, which was ground into flour at mills in Minneapolis. The huge bonanza farms only lasted about 15 years.



In 1935 the Rural Electrification Administration (REA) brought electricity to farming communities. This greatly changed lives! It was much easier for farm families to store food year around through refrigeration. The cook's job got easier when electric stoves replaced wood burners.

Photos Courtesy Minnesota Historical Society

Help from Machines

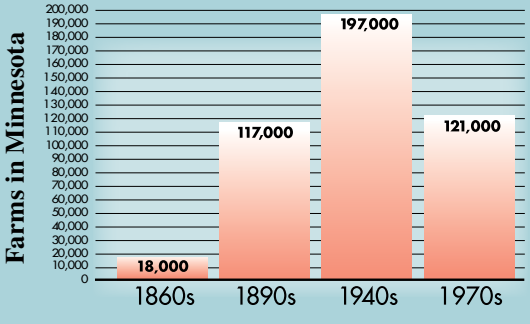
The land provides the bounty—but help from machines boosts the amount and variety of foods in our lives. New machines changed how many a farmer could feed:

- In **1830**, the family and a few farm animals.
- In **1900**, the family, the farm livestock and **five** other people.
- In **1950**, the family, many more farm livestock and **20** other people.

How was this possible? John Deere's steel plow and Cyrus McCormick's reaper, invented in the 1830s, saved labor. New and better plows broke up the tough, gummy prairie soils and large fields were planted and harvested. Tractors, invented in 1904, gradually replaced horsepower. It was only the beginning. By 1938, Machinery Hill at the State Fair showed over 75 pieces of machinery. Improved plows, tractors, combines and other machines kept coming. More food could be grown with less work. Farmers could farm much more land. They bought more land and farms became larger. By 1970, Minnesota agriculture was helping to feed the world.

Think and Discuss:

1. Imagine living without electricity. What would your life be like?
2. How did the lives of people change when they could go out and buy their food instead of growing it?



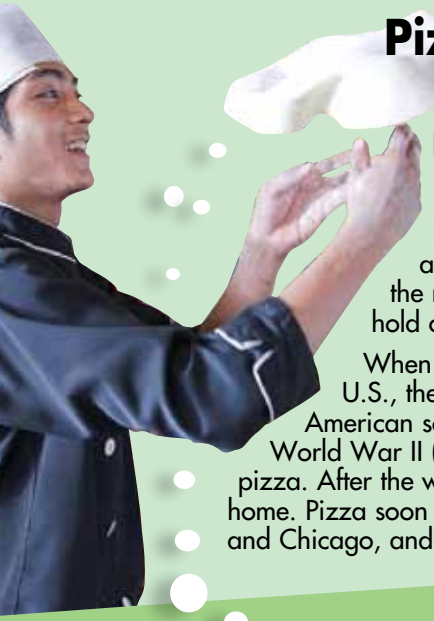
Study the chart to answer:

- What trends do you see?
- How would you explain these farm numbers?

AgMag Grab Bag

Answers: Page 6, Figure and Compare (Rounded figures)
Hours 8,800; Minutes 147; Seconds: 2.4

Pizza History



It is believed that the first pizza was made in Italy between 730 and 130 B.C. The pizza was flat, round bread baked with oils, garlic, herbs, olives and vegetables and covered with cheese. Why the rim? They needed something to hold onto!

When Italians immigrated to the U.S., they brought pizza with them. American soldiers stationed in Italy during World War II (1941-1945) fell in love with pizza. After the war, they wanted pizza here at home. Pizza soon became popular in New York and Chicago, and eventually all over the country.

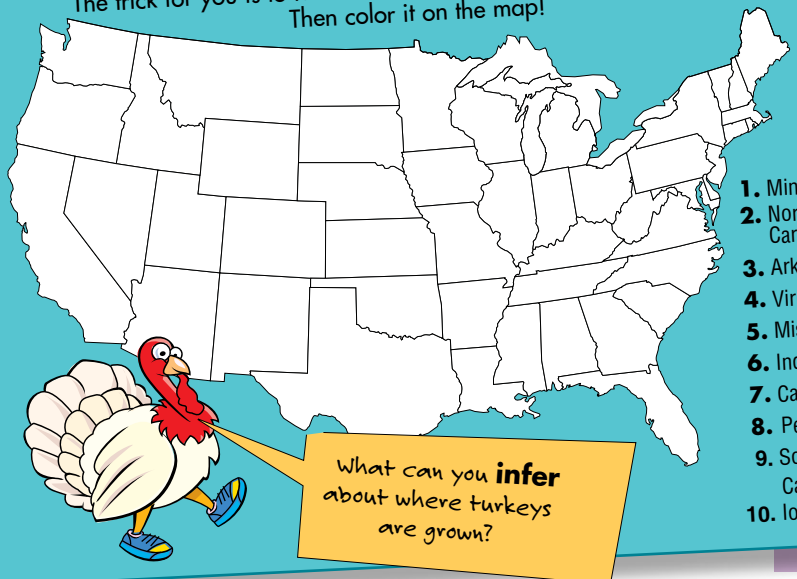
Flour Power! The Mill City Museum tells the story of Minneapolis's flour-milling past. Visit and get a whiff of the best-smelling museum ever created, or check it out on the Web:

ON THE WEB www.millcitymuseum.org/

Turkey manure is great organic fertilizer, too. Farmers and gardeners use it to enrich their soils.

We're TOP Turkey!

In 2008, Minnesota led the nation in turkey production. The top ten turkey-producing states are listed below. The trick for you is to label each state using the postal abbreviation. Then color it on the map!



1. Minnesota
2. North Carolina
3. Arkansas
4. Virginia
5. Missouri
6. Indiana
7. California
8. Pennsylvania
9. South Carolina
10. Iowa

What can you **infer** about where turkeys are grown?

Eleven Ways to Say Bread

Can you match the bread to the culture? It's bread (or pasta) any way you say it

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

Calling It Home

When people settled, they named their new communities. Sometimes they chose names from the old country. Some names described the land or place. Other communities were named after people and many places had Indian names.

Find examples of each type of name on a Minnesota map. The Minnesota Historical Society makes it easy to find out more about the meaning of the names of Minnesota people, towns and villages, lakes and streams.

ON THE WEB Go to: mnplaces.mnhs.org/upham/

Minnesota Territory: 1849-1858

Think & Discuss

- How and when did settlers first arrive where you live?
- How was your community named?
- Trace three rivers that help define Minnesota's borders. Mark Fort Snelling with an X.

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