

**This
Business
Called
Agriculture**

Table of Contents

Changes in Agriculture.....	1	Fish.....	45
Agribusiness.....	7	Bees.....	46
Organic and Conventional Farming.....	12	Exotic Farm Animals.....	47
Soils.....	13	Animal ID and Tracking.....	48
Fruits.....	15	Rendering.....	49
Vegetables.....	17	Wisconsin Agriculture Review.....	50
Potatoes.....	19		
Specialty Crops.....	21	Glossary.....	52
Turf.....	23		
Forestry and Logging.....	24		
Christmas Trees.....	25		
Maple Syrup.....	26		
Grains.....	27		
Corn.....	28		
Soybeans.....	29		
Genetic Improvements.....	30		
Dairy Goats.....	31		
Dairy Cattle.....	32		
Veal Calves.....	36		
Beef Cattle.....	37		
Pigs.....	39		
Sheep.....	40		
Horses.....	41		
Poultry.....	42		
Furs.....	44		



Produced by Wisconsin Ag in the Classroom

For additional cost-free educational resources, visit
WisAgClassroom.org

Changes in Agriculture

In this chapter, I will...

- learn that each farmer feeds more people today than they did in the past because of improvements in agricultural technology and machinery.
- explore the difference between imports and exports.
- use problem solving to create a pattern showing how crop rotation works.

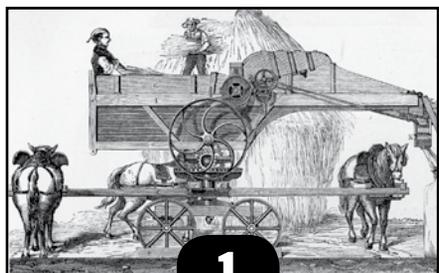
Agriculture is the production of food and **fiber** through the growing of crops and raising of animals. It has been around a long time, even since the days of pharaohs in Egypt. Yet, agriculture didn't change very much until the last 200 years.

In the early 1800s, American farmers began to use new discoveries and machines to help produce food. The better farmers became at producing food, the more people they were able to feed.

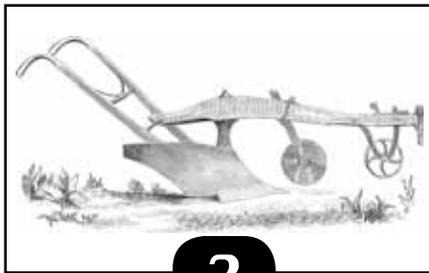
In 1820, a farmer, with the help of a work horse or ox, could grow enough food to feed four people. That was just enough for one family so many people had to grow their own food. New inventions, like the steel plow, reaper, and threshing machine, helped the farmers in 1870 **till** more land. A farmer could then feed five people.

Try it!

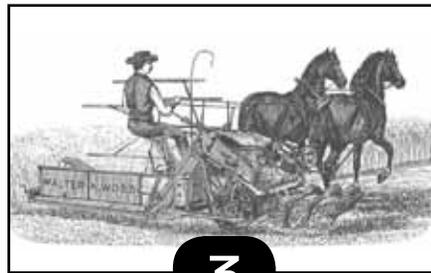
Match each description to the correct picture.



1



2



3

___ Turning the soil was the job of the **steel plow**. Pulled by a draft horse or ox, the steel plow could cut through the tough sod.

___ The **reaper** was a harvesting machine for grain. The horse would pull the reaper through the field to cut the crop. The farmer then gathers the grain.

___ Separating the grain from the stalks was the job of the **threshing machine**. Horses would provide the power to turn the wheel which would crush the stalks, allowing the grain to drop free.

What do farmers use today that replaced these machines? Do an interview or conduct research using the library or the internet to find out.



Changes in Agriculture

In the 1920s, scientists discovered ways to help plants fight disease and produce more **grain** per plant. These new plants were called **hybrids**. Using hybrids, American farmers could produce enough food to send some to other countries as **exports**. Each farmer was feeding eight people.

Try it!

Today we depend on a global supply for our food, clothing, and shelter. **Imports** are items bought from another country to ours. Exports are items produced in the U.S. and sold to another country.

List items the U.S. imports and exports.

Imports	Exports
.....
.....
.....
.....



Circle the items Wisconsin exports.



Changes in Agriculture

Gas-powered tractors began helping farmers in the 1930s. These tractors were faster than horses and didn't need to be rested, watered, or fed. Using tractors helped increase the number of people each farmer could feed to 19.

In the 1950s, new medicines helped keep animals healthy and farmers learned better ways to **conserve** their **soil**.

Just as we need vitamins and minerals from our food to grow, plants need **nutrients** from the soil to grow. Phosphorus, nitrogen, potassium, and calcium are some of the nutrients that food crops need.

Early farmers would plant the same crops in their fields year after year. Soon the nutrients in the soil would be used up, causing plants that grew there to be small and weak. Farmers needed to add nutrients back into the soil. They began to add animal waste or manure, decayed plants, and **fertilizer** to the soil to provide nutrients for the crops.

Try it!

Crops need different nutrients. Use the *Growing Guide* to analyze which crops you could plant in each field.

Growing Guide

Plants need the following nutrients to be strong and healthy:

Corn	Potatoes	Wheat
2 N	2 N	1 N
1 P	2 P	1.5 P
1 K	2 K	1 K
	1 Ca	

Key

Ca = Calcium P = Phosphorus
N = Nitrogen K = Potassium

	Nutrients in the Field	Crops I could Plant
Field 1		
Field 2		
Field 3		

Changes in Tractors



early 1900s



early 2000s

The first engine tractors in 1868 were steam-powered. In 1892, tractors with gas engines were introduced.

How else have tractors changed over the years?
On a different piece of paper, compare and contrast how tractors have changed over the last 100 years.



Changes in Agriculture

Farmers also began to practice **crop rotation**. The first year they would plant oats, the next year **harvest** hay, and the following year grow corn. Each plant used different nutrients so the soil was not worn out and nutrients would be replenished.

These changes meant a farmer in the 1950s could feed 27 people. Fewer people had to produce food so more people could move to the cities and take jobs in manufacturing, health care, education, and other areas. By 1960, each American farm worker was producing enough food and fiber for 61 people.

New machines for better planting and harvesting, new fertilizers and chemicals to feed and protect plants, better health care and housing for livestock, and many more improvements helped the farmer in 1970 feed 72 people.

Crop rotation can have different benefits and challenges.

Benefits

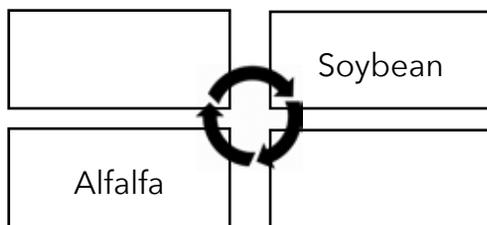
- Better **yields**
- Replenish nutrients
- Helps control weeds, insects, and plant diseases
- Increases **organic matter**

Challenges

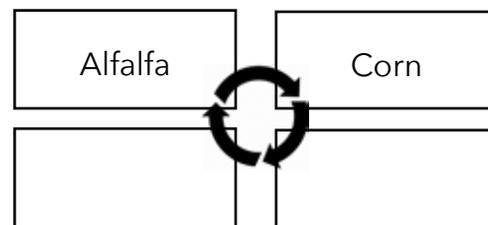
- Takes longer to prepare the fields when changing between crops
- Need more equipment to plant and harvest the different crops

Try it!

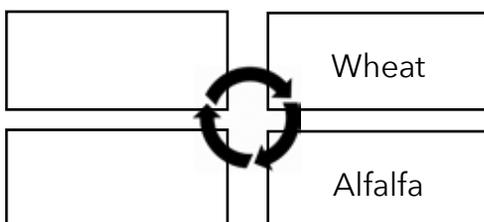
Complete the pattern to show the crop rotation. Each year can have only one field of corn, wheat, soybean, and alfalfa. A box represents a field.



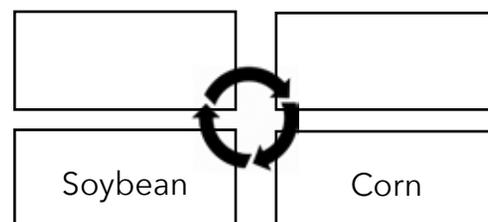
Year 1



Year 2



Year 4



Year 3



Changes in Agriculture

In the 1980s, farmers began to use more **biotechnology**. By studying the way living plants and animals grow, fight disease, and reproduce, scientists learned how to help farmers produce more food. Through biotechnology, the farmer has continued to grow enough food to feed the ever expanding population. The 1980s farm worker provided farm products for 112 people.

Researchers today are looking at tiny complex elements called **genes**. Genes pass characteristics from parents to offspring. By learning more about genes, researchers help farmers improve their animals and crops. This scientific advancement increased the number of people each farmer could feed from 129 people in the 1990s to 139 in the 2000s. This number has continued to grow. Farmers in the 2010s could now feed 155 people.

Precision Agriculture

Beginning in the mid-1990s, farmers began to manage their farms using **precision agriculture**. This is the use of technology to help increase a farm's **profits** and efficiency while protecting the environment. **Drones** and the use of **global positioning software (GPS)** in tractors and on farm equipment are examples of technology used in precision agriculture. Some tractors with GPS can even steer themselves!

Agriculture is continuously changing. Write or draw a prediction on how you think it will change in the next 25 years.



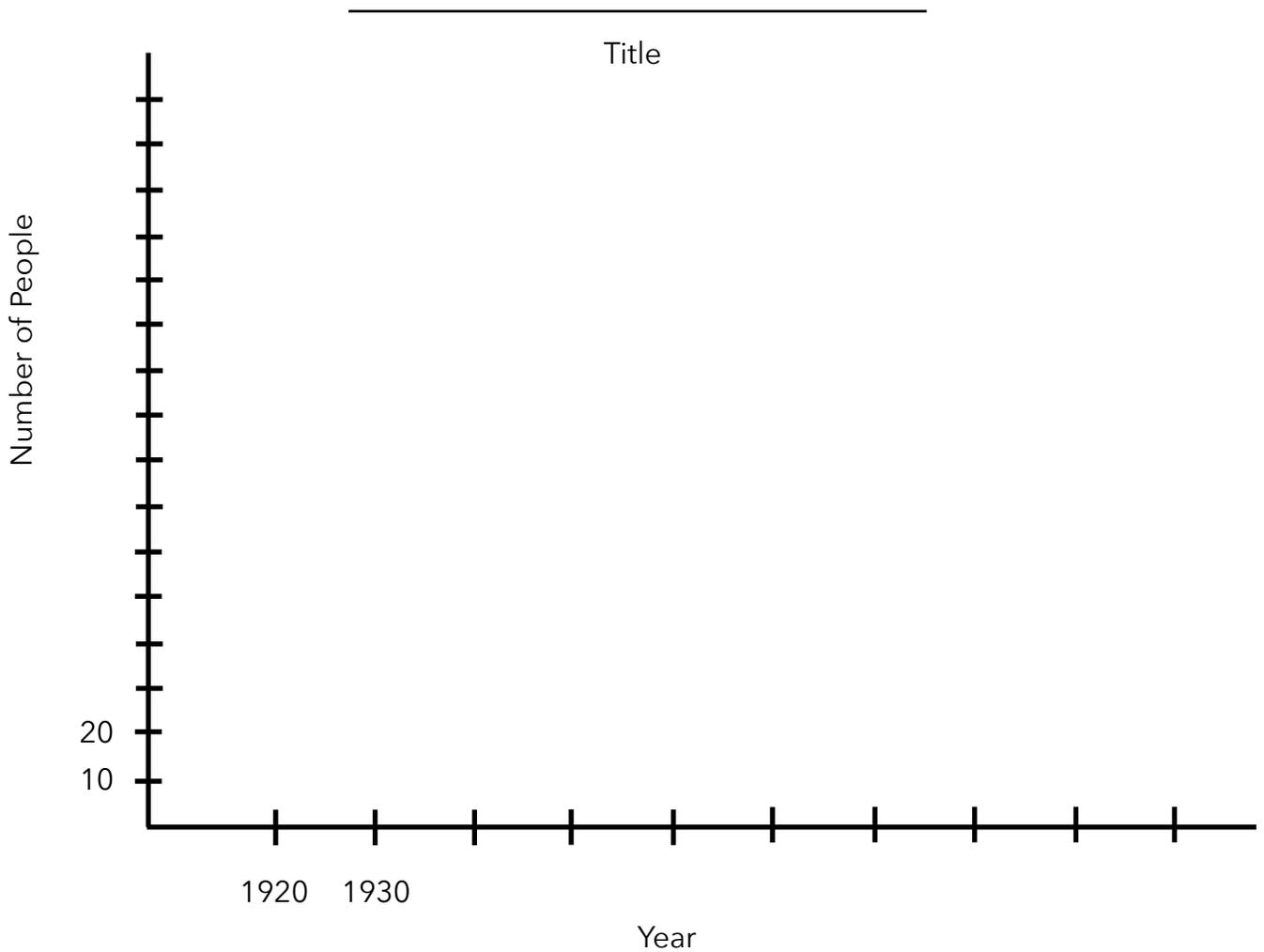
Drones are sometimes used to help farmers manage their crops. These machines are also called unmanned aerial vehicles (UAVs). A camera on the bottom of the drone takes an aerial photo of the field, showing where soil issues, weeds, or sick plants are located. Some drones are flown using a remote control while others have autopilot.



Changes in Agriculture

Try it!

Use the information in this chapter to create a line graph to show the average number of people each farmer could feed during the last century.



Analysis

What do you learn from your graph? _____

Predict how many people each farmer can feed in the year 2030. _____



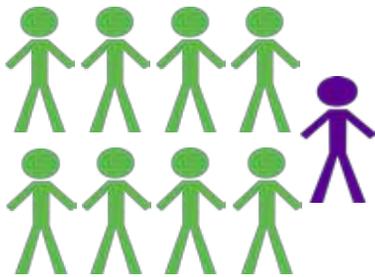
Agribusinesses are businesses that prepare, package, transport, and sell farm products. They provide farmers with **inputs** that farmers use to produce **outputs** such as milk, crops, and animals. Seed companies and machinery manufacturers are examples of agribusinesses.

In this chapter, I will...

- learn the definition of agribusiness.
- research which agribusinesses are in my community.
- create a cooperative with my class to discover how a cooperative works.

Wisconsin Agribusiness

1 in every 9 jobs
in Wisconsin are related to agriculture.



Name agribusinesses in your community.

Try it!

Below are careers in agribusiness.
Match each career to its definition.

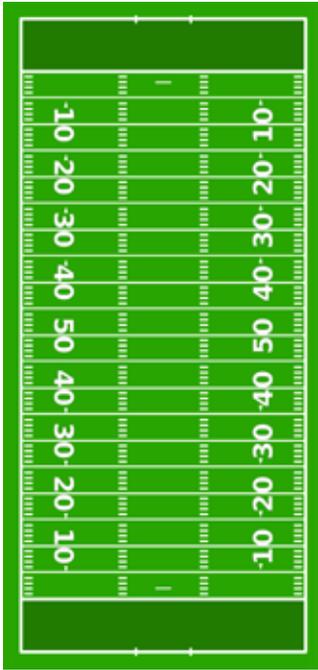
- | | |
|------------------------|---------------------|
| A. Agriculture Teacher | F. Mechanic |
| B. Agronomist | G. Researcher |
| C. Banker | H. Veterinarian |
| D. Food Scientist | I. Wildlife Manager |
| E. Forester | |

- ___ treats animals for diseases and injuries
- ___ teaches students about agriculture
- ___ helps farmers grow crops using science
- ___ uses science to find ways to store, package and prepare foods safely
- ___ repairs the equipment used by farmers and other agribusinesses
- ___ loans money to farmers and other agribusinesses to buy what they need
- ___ manages the wild animals that live in the forest
- ___ develops new ways to raise and use crops and animals through research
- ___ works with trees in the places they grow



Agribusiness

Math is important in agriculture. Farmers often have to calculate how much to feed their animals or how much seed to buy for their fields. Some common units of measure in agriculture are **acre**, **bushel**, and **gallon**.



Land is often measured in acres. An acre is about the size of a football field.



Grain (wheat, corn, etc.) is sold by the bushel. A bushel is about the size of a laundry basket.



Milk is sold in the store in gallons. There are about 9.3 gallons in a bushel.

Career Spotlight

Job Title:
Agricultural Engineer

Duties:
Design agricultural equipment using computers
Test agricultural equipment

Average Salary in 2015:
\$75,090

Skills Needed:
Math, Problem Solving, Science, and Communication

Education Required:
At least a Bachelor's Degree (4-5 year degree from a university)

Source: United States Department of Labor, Bureau of Statistics. www.bls.gov



Try it!

Solve these problems. Show your work.

1. One bushel of corn will make 56 boxes of cereal. If your family ate 2 boxes of cereal a week, how many weeks would one bushel of corn feed your family breakfast?
2. In Wisconsin, a cow produces on average 2,639 gallons of milk each year. From her milk, 2,243 gallons are made into cheese, 20 gallons are used for ice cream, and 91 gallons are used for yogurt. The remaining milk was used for drinking. How many gallons were left for drinking?
3. You spent \$1.00 at the grocery store. The store kept \$0.18, the trucking company got \$0.07, \$0.23 went for packaging and advertising, and \$0.35 went to the store employees. The rest went to the farmer. How much did the farmer earn from the \$1.00?
4. If a tractor can plant 8 acres in an hour, how many hours will it take for the farmer to plant a 209-acre farm?

Fun Fact The average farm size in Wisconsin is 209 acres in 2015.



Agribusiness

Are there any **cooperatives** in your community?

Cooperatives are businesses started and run by the people who use them. It is a way for people to work together to reduce their expenses, get better prices for their products, or receive new or better products or services.

People that belong to cooperatives are called members. They share the profits made by the business based on how much they use the cooperative's services. People buy a share of stock or pay membership fees to become members of a cooperative.

Fun Fact

These businesses are agricultural cooperatives:

Riceland Rice
Sunkist Oranges
Welch's Grape Juice
Ocean Spray Cranberry Juice
Blue Diamond Almonds
Norbest Turkey
Sun-Maid Raisins
Tree Top Apple Juice
C & H Sugar
Sue Bee Honey

Try it!

Pretend your class is going to form a cooperative. Answer the following questions as a class.

1. What type of business is your cooperative? (grocery store, credit union, etc.)
2. How much does it cost to join your cooperative?
3. How many people are members of your cooperative?
4. How much did your cooperative collect in membership dues?
5. Cooperatives have a Board of Directors. Elect the following positions:
President _____ *Vice President* _____
Secretary _____ *Treasurer* _____
6. At the end of the first year, your cooperative has \$120 in its savings account. How much does each member receive?



Try it!

Use your creativity to develop your own agribusiness for your community! Respond to the following.

What agribusinesses are already present in your community?

What agribusiness would your community find useful? Why?

Write a detailed description of your agribusiness.

What is your agribusiness called?

Where in your community is your agribusiness located?

Create an advertisement for your agribusiness.

A large rectangular area enclosed by a dashed black line, intended for students to draw or write an advertisement for their agribusiness.



Organic and Conventional Agriculture

In this chapter, I will...

- list characteristics of organic and conventional farming.
- discover the difference in organic products levels.

Organic agriculture is a **sustainable** system of farming. In this type of agriculture, farmers follow the United States Department of Agriculture's (USDA) organic standards to raise animals and grow crops. Some of these standards include not using genetically modified seeds to grow crops and feeding livestock organic feed. Organic farming avoids most **synthetic** inputs, like synthetic

pesticides. Instead, organic agriculture uses pesticides included in the USDA organic standards.

Conventional agriculture is another sustainable system of farming. Unlike organic farming, conventional farming can use any pesticide (synthetic or not) and grow any type of seed (genetically modified or not). Animals grown on conventional farms can also eat feed that is or isn't from genetically modified crops.

Try it!

Write characteristics of organic and conventional agriculture.

Organic Agriculture

- 1.
- 2.
- 3.

Conventional Agriculture

- 1.
- 2.
- 3.

Organic Product Levels

There are four different levels of organic certification for products:

- **100% Organic**
All ingredients are certified organic; can use USDA organic seal
- **Organic**
Made with at least 95% certified organic ingredients; can use USDA organic seal
- **Made with Organic Ingredients**
Made with at least 70% certified organic ingredients; cannot use USDA organic seal
- **Specific Organic Ingredients**
Made with less than 70% certified organic ingredients; cannot use USDA organic seal



Fun Fact

Wisconsin is #1 in the U.S. for organic dairy production.



In this chapter, I will...

- discover how soil is formed.
- identify three sizes of soil: sand, silt, and clay.
- use a map to learn which type of soil is present in my county.

Soil is made when rocks are broken down by climatic factors such as rain and snow. Extreme hot and cold temperatures also helps form soil. The rock particles mix with decaying plants to form soil. It takes over 500 years to form one inch of soil.

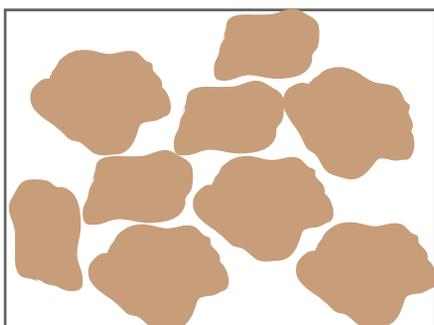
Fun Fact

Wisconsin's state soil is Antigo Silt Loam. It is named after the city of Antigo in northern Wisconsin. The soil is mainly found in north central Wisconsin.

Try it!

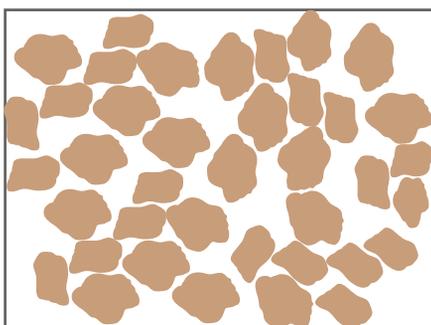
Learn about the different sizes of soil and answer the questions.

Clay, sand, and silt are three common sizes of soil particles.



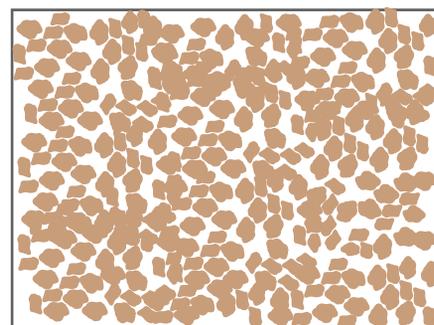
Sand

Particle Size: 0.05mm-2mm



Silt

Particle Size: 0.002mm-0.05mm



Clay

Particle Size: less than 0.002mm

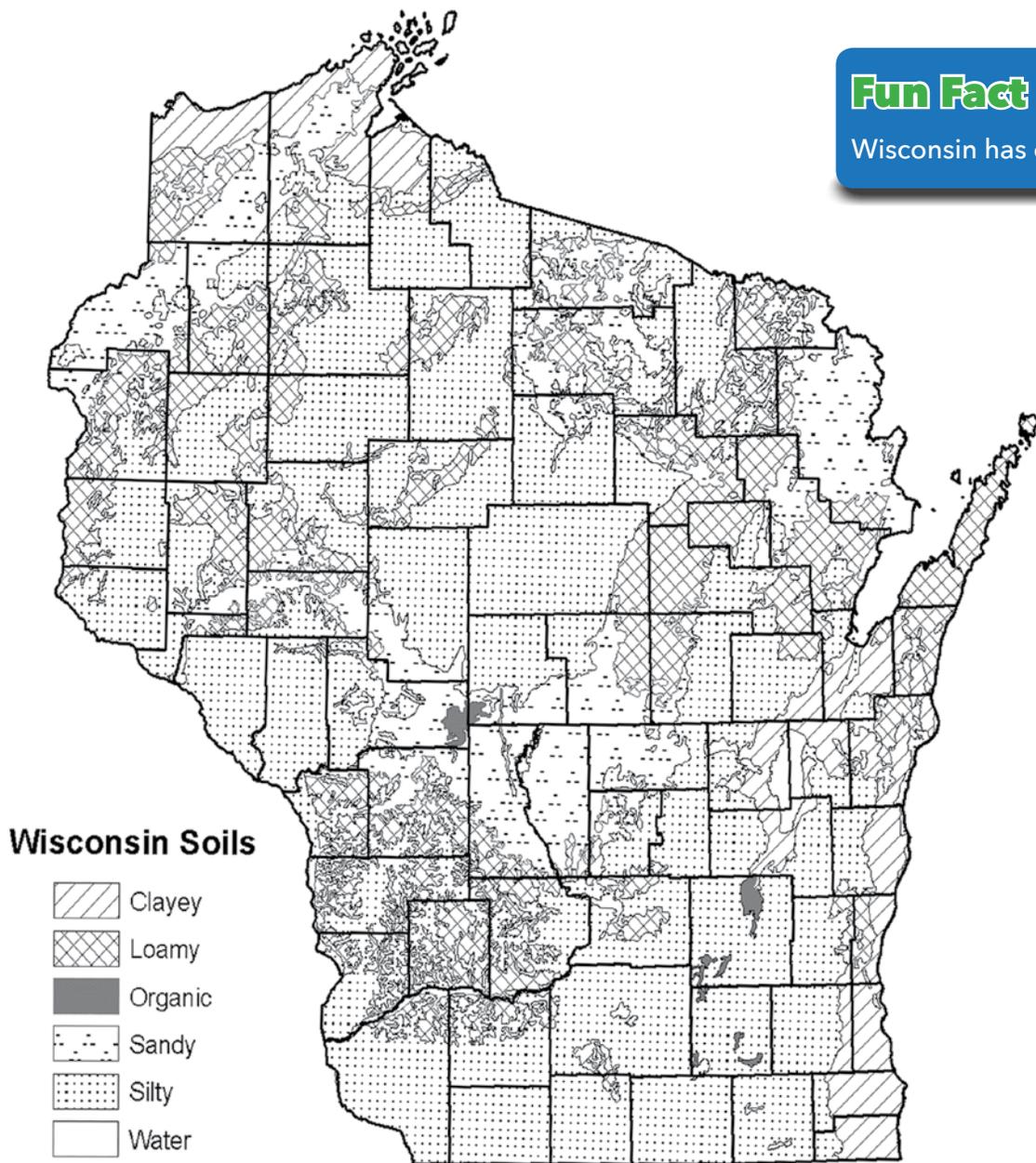
1. Which soil particles are the smallest?
2. Which soil particles are the largest?
3. Which soil particles would water move or drain through easiest? Why?
4. Which soil would compact the most? Why?



Soils

Fun Fact

Wisconsin has over 800 types of soil.



Try it!

Using the map, record which soil types are found in each of these counties.

Door County _____

Clark County _____

Milwaukee County _____

Your County _____



In this chapter, I will...

- investigate the various fruits grown in Wisconsin.
- convert pounds to tons and acres to square miles.
- learn about cranberry bogs.

Wisconsin's climate is favorable for growing apples, cherries, cranberries, and strawberries.

Apple **harvest** often takes place from August to October each year. Many orchards can be found in the counties of Crawford, Door, Bayfield, and Milwaukee.

Door County grows more than 95% of Wisconsin's cherries, which are harvested in mid to late July. Cranberries are grown in approximately 20 counties in central and northern Wisconsin. Harvest usually begins in late September.

Strawberries are grown throughout Wisconsin. The berries are usually ready to be picked from June to mid-July.

Try it!

Convert the information in the table below to pounds, tons, acres and square miles.

2015 Wisconsin Fruit Harvest				
Crop	Pounds Harvested	Tons Harvested	Acres Harvested	Square Miles Harvested
Apples	51,500,000		4,000	
Cherries	9,300,000		1,700	
Cranberries		242,800		31.56
Strawberries		1,700		0.95

Source: USDA NASS, 2015 Wisconsin State Agriculture Overview.

Ton

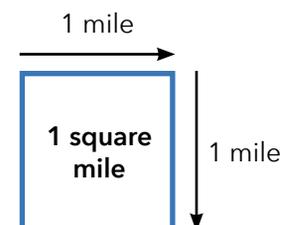
- unit of measure for weight
- 2000 lbs = 1 ton



a small car weighs about 1 ton

Square Mile

- unit of measure for area
- 640 acres = 1 square mile



about 484 football fields fit in 1 square mile



Try it!

Use your prior knowledge to complete the following facts about Wisconsin fruits. Each fruit will be used once.

Word Bank

apples cherries cranberries strawberries

1. The Algonquian Indians of Wisconsin called _____ "atoqua." Pilgrims called them "crane berry" because the pink blossoms reminded them of the heads of cranes.
2. _____ grow in orchards, and it usually takes three years before the trees bear fruit. This fruit floats because 25% of its volume is air!
3. On average, there are 200 seeds on each _____. It is the only fruit with seeds on the outside.
4. It can take 4-5 years before trees produce a _____ harvest. Door County accounts for over 95% of Wisconsin's production of this fruit each year.

Fun Fact

Wisconsin is the top cranberry producing state in the U.S.

Cranberry Bogs

A **bog** is a type of wetland. Cranberries grow well in **beds** made of alternating layers of sand, peat, gravel and clay in the bog. The berries grow runners that spread over the bog's floor.

Cranberries can be harvested using either a wet or dry method. For the dry method, the berries are picked from the plant's stem. When using the wet method, farmers flood the bog with about 18 inches of water. Machines then churn the water, shaking the berries loose from the plant. Cranberries have a small pocket of air in them, which enables them to float. The fruit is then gathered from the water's surface.



This bog has been flooded. The cranberries will next be shaken off the plant

Can you tell the cranberries are floating? These farmers are harvesting cranberries using the wet method.



Vegetables

Wisconsin is a lot like a grocery store for the U.S. We are important producers of many vegetables including carrots, cucumbers, green peas, snap beans, and sweet corn.

In this chapter, I will...

- identify and draw pictures of vegetables grown in Wisconsin.
- compare the nutritional value of vegetables.

Crop	Harvested for Processing in 2015 (tons)	Rank in the U.S.
Carrots	97,730	1
Cucumbers	32,890	<i>not ranked</i>
Green Peas	81,120	3
Snap Beans	329,530	1
Sweet Corn	490,230	3

Source: USDA NASS, 2015 Wisconsin State Agriculture Overview.

Try it!

Name each vegetable described, and draw a picture of it in the box.

Word Bank

cabbage carrot cucumber lettuce onion green peas snap beans sweet corn

1. _____

This long, green vegetable is used to make pickles.

2. _____

The vitamin carotene from this orange root is good for your eyesight.

3. _____

This vegetable grows on a cob.

4. _____

This green vegetable grows in pods.

5. _____

This vegetable grows in a head and is used to make sauerkraut and coleslaw.

6. _____

This vegetables ends are "snapped" off before cooking.

Fun Fact

Wisconsin produces 33% of the U.S. carrot supply.



Vegetables

Most of the vegetables and fruits produced on Wisconsin farms are canned, frozen, or bottled before they are delivered to your grocery store. This prevents spoiling so produce can be stored longer and transported farther. In fact, fruits and vegetables processed in Wisconsin are shipped to every state in our nation and to foreign countries.

Canning, freezing, and bottling are done at processing plants. Processing allows us to enjoy fruits and vegetables all year round, even though they are only grown and picked during the summer. It keeps our produce safe to eat.

Fun Fact

Wisconsin is 2nd in the U.S. for all major processing vegetables.

Try it!

Use the chart below to answer these questions.

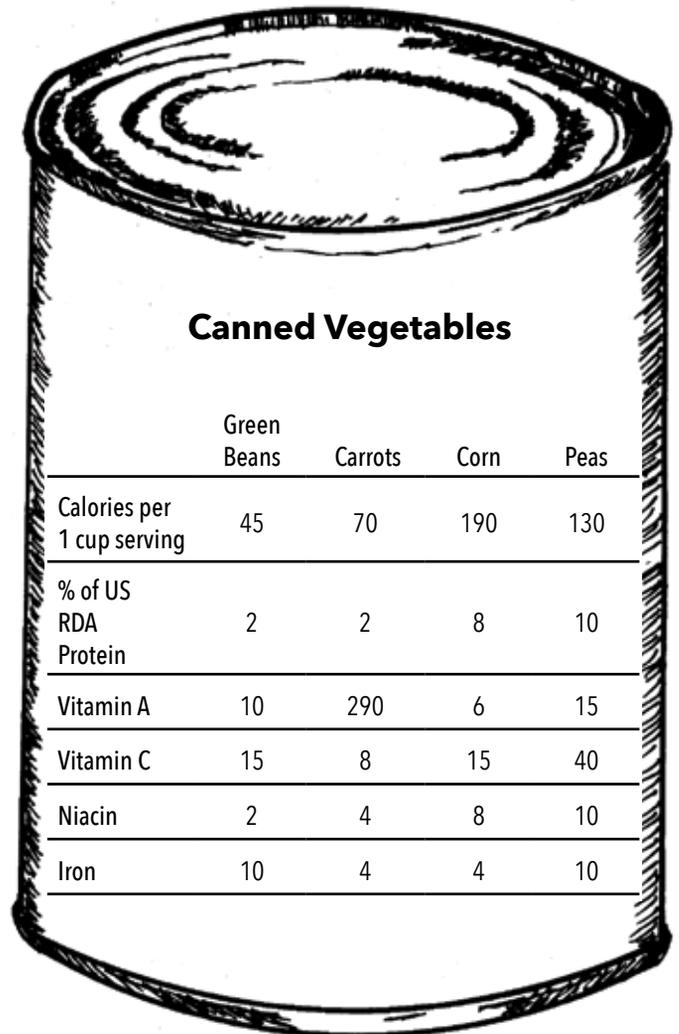
1. Which canned vegetable on the chart is lowest in calories?

2. Carrots have a high amount of this vitamin which is good for your eyesight.

3. Name the vegetable on our chart that has the most vitamin C.

4. Iron helps blood cells carry oxygen to all parts of the body. Which vegetables on the chart are highest in iron?

5. Calories provide energy. What canned vegetable on our chart provides the most energy?



Canned Vegetables

	Green Beans	Carrots	Corn	Peas
Calories per 1 cup serving	45	70	190	130
% of US RDA Protein	2	2	8	10
Vitamin A	10	290	6	15
Vitamin C	15	8	15	40
Niacin	2	4	8	10
Iron	10	4	4	10



Potato History

The Western world was not introduced to the potato until the late 1540s when the Spanish conquistadors tramped through Peru in search of gold. It took nearly four decades for the potato to spread to the rest of Europe. Eventually, agriculturalists in Europe found potatoes easier to grow and cultivate than other staple crops.

Potatoes had been introduced to the United States (U.S.) several times throughout the 1600s. However, they were not widely known until Scottish-Irish immigrants planted them in New Hampshire in 1719. From there, growing potatoes spread across the nation.

In the 1850s, most people in the U.S. considered the potato food for animals rather than for humans. Today, the potato is so common it is taken for granted. We forget that it has only been with us a few hundred years.

Wisconsin Potatoes

Many of Wisconsin's potatoes are grown in the Central Sands, which is in the central part of the state. As the name suggests, the soil in this area is sandy. This allows for good drainage, but many farmers in this area must irrigate their crops to ensure the plants have adequate moisture. Portage, Langlade, Waushara, and Adams counties are the top potato producing counties in the state.

In 2015, over 62,500 acres of potatoes were harvested in Wisconsin. Production totaled 2,750,000,000 pounds.

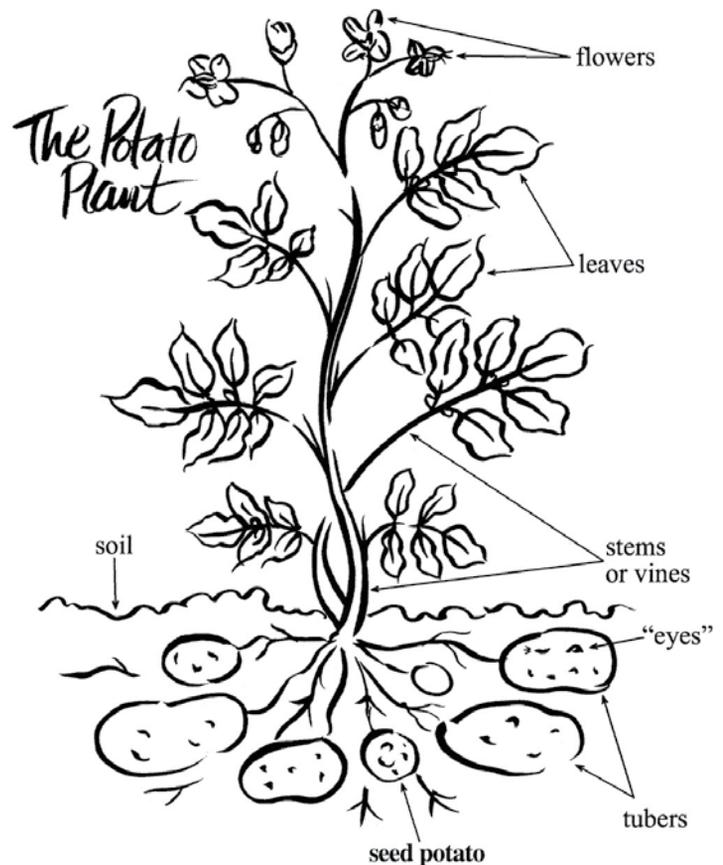
Source: USDA NASS, *Quick Stats*.

Fun Fact

Potatoes became the first vegetable grown in space in 1995. Researchers at NASA and UW-Madison created the technology so that astronauts could grow their own food during long trips.

In this chapter, I will...

- complete a close read to learn about the history and impact of potatoes in Wisconsin.



Potatoes are **tubers**. They grow underground from cut-up pieces of potatoes called a seed potato. Each piece has to have at least one eye to sprout.

Potatoes

Try it!

Follow the below steps and answer the questions to complete a close read with the text on page 19.

1. Write a one sentence prediction on what the text is about. What evidence do you have to support your prediction?
2. **Read the text.** Underline important information to annotate the text as you read.
3. What is this text mostly about? Write a two sentence summary using evidence from the text.
4. **Read the text** again.
5. Circle 3 to 5 important words in each section (Potato History and Wisconsin Potatoes).
6. Choose one word you do not know from the text. Write its definition.
7. **Read the text** again.
8. What was the purpose of this text? What did the author want you to learn?
9. What additional questions do you have after reading this text? Write at least two questions.



In this chapter, I will...

- identify the specialty crops produced in Wisconsin.
- create pie charts to compare Wisconsin and other states' specialty crop production.

Wisconsin farmers raise many **specialty crops**. These are crops you may have never heard of or possibly just didn't realize were grown in our state. Some of the specialty crops grown include ginseng, horse radish, mint, shiitake mushrooms, and wild rice.

Fun Fact Wisconsin ranked #1 in the U.S. for growing beets for processing in 2014.

Try it!

Write the number in the box to match the picture with its description.

1. This grain is **aquatic** which means it grows in the water. American Indians first harvested it in Wisconsin.

shiitake mushrooms



2. This root is in the mustard family and can be used as a relish on hotdogs.



horse radish

3. This exotic plant originated in China and Japan. It is grown on hardwood logs by about 300 Wisconsin farmers.

wild rice



Specialty Crops

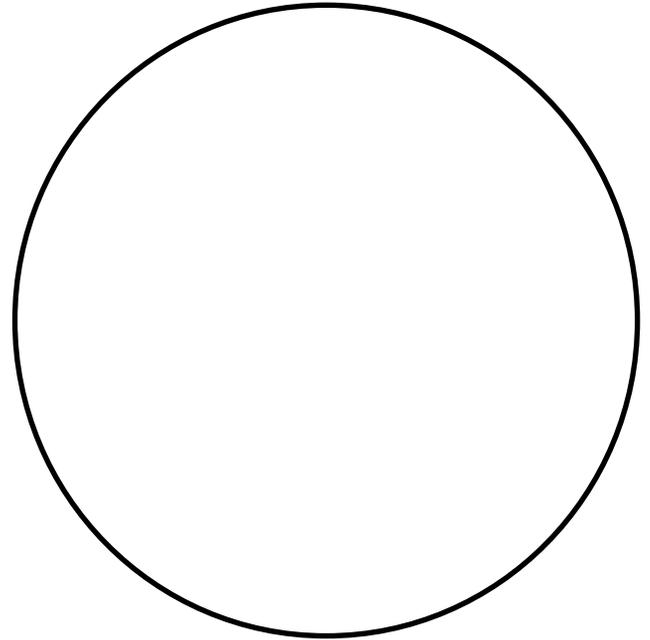
Try it!

Complete the tables and then create a pie using the data.

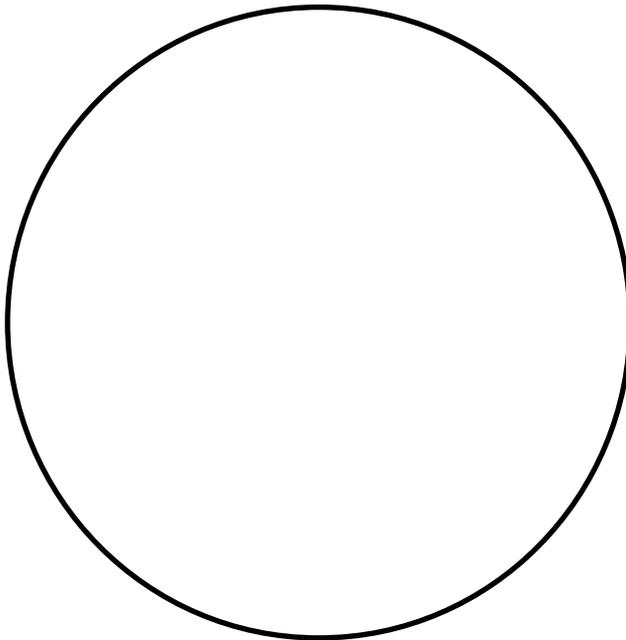
Ginseng Production in U.S., 2012

State	Harvested (acres)	Percentage of Total
New York	39	
Wisconsin	267	
Other States	67	

Total Harvested in U.S.: 373 acres



Title _____



Title _____

Mint Production in U.S., 2012

State	Harvested (pounds)	Percentage of Total
Idaho	1,935,626	
Indiana	572,469	
Oregon	2,479,178	
Washington	3,257,479	
Wisconsin	302,463	
Other States		

Total Harvested in U.S.: 9,260,236 pounds

Source: USDA NASS, Quick Stats.



In this chapter, I will...

- discover what turf is and its importance.
- create a community and calculate the amount of turf in it.

Not all crops are food! What do you see growing around your house, on golf courses, in parks, at school, on ball fields and just about everywhere you look?

You can call it grass, lawn, sod, or **turf**. It is made of green leaves above the ground and a root system below the ground.

Like trees, turf absorbs carbon dioxide and releases oxygen which people and animals need to breathe. Turf also catches and absorbs rainfall, holding water in place so it doesn't runoff or cause **erosion**. As water flows through the grass and its roots it is cleaned before it reaches the underground **aquifer**. This is important as many of us get our drinking water from these aquifers.

Lawns also act like air conditioners and filters, cooling us down in the summertime and catching dust and dirt released in the air.

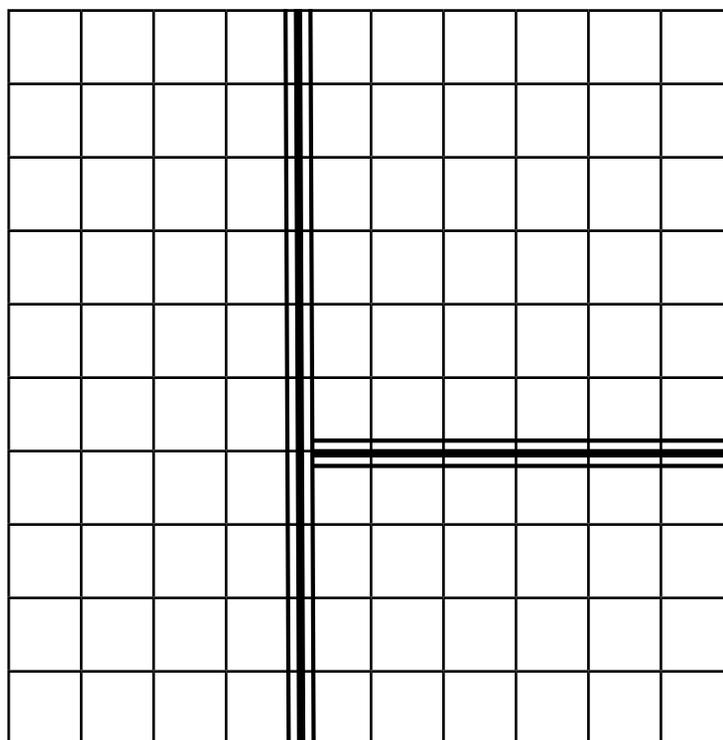
Some farms in Wisconsin grow sod to be sold to the public. In 2014, there were 34 Wisconsin farms that were growing sod on 5,581 acres.

Source: USDA NASS, Quick Stats.

Try it!

Complete the following steps to create a community in the grid. The bold lines are roads.

1. Draw and label a community with each of these features. Each of the features can be in multiple or a fraction of a grid square.
 - a school
 - 5 houses
 - a park
 - a cemetery
 - a store
 - a hospital
 - a farm
2. Color in green all the areas where turf would be.
3. What fraction of your community is turf?



Forestry and Logging

In this chapter, I will...

- investigate the impact of forestry and logging in Wisconsin, identifying counties where it is a major industry.
- learn the definition of a cord of wood.

Wisconsin's forests are another important crop to the state. Wisconsin trees provide people with toothpicks, toilet paper, apples, walnuts, medicine, biomass for energy, and much more! In fact, Wisconsin is the number one producer of paper in the U.S.!

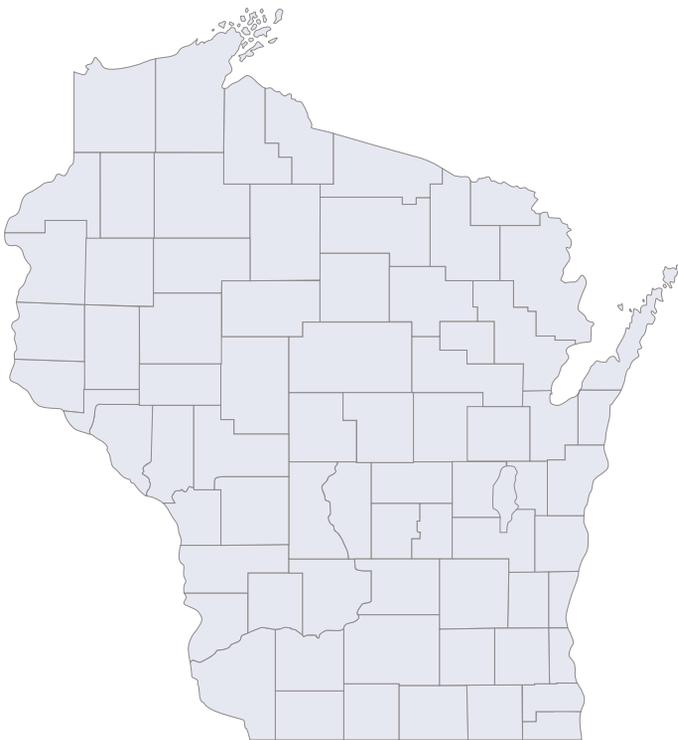
Fun Fact

Wisconsin has nearly 17 million acres of timberland.

Try it!

Complete the following.

Over 59,000 people work in jobs related to the forestry industry in Wisconsin. It is the number one employer in Forest, Iron, Lincoln, Price, Taylor, and Trempealeau counties. **Color these counties on the map.**



What do you learn from the map about the forestry industry?

Wood is measured and sold using units called cords. A cord of wood is 4 feet by 4 feet by 8 feet. **Draw a cord of wood. Label it with the correct measurements.**



Use logic and reasoning skills to complete the following using one of the below values:

942 889,870 7.5 million 12

A cord of wood can be made into:

_____ toothpicks

_____ sheets of 8.5"x11" paper

_____ dining room tables that seat 8

_____ one pound books



Christmas Trees

In this chapter, I will...

- learn about Christmas trees and how they are grown.
- compare and contrast deciduous, evergreen, and conifer trees.

Christmas trees are an important crop for many Wisconsin farmers. There were 868 Christmas tree farms in Wisconsin with over 23,651 acres of trees in 2012. That year, about 611,387 trees were harvested, making Wisconsin fifth in the nation for trees harvested.

Growing Christmas trees takes years of care. When spring comes, growers prepare fields for planting. Each year, growing trees are fertilized and protected from weeds and insects. The trees' new branches grow in different lengths, so they are trimmed back to a beautiful shape. This is called **shearing**. Trees that are ready to be harvested are cut in the fall for customers.

Source: USDA NASS, *Wisconsin Farm Reporter*. June 2014.

Try it!

Trees can be classified as either an **evergreen** or a **deciduous**. Christmas trees are a special type of evergreen called a **conifer**.

Write each of the following facts in the correct category: **deciduous**, **evergreen**, or **conifer**. Research any facts you do not know.

Facts

from the Latin word *decidere* (to fall)

has green leaves all year

oak and maple are examples

bear seed structures called cones

loses all of its leaves at some point during the year

eucalyptus is an example

large, broad flat leaves

Christmas tree is an example of one

from the Latin words *consus* (cone) and *fer* (to bear)

Deciduous	Evergreen
	Conifer



Maple Syrup

In this chapter, I will...

- discover how maple syrup is harvested.
- write two raps or poems about maple syrup.

Maple syrup is made from **sap**. The sap is the liquid inside of plants which carries food to the leaves and branches.

In the spring, sap travels or runs from the roots up into the tree trunk and branches. At this time, farmers **tap** the maple trees. The tap is a small **spigot** or faucet which is pounded into the trunk. The sap then runs out of the tap

and is collected in a pail, bag, or hose. Farmers then cook the sap, boiling away the water, to make maple syrup. It takes about 40 gallons of sap to make one gallon of maple syrup. Wisconsin ranks fourth in the U.S. in maple syrup production.

Try it!

Write two raps or poems (or one of each) about maple syrup.

Title: _____

Title: _____

If you need help getting started, use a computer to research maple syrup. Use the images and text for inspiration. Remember you can write about maple syrup production, taste, smell, feel, uses, etc.



In this chapter, I will...

- identify the different grains grown in Wisconsin.

Wisconsin produces many types of **grains**. Grains are any of the cereal crops and include corn, soybeans, wheat, oats and barley. Wisconsin is also a top producer of hay.

Fun Fact From 1840-1880, Wisconsin produced one sixth of the nation's wheat.

Try it!

Improve your "Grain IQ" by using the vocabulary in the word bank to complete the sentences. The letters in the boxes will reveal Wisconsin's #1 industry.

Word Bank				
alfalfa	bread	cereal	cookies	crops
ethanol	forage	malt	nutrient	poultry

- Wheat flour is used to make.....
- Another name for hay used as animal feed is
- You can eat oats for breakfast as.....
- Corn plants chopped and made into silage for animal feed is stored in a.....
- Wisconsin's winter wheat makes the best flour for.....
- Soybeans provide animals and humans with protein which is an important.....
- Wisconsin's most important hay crop is.....
- Barley is used to make.....
- Corn is the most important feed grain for livestock and.....
- Biodiesel is an environmentally friendly fuel that is made from like soybeans.
- The alcohol fuel made from corn is called.....

Wisconsin's #1 industry is _____.



soybeans



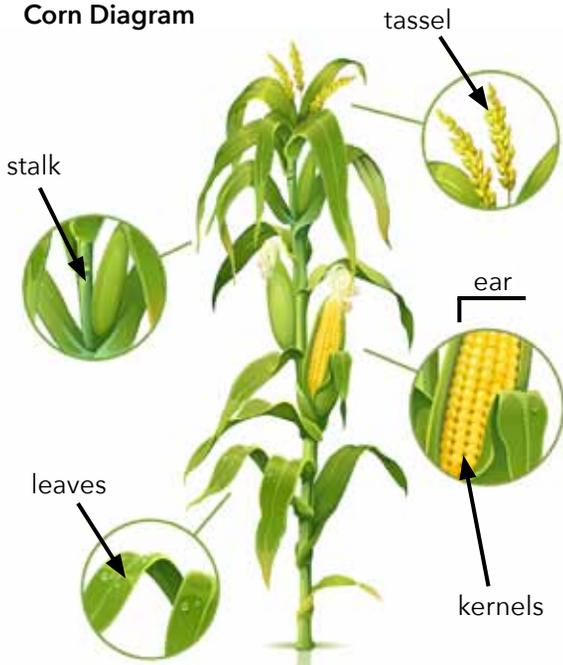
wheat

Corn

In this chapter, I will...

- learn the impact of corn production in Wisconsin and how ethanol is created.
- compare and contrast sweet and field corn.

Corn Diagram



Corn is the largest crop grown in Wisconsin. In 2014, about 4 million acres were planted. Not all corn grown in Wisconsin has the same purpose or harvested the same way. Just the ear of corn is harvested when corn is used for grain. The stalk is not used. The stalk and the ear is used when corn is chopped into animal feed called corn silage. Wisconsin ranked tenth in 2014 for corn harvested for grain and first for corn chopped for silage.

Source: USDA NASS, Quick Stats.

Ethanol

Ethanol is fuel that is a blend of gasoline and alcohol made from grains like corn and wheat. In the U.S., 90% of the ethanol produced is made from corn. Researchers report that ethanol burns cleaner than gasoline.

To make ethanol, corn kernels are ground. The particles are mixed with water, yeast, and enzymes. The mixture is heated several times, creating a vapor. The vapor is cooled into a liquid. The water is removed from it, leaving ethanol that can be added to gasoline.

How Wisconsin Corn was Used in 2015



Source: Wisconsin Corn Growers Association. 2015

Try it!

The corn you eat fresh, frozen, or from a can is usually sweet corn. Field corn is what animals often eat, and the corn you most often see in Wisconsin fields. Sweet corn and field corn are both grown in Wisconsin.

For each pair, decide which description is describing sweet corn (S) and which is field corn (F)

___ often fed to animals, but can be used to make corn flour, ethanol, and plastic

vs. ___ people regularly eat it off the cob

___ shorter plant with thinner leaves

vs. ___ taller plant with broader leaves

___ harvested when kernels are round and sweet

vs. ___ harvested when kernels are dry and hard



In this chapter, I will...

- discover uses of soybeans.
- create a diagram of the life cycle of a soybean plant.

Wisconsin grew nearly 92.6 million bushels of soybeans in 2015. The plant is a good source of protein, and can be used as food for people and animals. It is also used to make household items such as some candles, crayons, paints, and plastics.

Soybeans are also used to make biodiesel. This fuel can be used in trucks and tractors. Some people say the exhaust from this environmentally friendly fuel smells like french fries!

Source: USDA NASS, *Quick Stats*.

Try it!

Soybeans are a plant that have a life cycle similar to many other plants. Draw a picture in each box using the description provided to show soybean's life cycle.

In Wisconsin, farmers often plant soybeans in May. The farmer uses a planter pulled by a tractor to sow the seed into the ground.

After 1 to 2 days, the seed begins to germinate and grow under the ground. A small white root sprouts from the seed.

In about a week, a green seedling grows from the seed to above the ground.

The seeds ripen, the leaves fall off, and the plant turns brown and dies. The plant's life cycle is complete. Farmers harvest the soybeans in October.

Flowers turn into pods, which soon fill with two to three seeds. The pods hang from the plant like earrings.

The plant continues to grow taller and the roots grow deeper. Many leaves and flowers grow on the plant.

Genetic Improvements

In this chapter, I will...

- learn about genetic improvements to crops.
- write definitions using clues from a word's root, prefix, and suffix.

Today most of the corn and soybeans grown in the U.S. have been genetically modified. This means that their genes have been changed using biotechnology. Many other crops have been genetically modified too.

Try it!

A word's root, prefix, and suffix can help you understand what the word means. Write a definition for each word.

Genetic	
Root: gen-	Meaning: birth, produce, life
Suffix: -tic	Meaning: pertaining to
Definition:	

Modify	
Root: mod-	Meaning: measure or change
Suffix: -ify	Meaning: to make
Definition:	

Biotechnology	
Prefix: bio-	Meaning: life
Root: techn-	Meaning: art, skill
Suffix: -ology	Meaning: study of
Definition:	

Career Spotlight

Job Title:

Plant Breeder

Duties:

Develop plant and seed breeding programs

Do laboratory research with plants and their genes

Work to improve seed characteristics like size and quality

Salary Range:

\$42,340 - \$79,820

Skills Needed:

Biology, Chemistry, Physics, Math, Business, Computer Science, Laboratory Research, and Communication

Education Required:

at least a Bachelor's Degree (4-5 year degree from a university), and often a PhD or Masters of Science (3-7 years of study after a Bachelor's at a university)



Source: Department of Commerce and Economic Opportunity. 2016.



In this chapter, I will...

- discover Wisconsin has the most dairy goats in the U.S.
- create an advertisement for dairy goats.



Worldwide, people drink goat milk more than any other milk.

Wisconsin farmers raise many kinds of animals. These farm animals are called livestock. Farmers provide their livestock with proper food, safe housing and **veterinary** care. These farm animals give us food, clothing, and many other products.

Goats can be raised as meat goats or dairy goats. Dairy goats provide us with milk that can be used for products such as cheese and milk to drink. Goat milk is similar to cow milk, but it has slightly less lactose. Some who have allergies to cow milk can drink goat milk. In 2016, Wisconsin had 44,000 dairy goats, the most in the U.S.

Source: National Ag in the Classroom. July 11, 2016.

Try it!

Create an advertisement below for dairy goats. Be sure to include a slogan at least one dairy goat fact. Also tell where your advertisement might appear and why.

Tell where this advertisement will appear (billboard, magazine, social media, etc.) and why.



Wisconsin Dairy

In this chapter, I will...

- discover the importance of dairy to Wisconsin's economy.
- complete a close read of an interview with a dairy farmer in order to learn about dairy farming.
- describe how milk gets from farm to store, school, and restaurant.

Wisconsin is called "America's Dairyland." Dairy is Wisconsin's top commodity, or product produced and sold. In 2015, there were over 9,900 dairy farms, which is more than any other state, and 1.28 million dairy cows in Wisconsin. The dairy industry contributes \$43.4 billion to the state's economy. That is about \$82,500 per minute!

Source: State of Wisconsin Department of Agriculture, Trade and Consumer Protection. Wisconsin Agricultural Statistics. 2015.

Interview with a Dairy Farmer

Name:

Andrea Brossard

Farm Name:

Brossard Dairy Farm, LLC

Farm Location:

Beaver Dam, WI

Farm Facts:

70-80 steers,
260 Holstein cows,
650 acres of crops (corn, alfalfa, wheat, and soybeans)



cropped. However, these challenges make you a better and stronger person and farmer. These challenges drive your passion and ability to push to be the best you can be.

3. What is your favorite part of your job?

There are so many parts of being a dairy farmer that I love. First and foremost, I love working with and caring for animals. It is a true love and passion that I have. From a young child to today, this has been my true draw to the dairy industry.

4. Why are you a dairy farmer?

Dairy farming is always evolving, especially with emerging technologies. The future and all it holds is exciting! I am a dairy farmer because my passion and drive to care for animals and provide food, fiber and fuel for America is so deep and strongly imbedded in my roots. The pride and joy that comes from a being a multi-generation farm brings me true excitement for not only my future, but for the future of the dairy industry.

1. Describe your typical day.

Dairy farming is a 365-day a year job. We don't take sick days or vacations, and many jobs on the farm have to be done every day, like feeding calves and milking cows. However, every day is very different! For example, while feeding calves a cow might be calving and I need to tend to her and her new calf.

2. What challenges do you face in your job?

There are many challenges I face as a dairy farmer including unpredictable weather and ever-changing markets for milk, meat and

Fun Fact

Wisconsin has been the top cheese producing state in the U.S. since 1910. In 2015, more than 3 billion pounds of cheese were made.



Try it!

Follow the below steps and answer the questions to complete a close read with the text on page 32.

1. Write a one sentence prediction on what the text is about. What evidence do you have to support your prediction?
2. **Read the text.** Underline important information to annotate the text as you read.
3. What is this text mostly about? Write a two sentence summary using evidence from the text.
4. **Read the text** again.
5. Circle 2-3 important words in each interview response.
6. Choose one word you do not know from the text. Write its definition.
7. **Read the text** again.
8. What was the purpose of this text? What did the author want you to learn?
9. What additional questions do you have after reading this text? Write at least two questions.



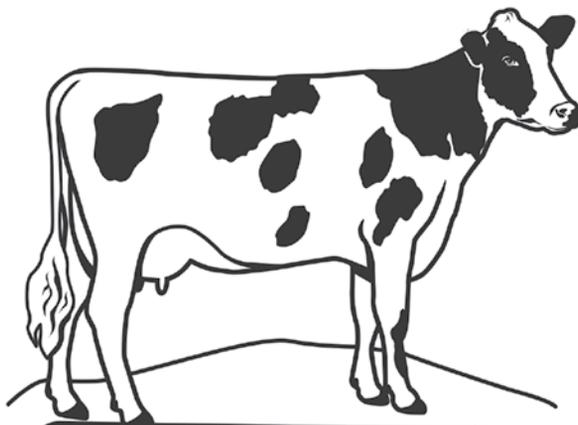
Wisconsin Dairy

In 2015, 29 billion pounds of milk was produced by Wisconsin cows. This milk was made into dairy products such as cheese, yogurt, and ice cream. **Pasteurized** milk is put in to containers and sold in stores for drinking.

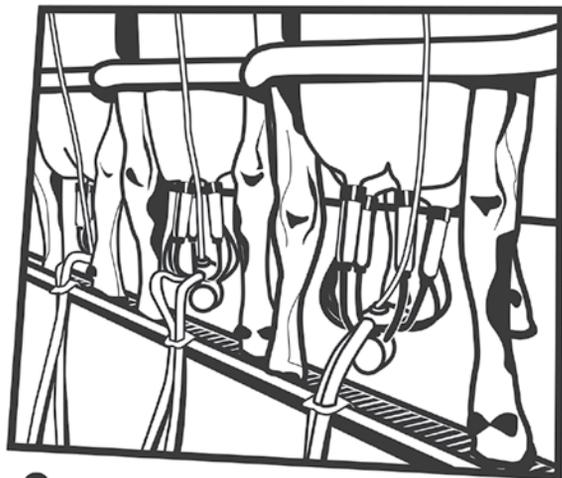
Source: State of Wisconsin Department of Agriculture, Trade and Consumer Protection. Wisconsin Agricultural Statistics. 2015.



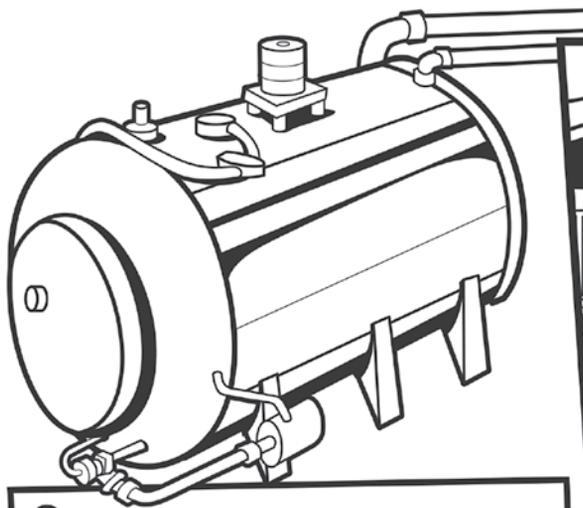
Milk from Cow to You!



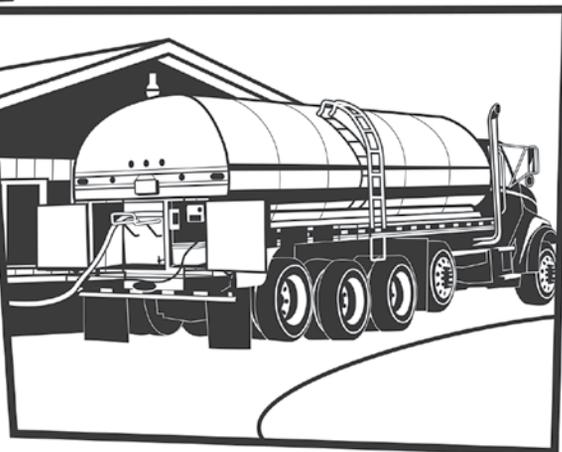
1. Milk comes from healthy, well-fed cows that are raised on dairy farms.



2. To begin milking, a cow's udder is washed before the milking machine is attached. This happens at least two times a day.



3. Fresh milk from the cow is pumped through a pipe and into an insulated tank, where it is cooled and kept fresh and safe.

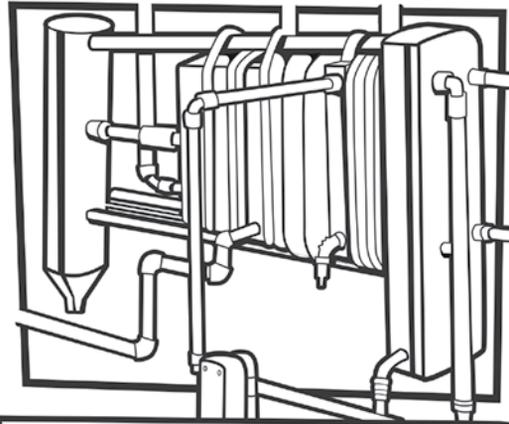


4. Each day, a special insulated tanker truck comes to the farm to pick up the cold milk and deliver it to the dairy plant.

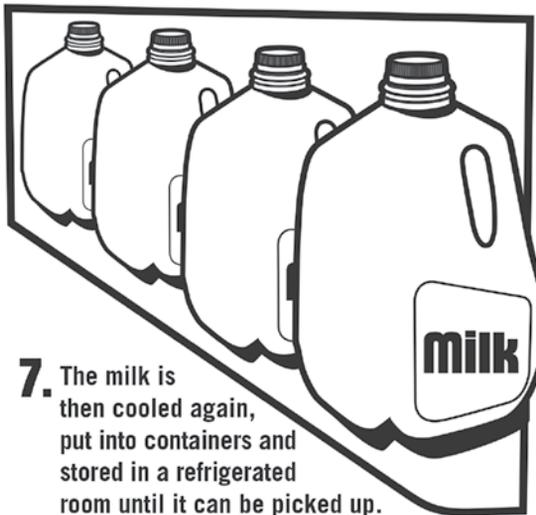




5. At the dairy plant, the milk is kept cold and tested many times for quality.



6. Next, the milk is quickly heated, or pasteurized. This is an important step to ensure the milk is safe and wholesome.



7. The milk is then cooled again, put into containers and stored in a refrigerated room until it can be picked up.



8. Within two days after milking, the milk is loaded onto refrigerated trucks and delivered to schools, restaurants and supermarkets.

Try it!

Put the sentences below in order, numbering them 1 to 6, to trace the story of dairy products from farm to store.

- ___ The farmer washes the cow's **udder**, and the cow is milked.
- ___ The milk is tested for quality and pasteurized.
- ___ The dairy cow eats a balanced diet and produces milk.
- ___ The milk is picked up at the farm and taken to the dairy plant.
- ___ The milk goes into a tank at the farm where it is kept cool.
- ___ The dairy products are packaged and delivered to supermarkets, schools, and restaurants.



Veal Calves

In this chapter, I will...

- create a graph comparing the amount of protein in veal and other meats.

Meat	Protein in a 3 oz serving (grams)
Beef, cooked	22
Lamb, cooked	26
Pork, cooked	23
Veal, cooked	31
Chicken, roasted	27
Turkey, roasted	25

Source: USDA, Home & Garden Bulletin 72. 2002.

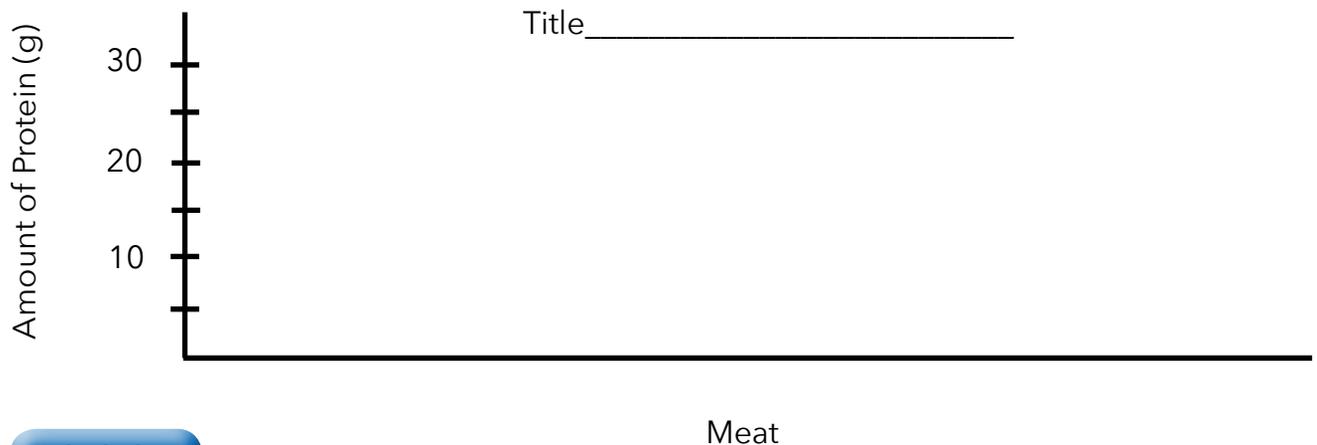
Veal calves are raised on farms in many states in the U.S. including Indiana, New York, Ohio, Pennsylvania, and Wisconsin. Today, families operate many of the veal farms. The families want to produce the best food for our country.

Veal farmers buy calves from dairy farmers who do not need their male calves since they do not produce milk. Many veal calves are Holstein cattle that are black and white. They weigh about 100 pounds when they are born and grow to about 475-500 pounds.

Calves raised for veal provide nutritious food that tastes good and is packed with vitamins, minerals, and protein. Veal calves also provide other products. Clothing such as shoes, jackets, and belts that are made of leather come from cattle. Other parts of the animal are used to make medical supplies and household items such as bandages, medicines, paint, crayons, candles, instrument strings, and wallpaper.

Try it!

Use the information in the table above to create a bar graph showing the amount of protein in a serving of each of the meats listed below.



Analysis

What do you learn from your graph? _____



In this chapter, I will...

- explore the difference between beef and dairy cattle.
- take notes about beef's nutritional value.

Wisconsin is home to more than 270,000 beef cows. Beef cattle are different from dairy cattle. They tend to be shorter and more muscular when compared to dairy breeds. Dairy cows are more efficient at turning food into milk, while beef cows efficiently turn food into muscle. The meat that people eat is muscle.

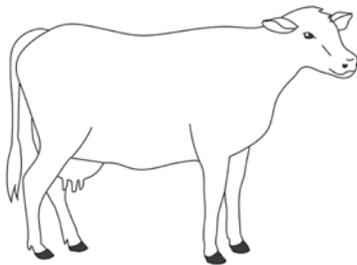
Source: Wisconsin Department of Trade and Consumer Protection. Agriculture Stats. 2015.

Try it!

There are many different cattle breeds, just like there are different breeds of cats and dogs. Draw an image of the cow breed described. When complete, research the cattle breeds to see if your drawing is correct!

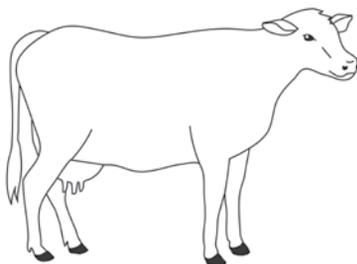
Beef Cattle

Black Angus (ā-n-gus)
Black all over



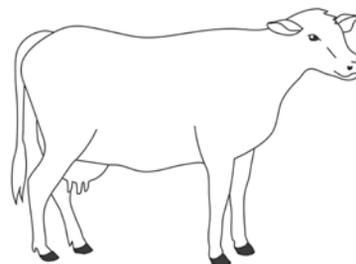
Hereford

(her-fōrd)
Red with a white face and belly, along with white on the lower part of its legs and along the top of the neck in line with the spine



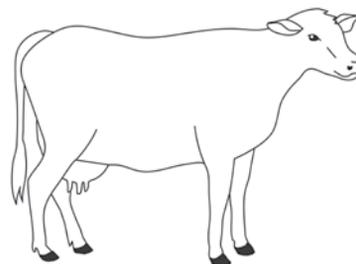
Dairy Cattle

Black Holstein (hōle-stein)
Black and white patches all over



Jersey

(jer-zēē)
Golden Brown all over with some white near the nose



Beef Cattle

Ground beef, steaks, and roasts are all food provided to people by beef. Beef is important in people's diets because it provides zinc, iron, B-vitamins and protein. These nutrients are necessary to keep people healthy.

Our body needs zinc for healing, to build muscle, and it helps you think. Iron helps red blood cells carry oxygen away from other body cells. Iron from beef is more easily absorbed than iron from vegetable sources. Beef provides twice as much iron as other meats and is the number one source of zinc in our diets.

Beef is also one of the best sources of B-vitamins in the diet. B-vitamins help our bodies to use the energy we consume. B-vitamins are also important for a healthy nervous system and normal cell function. Protein is a source of energy for your body. Protein builds and repairs your body's muscles, bones, blood and organs. The protein in beef is a "complete protein" which means it has all the essential **amino acids** the body needs to build and repair tissue.

Try it!

Taking notes can help you find and remember important information in a text. It can also help you summarize a text.

Complete the notes and write a 2-3 sentence summary of the text above.

Part 1: Text Notes

I. B _ _ _

- important in people's _ _ _ _ _
- Good source of nutrients such as:
 - _ _ _ _ _
 - helps with healing, building muscle, and thinking
 - iron
 - helps _ _ _ _ _ carry _ _ _ _ _ away from other cells
 - B-vitamins
 - helps people use _ _ _ _ _
 - _ _ _ _ _
 - builds and _ _ _ _ _ the body's _ _ _ _ _ , _ _ _ _ _ , _ _ _ _ _ , and organs

Part 2: Summary



In this chapter, I will...

- describe how farmer care for pigs.
- name food and by-products people get from pigs.



Pork chops, ham, bacon and sausage all come from pigs. Pork provides us with many nutrients. It has high amounts of protein, B-vitamins, and thiamin.

Farmers who raise pigs are called pork producers. Their job is to make sure the pigs they raise are healthy and well fed. A pig eats a balanced diet of soybeans, corn, vitamins, and minerals. The pork producer checks his animals throughout the day to be sure they are healthy and have plenty of feed and water.

They keep their pigs in buildings to protect them from severe weather. That way, the animals are in a cool, comfortable environment all of their lives. Wisconsin farmers raised 320,000 hogs in 2015.

Pigs are very much like us. Their heart and other organs work the same way ours do. That's why doctors can use a pig's heart valve in a human when a human's wears out. Pigskin can also be used to treat people who have been badly burned. Other pig **by-products** are used to make items that you probably use daily, including buttons, crayons, chalk, and glue.

Fun Fact

Today's pork is lean, which means low in fat. A pork tenderloin is as lean as a skinless chicken breast.

Source: USDA NASS, *Quick Stats*.

Try it!

Use the above information to write 1-2 facts in each category.

Food people get from pigs	Ways pigs help people who are ill	Products from pigs
Nutrients people get from eating pork.	Food in a pig's diet	How farmers care for pigs



Sheep

In this chapter, I will...

- identify by-products people receive from sheep.
- use words and phrases originating from the wool industry to complete sentences.

Sheep were one of the first **domesticated** animals. They provided their herder with his basic needs of food, clothing, and shelter. Columbus brought the first sheep to America. In fact, the sale of wool helped pay his way.

Sheep in Wisconsin are raised in flocks of just a few to 3,000 animals. The female sheep is called a ewe and each year she has one to three lambs. The male sheep is called a ram. Once each year before summer, the farmer **shears** his sheep. Shearing is like giving the sheep a haircut. The wool comes off in one piece which is called the fleece. The wool is then washed, dyed, and spun into yarn to make clothing, rugs, and blankets.

Sheep are also raised to provide meat and milk. The meat from a grown sheep is called **mutton** and that from a young sheep is called lamb. The milk from sheep is used to make special cheeses. Most of the sheep in Wisconsin are raised for meat.

Try it!

The wool industry has added phrases and vocabulary to the English language. Complete each sentence with the correct word or phrase.

Words and Phrases from the Wool Industry

lamb	meek	sheep
sheepish	sheepskin	weaver
wild and woolly	pull the wool over their eyes	



1. When a person has a timid or guilty look we say they look _____.
2. March comes in like a lion and goes out like a _____.
3. To fool someone is to _____.
4. We sometimes refer to the Old West as _____.
5. Years ago, a college diploma was sometimes called a _____.
6. If your last name is _____, one of your ancestors probably operated a loom.
7. Sometimes we say people are "_____ as a lamb."
8. To go to sleep, some people count _____.



In this chapter, I will...

- learn about different uses for horses and the definition of foal, stallion, and mare.
- calculate horsepower.

Before tractors and trucks, Wisconsin farmers depended on the horse to provide power for plowing, harvesting, and hauling. Today horses are still found on farms, but they are mainly used for recreation.

Horses come in many sizes, shapes, and colors. Draft horses are the largest. They can be six feet tall at their shoulders and weigh more than 2,000 pounds. Draft horses can pull heavy loads and are often seen pulling fancy wagons. Clydesdales, Percherons, and Belgians are two breeds of draft horses.

The average horse stands about five feet tall at the shoulders. People ride or drive these horses for enjoyment. These horses may participate in sporting events, like racing, or may be kept for breeding. Some horses in Wisconsin work, assisting their owners. For example, police officers sometimes use horses.

Baby horses are called **foals**. A male horse that can father foals is called a **stallion** and an adult female horse is called a **mare**. Horses are full grown by age five and often live to be 30 to 40 years old.

Fun Fact

In 2012, there were 103,481 horses in Wisconsin.

Source: USDA NASS, *Quick Stats*.

Try it!

Horsepower (hp) is a unit used for measuring power, like the power of an engine. This unit evolved from comparing how many draft horses it took to do the same amount of work as a steam-engine.

Follow the below steps to calculate how much hp you have.

1. Record your weight in pounds.

weight: _____ lbs

2. Find a stairway that has more than six steps.

3. Measure the height of one stair in feet.

Multiply this number by the number of stairs in the stairway.

stairway height: _____ feet

4. Time how long it takes for you to run up the stairway. You can get a running start. Stop the time when both your feet land at the top of the stairway.

time: _____ seconds

5. Multiply your weight x stairway height x 9.81.

product: _____

6. Divide your product from step five by your time from step four.

quotient: _____ watts

7. Divide your quotient from step six by 746. Your solution is your horsepower.

_____ hp



Poultry

Poultry are domesticated birds raised on farms. They provide us eggs, meat, and other by-products. Chickens, ducks, and turkeys are the most popular poultry raised in Wisconsin.

In this chapter, I will...

- learn the definition of poultry, and provide examples of poultry
- create a jingle and a print advertisement for a poultry farm.

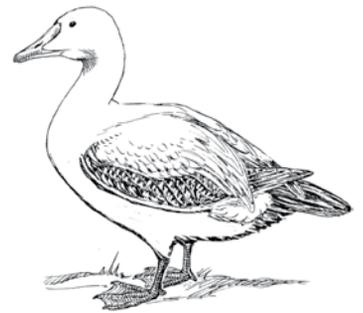


In the past, chickens roamed free on farms, eating scraps and insects. They laid about three eggs per week. The chickens were susceptible to **predators**. Today, most chickens are raised indoors. Farmers provide them with fresh water, a well-balanced diet, and protection from predators. Chickens today lay about five eggs per week.

A rooster is a male chicken, a hen is a female, and a chick is their young. Wisconsin chicken farms produce over one billion eggs each year.

Wisconsin was home to about 45,000 ducks in 2012. Males are called drakes, females are ducks, and their young are chicks. Ducks are raised to provide us with meat, **down**, and feathers.

While chickens and turkeys have both white and dark meat, ducks have only dark meat. Down is the small, soft feathers found on water birds like ducks. It is an excellent insulator which protects waterbirds from the cold and wet. Down is used in comforters and winter clothing. Duck feathers are ground and used in animal feeds and fertilizers. Some feathers are still used in pillows.



Turkeys are **native** to North America. The Pilgrims hunted wild turkeys. Ben Franklin felt the turkey was a very noble bird. He wanted it to be the United State's national emblem, not the bald eagle.

In 2012, about 3.5 million turkeys were raised in Wisconsin. Male turkeys are called toms and females are hens. Baby turkeys are called chicks.

Turkey is served all year round. It is low in fat and cholesterol. Turkey, as well as other meat, is important in people's diet because it is high in protein.



Source: USDA NASS, *Quick Stats*.



Try it!

Pretend you are a poultry farmer. Create a jingle and a print advertisement for your farm.

Identify the type of poultry on your farm. Circle one, two, or three of the following:

Chicken

Duck

Turkey

Write the purpose of your jingle (e.g., so people buy meat from your farm, to get people to visit your farm, etc.).

Write your jingle.

Write the purpose of your print advertisement.

Draw and color your advertisement.



Furs

Early French explorers discovered Wisconsin had many animals that could be trapped for their fur. First, the French traded with the American Indians for the furs they wanted. Later, the French began trapping animals for themselves. The furs were used to make hats and clothes.

Trapping fur bearing animals didn't always provide good furs. Animals in the wild had to hunt for food, fight with other animals, and search for shelter. If animals didn't find the proper food and shelter, they were not healthy and neither were their furs. Also, there was a concern that trapping would **endanger** the number of fur bearing animals in the wild.

To solve these problems, farmers began raising mink and fox on farms. There, the animals receive the proper food and shelter and are protected from predators. This guarantees that there will be plenty of high-quality furs and that the wild animal population will not be endangered.

Wisconsin produces more mink than any other state. Wisconsin is a good place to raise fur animals because our dairy, poultry, and livestock farms provide the meat and milk products the mink and fox are fed.



Mink are nocturnal. They are also great climbers and swimmers, diving to a depth of 16 feet!

Pdreijnders (Own work) Wikimedia Commons. 2014.

In this chapter, I will...

- describe why farmers began raising fur bearing animals on farms.

Try it!

Complete the following.

1. What did the French discover in Wisconsin?
2. Define endanger.
3. How do Wisconsin fur farmers care for their animals?
4. Why is Wisconsin a good place to raise mink and fox?
5. Write a question you have about mink farming.

Bonus: Research the answer to your question!



Some Wisconsin farmers raise fish. This type of farming is called **aquaculture**. Wisconsin farmers raise trout, bass, northern pike, muskies, and bait fish.

There were 207 aquaculture farms in Wisconsin in 2012. More trout are raised in Wisconsin than any other fish. The state ranks eighth in the nation for trout production. In 2012, trout sales totalled \$2,067,000.

Source: USDA NASS, *Quick Stats*.

In this chapter, I will...

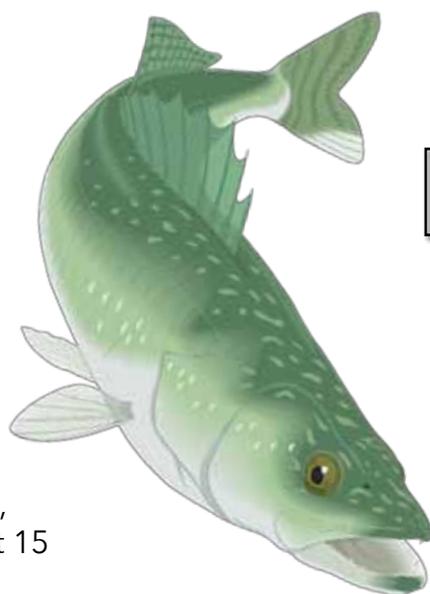
- learn the definition of aquaculture.
- use logic to organize descriptions telling a fish's life cycle in a hatchery.

Try it!

Number the descriptions 1 to 5, putting them in the correct order to learn how fish are raised on in aquaculture.

Once fish grow to 6-inches long, they are called **stockers**. They are sometimes released into lakes and streams. Fish being raised for human food are kept on the farm until they reach 11 to 12 inches in length. They are then sold to restaurants, stores, and processors.

Farmers place fish eggs in an **incubator** where running fresh water provides oxygen. The incubators are kept in a **hatchery**.



Once the yolk sac disappears, the young fish float to the top of the water. The farmer begins feeding them fish meal every hour during the day.

The young fish, called sac fry, hatch from the eggs in about 15 days.

When the fish grow to be 3-inches long, they are called **fingerlings**. The farmer moves the fingerlings from the hatchery into ponds or cement tanks called raceways. Here the fish are fed four times per day.



Bees

In this chapter, I will...

- discover that a queen, drones, and worker bees live in a bee colony.
- complete math problems to learn facts about honey production in Wisconsin.

Wisconsin beekeepers cared for 59,000 colonies of honeybees in 2013. Each colony has one queen bee, who can live up to eight years. She is the mother to all of the bees in the colony.

Males that live in the colony are called drones, and their job is to mate with the queen. Worker bees are infertile females, and they complete most jobs in the

hive, including protecting the hive and feeding the queen and drones. Up to 80,000 bees can live in a colony.

During the summer, honeybees travel about 55,000 miles back and forth to the hive to gather enough **nectar** for one pound of honey. Bees are very important because during their travels they pollinate plants, including farmer's crops. Some crops need to be pollinated before they can produce fruit, seeds, or grain.

Source: USDA. 2014 Wisconsin Agricultural Statistics.

Try it!

Use the information above to solve the problems.
Show your work on another piece of paper.



1. In 2013, Wisconsin bees produced on average 60 pounds of honey per colony. How many total pounds of honey were produced in Wisconsin that year?

Answer: _____

2. The average price of honey in Wisconsin in 2013 was \$2.31 per pound. On average, how much money is made from the sale of honey produced by one colony. *Hint: Use the average pounds produced per colony.*

Answer: _____

3. Wisconsin produced 2.4% of the nation's total honey in 2013. How much honey was produced in the U.S.?

Answer: _____

Fun Fact

Wisconsin ranks tenth in the nation for honey production.



Exotic Farm Animals

In this chapter, I will...

- identify exotic farm animals are raised in Wisconsin and their native continents.

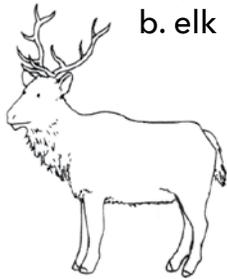
Try it!

Match the descriptions of the exotic animals below to the correct picture. Then research to find each animal's native continent.

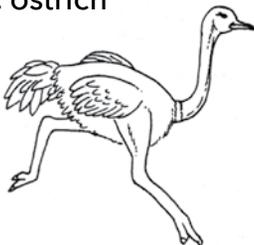
a. emu



b. elk



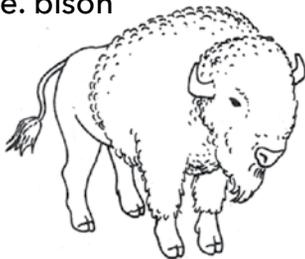
c. ostrich



d. llama



e. bison



1. _____ This is the largest land mammal in North America. Once used for food, tools, clothing, and other products, today's animals provide us with rich, red meat.

Native Continent: _____

2. _____ This strong, willing and calm animal is used for packing, fiber production, and guarding livestock.

Native Continent: _____

3. _____ This bird is a cousin to the ostrich. It is raised for its red meat and for oil, which is used for medicinal purposes.

Native Continent: _____

4. _____ This is the world's largest bird. Originally raised for their feathers, these birds now provide leather and a low-fat red meat.

Native Continent: _____

5. _____ This large member of the deer family is raised for breeding stock and their antlers.

Native Continent: _____



Animal ID and Tracking

Have you ever noticed some livestock have a tag in their ear that looks like an earring? This tag helps a farmer better identify (ID) an animal. The farmer can better manage animal nutrition and health. Other forms of animal identification (ID) are brands and tattoos.

Animal ID is part of the Wisconsin Premise Registration Act. This act also requires people who have livestock of any type in Wisconsin to register premises, or locations where animals go or are kept. This makes it possible for people to trace the location of livestock, both in Wisconsin and when they go out of state. Premise information also allows animal health officials to more quickly respond to an animal disease and contact the livestock owners with valuable information to keep them safe.

Premise registration and animal ID help ensure the safety of the food people eat, while helping livestock owners better maintain and protect their animal's health.



This sheep has an ear tag that helps the farmer identify it.

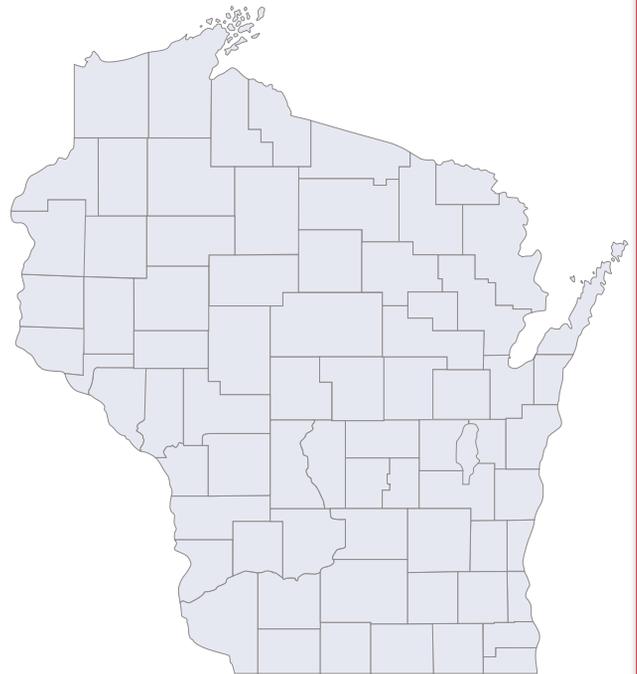
In this chapter, I will...

- learn why farmers tag animals and premises must be registered.

Try it!

Place a dot at each location the horse has lived. Then connect the dots to trace the animal's moves.

1. Born in Manitowoc.
2. Move to Milwaukee.
3. Move to La Crosse.
4. Move to Green Bay.



Sheep Image: John Haslam from Dornoch, Scotland, via Wikimedia Commons.



In this chapter, I will...

- learn the definition of rendering.
- identify items made from animal by-products.

bones. These by-products are collected daily from slaughterhouses, butcher shops, and grocery stores, and brought to rendering plants for processing.

Rendering started a far back as the Middle Ages when butcher's fat trimmings were used to make soaps and candles. This makes rendering one of the earliest forms of recycling!

From French Fries to Biodiesel

Rendering companies also collect used cooking oil and greases. The used cooking oil comes from deep fryers from all different types of restaurants like fast food chains to fine-dining restaurants.



To process the used cooking oil, it is first boiled so that all water is removed. It is then screened to take out food and other unwanted particles. What remains is called yellow grease, which is used as biodiesel, animal feed, and industrial lubricants. Biodiesel is a renewable fuel that can operate diesel vehicles like cars, trucks, buses and tractors.

So the oil that was used to cook your french fries could be turned into fuel for a vehicle!



Try it!

Circle the new products that are made from the rendering process.



Wisconsin Agriculture Review

Try it!

Create your own recipe! Write the ingredients and their amounts, as well as the recipe directions. Put a star after the ingredients produced in Wisconsin.

Recipe Name: _____

Ingredients

Directions

Try it!

Career Spotlight: Research a career in agriculture that interests you. Record your findings below.

Job Title:

Skills Needed:

Duties:

Salary Range:

Education Required:



Glossary

acre ('a-ker) a measure of land; 4,840 square yards

agribusiness ('agrə-biz-nes) a business or farm involved in research, service, supply, and production, as well as processing, marketing, and distribution of agricultural products

amino acid (ə-'mē-nō as-əd) building blocks of proteins

aquaculture (ak'wə-kul'-char) the raising of fish

aquatic (e-'kwät-ik) growing or living in water

aquifer (ak'wə fûr) the earth's underground storage for water

bed ('bed) a place where plants are planted

biotechnology (bī-ō-tek-'nāl-e-jē) the study of living plants, animals, and humans and the use of this knowledge to improve life

bog ('bog) wet spongy ground

bushel (bush'-əl) a measure for fruit, grain, vegetables, and other dry products equal to 4 pecks or 32 quarts

by-product (bī'-prəd-əkt) something produced as a secondary result of the manufacture or production of something else

conifer ('kän-ə-fər) an evergreen tree that produces cones

conserve (kən-serv') protect from loss or from being used up

cooperative (kō-op'rə-tiv) a member-owned business providing goods or services

crop rotation (ro'-tat) to change the crop grown in a field after a period of time

deciduous (di-'sij-ə-wəs) trees that shed their leaves every year

domesticate (de-mes'-tə-kat) to change from wild to tame

down ('daun) the small soft insulating feathers from water birds

drone ('dron) an aircraft without a pilot that is driven using a remote control or autopilot

endanger (in-'dan-jər) to be used up or threatened by extinction

evergreen (ev-ər-,grēn) a tree or bush that has green leaves all year long

erosion (i rō'zhən) the act of land wearing away, slowly or gradually

ethanol (eth' ə nol) an alcohol which can be used as a fuel



export (eks-port') send out of one country for sale and use in another

fertilizer (fûr'təl-i'zər) a material used to add nutrients to the soil

fiber (fī-bər) materials used to make clothing like cotton or wool

fingerling (fin-gər-l'ing) a small young fish

foal (fol) a young horse

gallon (gal-uhn) a liquid unit of measure equal to four quarts

gene (jen) a complex molecule which passes on characteristics from parent to offspring

global positioning system ('glō-bəl puh-zish-uhn-ing siss-tuhm) a navigation system that uses satellite signals

grain (gran) a single seed or seedlike fruit of wheat, corn, oats, and similar cereal grasses

harvest (har-vist) the gathering of crop

hatchery (hach'ər'ē) a place for hatching eggs

hybrid (hī-brid) the offspring of two different varieties of plant or animal

import (im-port) to bring into a country for sale and use

incubator (in'-kyə-bā'-ter) a machine which keeps temperatures constant for the hatching of eggs

input (in'-put') an item or service which contributes to producing a product

mare (mār) a female horse

mutton ('mæt-n) the meat from mature sheep used for food

native ('nāt-iv) grown, produced, or originating in a particular place

nectar (nek'tər) a sweet liquid found in many flowers

nutrient (nü'-trē-ənt) a nourishing substance; food

organic (ôr-gan'-ik) relating or characteristic of living things

organic matter (ôr-gan'-ik mat-ər) substance in the soil that comes from plants and animals

output (out'-put') a product produced by a farm or business

pasteurize (pas'-chər-iz) using heat to destroy harmful bacteria

pesticide (pes'tə-sīd) a product used to destroy plant and animal pests



Glossary

poultry ('pol-trē) domesticated birds kept for eggs or meat

precision agriculture (pri-'sizh'ən ag-ri,kəl-chər) use of technology to help increase a farm's profits and efficiency while protecting the environment

predator ('pre-ət-ər) an animal that preys, destroys, or devours

profit (prof'it) the money left after a business pays its expenses

rendering (ren'-dər-ing) process of separating fat from meat or animal remains by slow heating

sap (sap) the liquid inside plants which carries food and nutrients

shear (shir) to cut wool or fleece from a sheep; to shape a tree or shrub

soil (soil) the fine rock mixed with plant and animal matter, making up that part of the earth where plants grow

specialty crop (spesh'-el-te krop) a product grown for its special quality or particular characteristic

spigot (spig'-ət) a valve or faucet for controlling the flow of water or other liquid

stallion (stāl'liən) a male horse

stocker (st-ä-kər) a fish that is midway through its growth cycle

sustainable (sə-stān'-ə-bəl) method of harvesting or using a resource so that the resource is not depleted or permanently damaged

synthetic (sin-thet-ik) something that is manufactured or artificially made

tap (tap) to drill a hole in a tree to allow the sap to run out

till (til) to prepare land for growing plants

tuber (tü'-bər) the thick part of an underground stem

turf (tûrf) a layer of matted earth formed by grass or plant roots

udder (ud'-ər) the mammary gland of a cow, goat, or other animal where milk is produced

veal (veel) the meat from a calf

veterinarian (vetərənər'ē-ən) a doctor for animals

yield (yē-ld) to produce



Thank you to the following sponsors for assisting with the distribution of this book:

Barron Electric Cooperative

Bank of Prairie du Sac

GNP Company

Kewaunee County Farm Bureau

La Crosse County Dairy Promotions

Manitowish Cranberry Company, Inc.

Manitowoc County Farm Bureau

Rock County Farm Bureau

T H Agri-Chemical, Inc.

Wisconsin Christmas Tree Producers Association

This book is provided by Wisconsin Ag in the Classroom:



and funded through the Wisconsin Farm Bureau Foundation.



Thank you to the following sponsors of this book:



**WISCONSIN MILK
MARKETING BOARD**

WISCONSIN DAIRY PRODUCERS

W I S C O N S I N
SOYBEAN
P R O G R A M



**Waukesha County
Farm Bureau**



Dodge County
Dairy Promotion
Committee

