AgMag
Exploring Minnesota Agriculture with Today's Youth
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Agriculture is Everywhere!

When you woke up in your bed this morning, you already had your first meet-up with agriculture. Somewhere in your bedding and pajamas were probably fibers from cotton plants.

- Did you wash or shower with soap? That bar of soap is made from fat from cattle and oil from plants such as palm, corn and soybeans.
- Did you have cereal, eggs, milk, bacon, pancakes, buttered toast or juice for breakfast? Thank agriculture again!
- Did you pack a lunch in a paper bag, or finish today's math by writing on paper? That paper comes from another agricultural crop—trees. Corn and soybean by-products may go into the ink in your books.
- Did you ride to school today? The tires on your bus, car or bike are made from the rubber plant, cords from cotton ar tallow from cattle. Did you pass a city park, a golf course, a orchard or nursery? Did you see a windbreak or a sod farm? All of these are agriculture, too.

Can you live a day without agriculture?

How does each of these photos show a connection to agriculture?

There's just no way!

What is Agriculture?

Name the only industry we need in order to survive.

If you said agriculture, you're right. And if you eat, wear clothes or have a home, you can see how you depend on agriculture yourself!

Maybe you said agriculture is farming. You thought of planting and harvesting crops and trees, or raising livestock and poultry. Maybe you said it was milking cows or selling fruits and vegetables. It's all this and more.

Agriculture is the industry that grows, harvests and brings us food, fiber, trees, turf and landscaping materials.

- **Food** comes from plants and animals.
- **Fiber** is the raw material from plants and animals that we use to make cloth and clothing, rope and more. Cotton, linen, silk, wool, sisal and hemp are fibers.
- **Trees** give us fiber that becomes lumber, furniture and firewood; pulp for paper; and materials for hundreds of other things. Turpentine and medicines are examples.
- **Turf and landscaping materials** include flowers, ornamental plants and turf (sod) for beauty, pleasure and recreation.

Agriculture brings us almost everything we eat, wear or use each day.

Agriculture is more than farming!

Agriculture is our nation's largest industry. More than 20 million Americans work in agriculture. They have jobs in:

Production: growing and harvesting plants; raising animals.

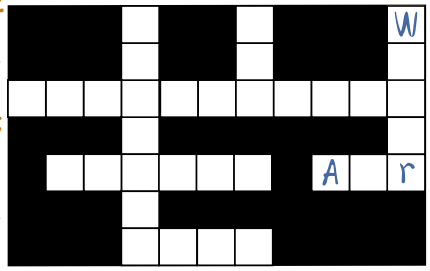
Processing: changing raw materials into many different things.

Distribution: getting the products to us.

More than 80% of all jobs in Minnesota agriculture are OFF the farm. How can this be?

Which part of agriculture does each group of workers below fit into? Label the three groups: production, processing, distribution. Circle a career that interests you. How can you find out more about it?

Agriculture depends on workers and businesses. Even more, it depends on Earth's natural and renewable resources. Build the word puzzle and see what these resources are!



Sun, Soil, Plants, Air, Water, Animals, Environment

A _____

- Rancher
- Forester
- Seed grower
- Veterinarian
- Farmer
- Biotechnologist
- Greenhouse manager
- Gardener
- Animal geneticist
- Soil scientist
- Horticulturist
- Entomologist
- Agronomist
- Climatologist
- Plant breeder
- Viticulturist

B _____

- Food safety inspector
- Epidemiologist
- Sawmill worker
- Biochemist
- Food biosecurity specialist
- Food scientist
- Mechanical engineer
- Fashion designer
- Wood scientist
- Nutritionist
- Carpenter
- Meat scientist
- Microbiologist
- Food processors

C _____

- Exporter
- Truck driver
- Highway engineer
- Restaurant owner
- Florist
- Grocer
- Software specialist
- Ship captain
- Ad designer/writer
- Pizza delivery driver
- Farmers market vendor
- Food store inspector
- International trade advisor
- Grain merchandiser
- Pilot

On each photograph, write the letter of the list it fits into.

Photos Courtesy University of Minnesota Agricultural Experiment Station

Celebrating... Minnesota Agriculture

Agriculture is Minnesota's second leading industry behind only manufacturing. Agriculture represents over 342,000 jobs (10% of Minnesota jobs) and billions of dollars in our state. Whether you live in the city or country, it's a sure bet many of your friends or neighbors and maybe even you rely on agriculture for jobs.

What food, fiber, turf/landscape or forest businesses are in your community? Do you know anyone who works for an ag business—or on a farm?

Match each company/organization to the raw (direct from the farm or soil) and processed products.

A **logo** is a sign or symbol that stands for a company. Circle the ag business logos you might see in your kitchen.

List three or more agribusinesses in your community. What education or special training would you need to work there? Investigate! What careers might you find in the agribusinesses below?

Agribusiness	Raw Product	Processed Product
1. Gold'n Plump	hogs	packaged chicken
2. Hormel	trees	sugar
3. Minn-Dak Sugar	oats	potato chips
4. John Deere	chicken	cereal and snacks
5. Boise	steel	pepperoni and ham
6. Kemps	sugarbeets	farm machinery
7. Pioneer	corn seed	ice cream
8. Old Dutch	potatoes	paper
9. Malt-O-Meal	milk	ethanol

Watching the Weather

Minnesota's 2013 weather made headlines of all kinds: A blizzard in southeastern Minnesota in May. Winds uprooting thousands of Twin Cities trees in June. Frost in Embarrass in mid-August. A record-setting heat wave at State Fair time. Great crop-growing weather in some parts of the state. Moderate to severe drought in other areas.

For farmers, weather is a huge concern. Their business depends on it. Good weather and rainfall are vital for growing crops. Too much or too little rain, high or low temperature extremes and severe storms can mean disaster for farm crops and animals.

Meteorologists (weather forecasting experts) help farmers stay on top of unusual weather patterns. Today's farmers can use the Internet to pinpoint the weather conditions right on their farmland. In what weather situations can farmers do things to protect their crops and animals? When do they have no control at all?

How does weather affect what YOU do?

Minnesota Grown

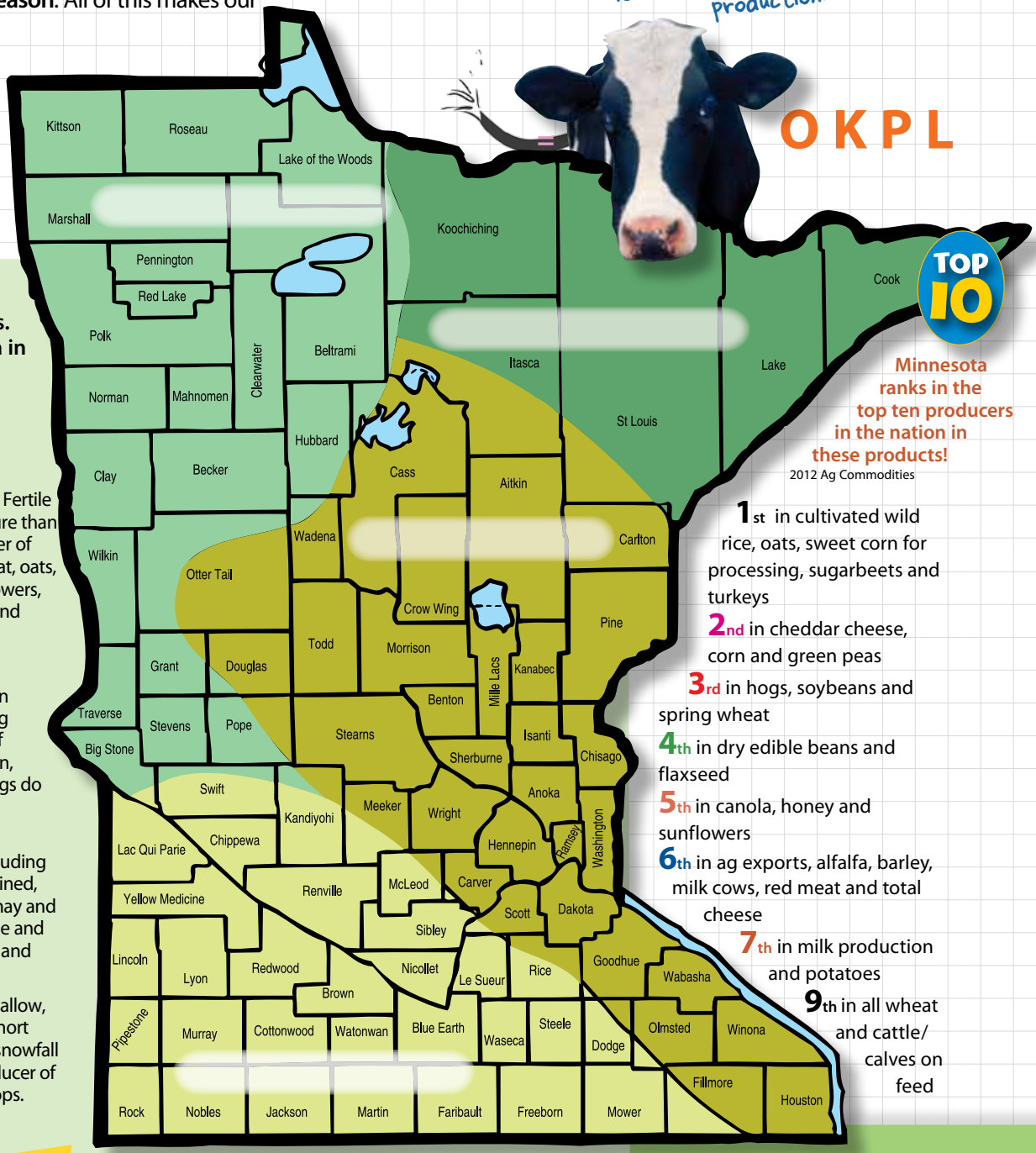
What makes Minnesota such a terrific state for agriculture? It starts with a great variety of **soil types** and **terrain** that's good for farming. Add the right weather pattern. That means the right amount of **rainfall** at the right time in the right place during our **growing season**. All of this makes our state tops in many crops!

What grows where? Check out the map and clues. You'll discover Minnesota's four main growing areas. In which do YOU live?*

Match these clues with the names of the growing areas. Write the name of each area in its space on the map.

Clues

1. Flat terrain where large machinery can operate. Fertile prairie soils. Less moisture than other areas. Big producer of cash crops such as wheat, oats, barley, soybeans, sunflowers, sugarbeets, dry beans and potatoes.
2. Fertile soils with good moisture. More southern location (longer growing season). Big producer of crops and livestock. Corn, soybeans, cattle and hogs do well here.
3. Hilly terrain with good moisture. Soils vary, including rich, shallow, poorly drained, sandy. Big producer of hay and pasturelands, dairy cattle and turkeys. Other livestock and garden crops, too.
4. Rough, rocky terrain. Shallow, less fertile forest soils. Short frost-free season. High snowfall adds moisture. Big producer of forests, but few field crops.



* You'll find crops and livestock in every part of Minnesota, but this map shows their main growing areas.

Growing Areas

A Northeast **B** Southwest **C** Northwest **D** Central/Southeast

Unscramble the letters to name the Minnesota county that leads the nation in sugarbeet production.

O K P L

TOP 10

Minnesota ranks in the top ten producers in the nation in these products!

2012 Ag Commodities

1st in cultivated wild rice, oats, sweet corn for processing, sugarbeets and turkeys

2nd in cheddar cheese, corn and green peas

3rd in hogs, soybeans and spring wheat

4th in dry edible beans and flaxseed

5th in canola, honey and sunflowers

6th in ag exports, alfalfa, barley, milk cows, red meat and total cheese

7th in milk production and potatoes

9th in all wheat and cattle/calves on feed

Glossary

Livestock and Crops: *Agricultural animals and the crops farmers raise mainly to feed them.*

Cash Grains: *Crops farmers raise to sell for money.*

Stearns County has more top ten commodity production rankings than any other Minnesota county!

One bushel of whole wheat can yield 64 one-pound loaves of bread.

An acre is about the size of a football field.

The average potato is 75 to 80 percent water.

One bale of cotton can produce 215 pairs of blue jeans.

Find it on the Map!

1. Find each county with one of its top ag products. Use this code to put colored dots on the map: green for forest products; blue for field crops or cash grains; red for dairy and livestock.

MINNESOTA GROWN™

County	Ag Product	County	Ag Product	County	Ag Product
Marshall	Wheat	Martin	Hogs	Koochiching	Paper
Jackson	Soybeans	Morrison	Beef cattle	Aitkin	Bluegass seed
Wabasha	Green peas	Otter Tail	Bison	Kandiyohi	Turkeys
Clay	Sugarbeets	Anoka	Sod	Pipestone	Sheep
Stearns	Dairy	Polk	Dry beans	Todd	Oats
Faribault	Corn	Roseau	Canola	Sherburne	Potatoes
St. Louis	Wood products	Isanti	Christmas trees	Wright	Honey
Fillmore	Hay	Brown	Sweet corn	Kittson	Sunflowers
Washington	Apples	Norman	Barley	Goodhue	Alpacas

A growing number of these animals are being raised in Minnesota for fiber.

Name the animal.

_____

2. Look at your dots. What do you notice about where things grow in Minnesota? Unscramble the letters to discover five things that make each growing area different from the others.

Hint: *All the words appear somewhere on pages 4 and 5.*

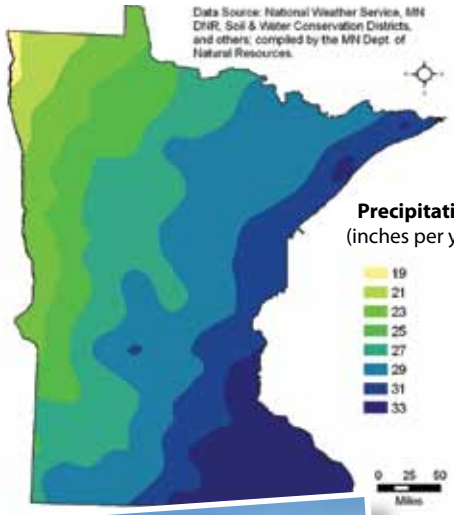
iosl yptes _____ rraiten _____

thwaeer _____ gingorw saseno _____

llafinar _____

Minnesota Rainfall: What and Where?

Average Annual Precipitation (rain and snow)



1. Which growing area of Minnesota normally gets the least rainfall each year? _____

Which area gets the most? _____

2. Why must farmers understand rainfall patterns when they choose which crops to plant?

3. What happens to farm crops when rainfall is way above normal? Way below normal?

Crop	Which Minnesota Growing Area?
Hay and Pastureland	
Sugarbeets	
Corn and Soybeans	
Forest and Pine Trees	
Wheat	

Your Turn!

Imagine you're a farmer. In which of Minnesota's four regions would it make the most sense to grow these crops? Write your answers. Then read the clues again (page 4) to check your work.

Name the crop!

Unscramble the letters to name this crop that you can find fresh, canned or frozen in your grocery store. Minnesota is a leading state in producing this crop.

e g e n r e p s a

Your Answer

Name the main growing area.

Your Answer

WWW

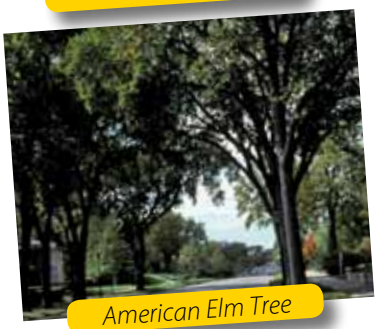
Discover the amazing world of soils with images and information from the online Dig It! exhibit at the Smithsonian's National Museum of Natural History.

Dig it! The Secrets of Soil www.forces.si.edu/soils

Ten Plants that Changed Minnesota


Alfalfa


Soybeans


American Elm Tree


Turf Grass


Apples


Wheat


Corn


White Pine


Purple Loosestrife


Wild Rice

Photos Courtesy University of Minnesota Agricultural Experiment Station

Minnesotans were asked to nominate plants that changed our state. From this list, twelve experts decided the top ten plants. Match clues to plants. How do you think each of these plants changed our state?

Clues

1. First harvested by Native Americans in canoes. Grows in water. Minnesota's state grain.

_____

2. Made Minneapolis the "Flour Milling Capital of the World." Main ingredient in breads, cereals, pasta and more.

_____

3. Once covered much of northern Minnesota. Heavily logged for timber. Favorite nesting spot for eagles and osprey.

_____

4. Native Americans grew it long before Columbus came. More than 3,500 uses today.

_____

5. Provides nutritious hay for cattle and horses. Helps prevent soil erosion.

_____

6. World's leading source of edible protein and oil. Food for humans and animals.

_____

7. For recreation and landscaping. Requires a lot of water.

_____

8. A versatile, nutritious food. Many varieties. Sometimes called "Nature's toothbrush."

_____

9. Brought here from other countries. Invasive. Big problem for wetlands.

_____

10. Valued for shade, beauty and habitat. Millions destroyed by disease in the 1970s.

_____

Try This! Imagine you are voting on plants that most impact or improve your life. What plants would be on your list?

For more about the ten plants, check out:

www. arboretum.umn.edu/10plants.aspx

Minnesota's Powerhouse Crops

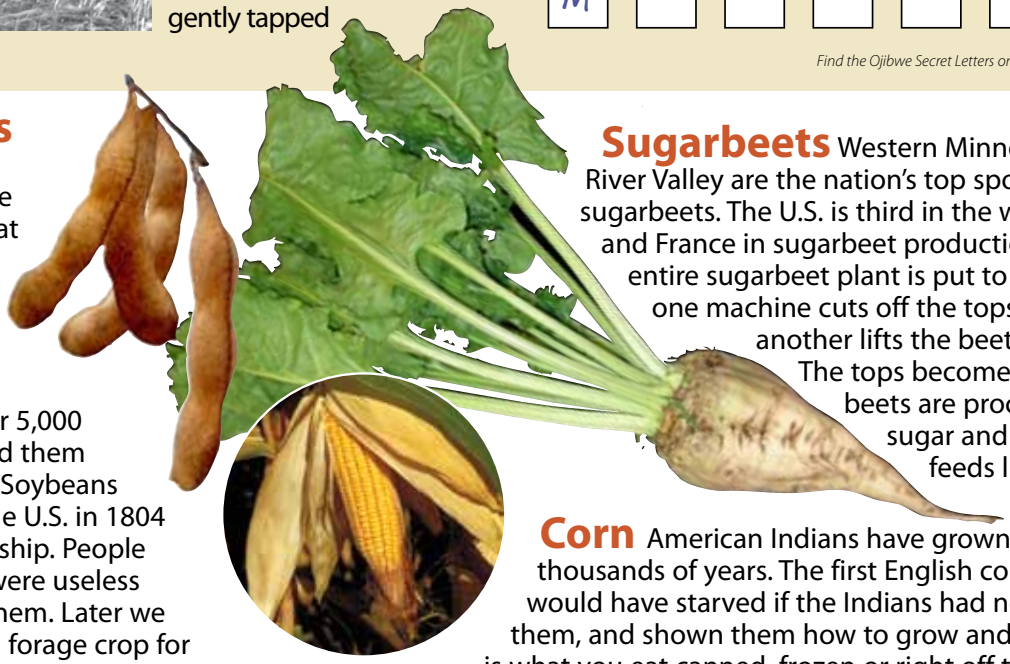
Take a ride in Minnesota farm country and you'll see an amazing variety of field crops. They thrive here thanks to our state's soil, climate and terrain. Most of our crops are used as food for people or for animals. Technology brings other uses for field crops, too. We have ink, candles and soy diesel from soybeans. We have cat litter and packing peanuts from wheat. We have skin care lotions from wild rice. We have ethanol from corn blended with gasoline. We even have warm blankets from a corn-based fabric called Ingeo. We have medicine, livestock feed and even shoe polish from sugarbeets. Read on for more about Minnesota crops!

Wild rice is a native crop. Minnesota's natural wild rice has provided food for people for over 500 years. To gather the hand-harvested rice—a special crop of northern Minnesota's shallow waters—the Ojibwe paddled canoes out to the rice. They bent the stalks of rice over the sides and gently tapped the tops of the stalks to make the rice fall into the canoes. Some rice fell into the water as seed for the next year's crop. Indians still hand-harvest the natural stand. However, more of our wild rice today grows in special water-covered fields called paddies. The water is drained off before harvesting, which is done by machine. Most of the wild rice grown in the U.S. comes from just two states: California and Minnesota.

This Minnesota county's name is the Ojibwe word for "wild rice."

22 – 2	3 × 3	17 – 4	51 ÷ 3	6 – 2	18 + 2	16 ÷ 8	85 ÷ 5
20							
M							

Find the Ojibwe Secret Letters on page 8.



Soybeans are **legumes**, members of the plant family that includes other beans, peas and lentils. The Chinese people have grown them for 5,000 years and called them "Yellow Jewel." Soybeans first came to the U.S. in 1804 as ballast for a ship. People thought they were useless and dumped them. Later we used them as a forage crop for animals. Then auto maker Henry Ford looked at soybeans as an industrial crop. A plastic steering wheel made by Ford was the first industrial use of soybeans. We learned that soybeans are not only powerhouses of protein for people and animals, but they have hundreds of uses. No wonder soybeans have been called "The Miracle Crop."

Sugarbeets Western Minnesota and the Red River Valley are the nation's top spots for growing sugarbeets. The U.S. is third in the world, after Russia and France in sugarbeet production. Did you know the entire sugarbeet plant is put to use? At harvest time, one machine cuts off the tops of the plants and another lifts the beets out of the ground. The tops become animal feed. The beets are processed to extract the sugar and leftover beet pulp feeds livestock.

Corn American Indians have grown corn (maize) for thousands of years. The first English colonists in America would have starved if the Indians had not shared corn with them, and shown them how to grow and use it. Sweet corn is what you eat canned, frozen or right off the cob, but you use products made from field corn every day. Components of field corn such as starch, syrup and oil are invisible ingredients in thousands of food products. Field corn is a major ingredient in livestock feed and industrial products, too. The U.S. is the world's largest field corn producer, consumer and exporter.

Wheat covers more of the earth's cultivated land surface than any other crop. It was first grown in Minnesota in about 1820. By the time of the Civil War wheat was a major crop. Our state's great rivers and lakes were the first shipping routes for wheat. Railroads later carried it across the nation. Meanwhile, grinding wheat into flour became a big industry. Minneapolis companies used water power from the mighty Mississippi to grind wheat into flour. Through 1930, Minneapolis was the flour milling capital of the world! Today our state's wheat helps the U.S. be the world's largest exporter of wheat.

Did you know?

Almost all our breakfast cereals are made of grass. Oats, barley, corn and wheat are all grasses.

Fast n FUN

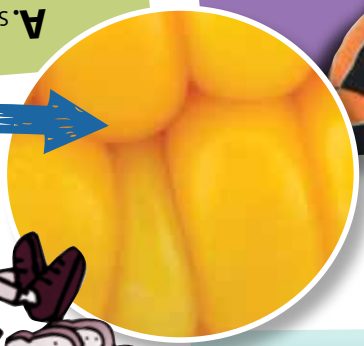
Q. If a rooster laid an egg on a slanted roof, which way would it roll?

A. No way. Roosters don't lay eggs.

Q. What does a Minnesota farmer plow but never plant?

A. Snow

What is it?



This vegetable's outside is thrown away so the inside can be cooked. But the outside of the inside is eaten and the inside of the inside is thrown away.

FUN and Food at the Fair

The All You Can Drink Milk stand at the Minnesota State Fair served 36,000 gallons of milk during the 12 days of the fair – that's 576,000 glasses.

Over 450 foods are available at 300 food concessions. How many foods were new in 2013? About 40. Cocoa cheese bites, deep fried olives, fried pickles 'n' chocolate, peanut butter and jelly malts are a few of them.

Did You Know? All the foods at the fair are connected to what? Unscramble the letters to see!

g c l r e u i t a r u

A Dozen Ways to Say Bread

Match the bread to the country.

1.	Ciabatta	United Kingdom
2.	Naan or Chapati	Norway
3.	Soda Bread	India
4.	Pita	Mexico
5.	Scone	France
6.	Injera	Poland
7.	Tortilla	Greece
8.	Lefse	China
9.	Baguette	Ethiopia
10.	Bagel	United States
11.	Wonton	Italy
12.	Johnny Cake	Ireland

Corny Counting

The kernel is the seed from which a corn plant grows. Kernels contain energy that people and plants can use. Does a cob of corn have an even number of kernel rows or an odd number?

1. Make a prediction and then test it out. Get several ears of field corn and start counting!

My prediction: _____

Actual: _____

2. Using a cob of field corn, use a ruler to help you estimate the total number of kernels on the cob. Again, predict and count. Tally answers for an official estimate. How did the ruler help in estimating?

Minnesota AgBrags

- The U.S. is the world's largest exporter of farm products. Can you name Minnesota's four biggest ag customers?

(**HINT**: These are their flags.)

USDA Agricultural Research Service

SCI4KIDS

From "farm to fork" (and even fuel), agricultural research touches our lives in surprising ways. Dig in and discover!

www.ars.usda.gov/is/kids

Page 7 Ojibwe Secret Letter Code

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

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