

Started in 1985, the Minnesota Agriculture in the Classroom program (MAITC), is a unique public/private partnership between the Minnesota Department of Agriculture and the MAITC Foundation. The program goal is to advance agricultural literacy to all learners, especially K-12 students and educators. MAITC's mission is "to promote understanding and awareness of the importance of agriculture."

We are pleased to offer the free AgMag series for kindergarten, first, and second grades (AgMag K, AgMag 1, and AgMag 2). Each issue is written and targeted to each specific grade level from K-2 (for 4<sup>th</sup>-6<sup>th</sup> grade students, MAITC offers a separate publication called simply AgMag). We publish two issues each school year, in October and March. Enjoy!

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#### Why Ag in the Classroom?

Previously, people were very aware of the role agriculture played in their lives—it meant survival. Nearly everyone—men, women, and children—worked the land.

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

- Fewer than 2 out of 100 Americans work directly in production agriculture (farming). This small group meets the food and fiber needs of the nation as well as many people abroad.
- Agriculture, along with its related occupations, is one of the nation's largest industries. It generates billions of dollars each year; one out of every five jobs depends on it in some way.

Agriculture is constantly changing. But one thing remains the same: Agriculture is a vital part of your day! Even as early as the primary grades, it's important for students to gain an understanding and appreciation for the ways agriculture touches their lives, each and every day. Food doesn't magically appear in the grocery store or on the kitchen table. It all starts with agriculture.

Box:

Minnesota Academic Standards Connection

Subject	Standard Code	Benchmark
Social Studies	1.4.2.4.2	Compare and contrast buildings and other technologies from earlier times and today.
Science	1.1.1.1.1	When asked "How do You Know?", students support their answer with observations
Science	1.4.1.1.11.4.2.1.1	Recognize that animals need space, water, food, shelter and air.

Science	1.4.3.1.2	Recognize that animals pass through the same life cycle stages as their parents.
English Language Arts	1.2.7.7	Use the illustrations and details in a text to describe key ideas.

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## Glossary

**AGRICULTURE:** Growing plants and raising animals that people use for food, clothing, and many other things every day. It's also harvesting those farm products and getting them to us so we can use them. Agriculture is the industry that grows, harvests, processes, and brings us food, fiber, fish, forests, sod, landscaping materials, and more. It uses soil, water, sun, and air to produce its products. The process starts on farms, orchards, gardens, and ranches with the growing and the harvesting of crops and livestock, then moves to processing plants before finally traveling as finished products to stores, farm markets, lumberyards, greenhouses, and more where consumers buy the products. Agriculture is connected in some way with almost everything we eat, wear, and use.

**Quote from an Unknown Source:** "Agriculture is not simply farming. It's the supermarket, the equipment factory, the trucking system, the overseas shipping industry, the scientist's laboratory, the houses we live in, and much more. It has an effect on the air we breathe, the ground we walk on, the water we drink, and the food we eat."

**CROPS:** Plants which are grown and harvested to feed people and animals or to make other things people need.

**EQUIPMENT:** Supplies and tools that are needed to do certain tasks.

**FARM:** Areas of land where plants and animals are grown or raised for food, clothing, and more.

**FARMER:** A person who lives and works on a farm (also called producers). Farming is a career; farmers make money by selling their farm products.

**HARVEST:** When crops are ripe or mature, they are removed from fields or gathered, and this is called harvesting.

**SHELF LIFE:** The time a product can stay in the store before it starts to lose freshness. Milk shelf life dates are printed on the cartons and bottles. The milk will still be fresh for a few days after the date shown. Shoppers need to check shelf life dates on the milk they buy so they know it is still good to use.

## AgMag 1 Cover—From the Farm to YOU! (Science, Social Studies)

(See Agriculture in the Glossary. The goal of the spring AgMag 1 is to continue sharing the story of agriculture with first-grade students and inspiring them to see the impact that agriculture has on their everyday lives.)

**Note to Teachers:** Depending on the reading levels in your classroom, you may have to help your students with the activity instructions.

This page introduces the concept that not all foods and animals are grown in the same places, nor are they all sources of food for us. Students will be asked to think about what each plant and animal shown gives us. Things like zebras and lions are not food sources here. The rest of the plants and animals shown do provide food for us, and there is a list of potential answers below.

1. The activity on the cover asks the students about foods not grown in Minnesota, such as pineapples, peanuts, and bananas. Some of your students may have never thought about what is grown here and what isn't. Before they do that activity, talk to them about how Minnesota weather is too cold for some kinds of foods to grow, or Minnesota doesn't have the right kind of soil. Get them to think about things that need warmer climates (citrus fruits, etc.) than we have here.
2. What is the difference between farm, zoo or wild animals, and pets?
  - o (Farm animals are raised to provide products that make human lives better. Farm animals give meat, milk, eggs, fiber [wool], hide [leather], feathers, and more. Some give

- help with work or transportation [horses, oxen, mules]. Animal fats are used in making lotions, soaps, film, plastics, medicines, and more.)
  - (Zoo animals live in public places for people to see and study. Wild animals are an important part of the natural world environment wherever they live. Sometimes people go on trips and safaris to see wild animals in their own settings.)
  - (Pets are companion animals, kept for the pleasure and company they provide.)
- 3. Why are zebras and lions not raised on Minnesota farms? (They do not provide food or clothing products. They are not easily tamed, so may be dangerous. Minnesota's cold winter climates are too harsh for them.)

**Find It! activity answers:**

- **Circled Plants:** Apple, pepper, sunflower, potato, corn
- **Circled Animals:** Goat, dairy cow, chicken, horse, sheep, pig, turkey

**Think and Write activity answers:**

**Animals:**

- Goat (milk, meat, goatskin)
- Cow (milk, meat, leather)
- Chicken (eggs, meat, feathers)
- Horse (rides for pleasure and transportation, help with work, entertainment (rodeos), horsehide leather)
- Sheep (wool, meat, sheepskin, oils, occasionally milk)
- Pig (meat, pigskin)
- Turkey (meat, feathers)

**Plants:**

- Sunflower (seeds, oil)
- Pepper (fruit)
- Apple (fruit, applesauce, juice, cider)
- Corn (food for people and animals, corn oil, corn syrup, ethanol)
- Pineapple (fruit, juice)
- Peanut (nuts, peanut butter, peanut oil)
- Banana (fruit)
- Potato (food such as French fries, chips, etc.)

**Page 2-3—Moo to You (Science, Social Studies)**

Guide students through the story of milk, from the farm to their tables. The AgMag magazine has a reference to a video tour of a dairy farm, which you can find here:

<https://www.youtube.com/watch?v=jaS0DdWX1mI>

Have your students watch this first, then continue with the lesson.

Added discussion items:

**On the Farm**

1. How do farmers take good care of their cows?
  - (Cows are kept comfortable and safe from the weather in barns. They have clean bedding [straw, shredded newspapers, mats, waterbeds, sand, etc.] to lie on. They get good nutritious feed and fresh water. If they are sick, the farmer may call an animal doctor [veterinarian] to care for them. In nice weather, they go outdoors to exercise and graze.)

2. What do cows eat?
  - (In warmer months, they graze in pastures and eat grass. In colder months, they eat hay [dried grasses], silage [chopped corn], and haylage [chopped hay]. The farmer gives them a special feed mixture called a ration all year round, which is made of ground grains with minerals and nutrients added. A cow may drink enough water to fill a bathtub every day!)
3. What is the farmer doing with the milking machine?
  - (She is milking cows. The cow's milk is stored in a body part under the cow called an udder. The udder has four teats. The farmer carefully washes the cow's udder and teats before milking. The milking machine attaches to the teats. A steady pulsating pressure gently squeezes the milk out of each teat, similar to when a child sucks his/her thumb. It does not hurt the cow at all. The milk goes through the tubes you see in the picture to a pipe that takes it into a cooling tank.)
4. Do all cattle give milk?
  - (No, only a cow that has had a calf gives milk.)
5. How often are cows milked? How much milk do they give?
  - (Most are milked twice or three times a day. The amount of milk a cow gives depends on her breed and how long it has been since she had a calf. The Holstein breed gives the most milk. Cows give the most milk after a new calf is born. A good cow will give eight or more gallons of milk a day.)
6. The cows on this page are dairy cows. Other cattle, called beef cattle, are raised for meat.
7. People around the world drink milk from more than just cows. What are some of these animals?
  - (Goats, bison, camels, reindeer, sheep, water buffalo, moose, donkeys, horses, and yaks)

### **On the Road**

Tank trucks come to the farm and pump the milk out of the farmer's cooling tank. The driver tests the milk to make sure it is healthy and clean. Then it goes into the refrigerated tank on the truck. The tank truck visits many farms to pick up milk, and then hauls its load to a processing plant.

1. Why must milk be kept cool all the way from the farm to you?
  - (Milk spoils and sours quickly if it is not kept cool. Tiny bacteria grow fast in warmer temperatures, causing the milk to spoil. Farmers, truckers, and plant workers do their part, but we need to keep milk cool in our refrigerators at home, too.)
2. Does all milk go to a processing plant?
  - (Yes, but not all plants put milk into bottles and cartons. Some plants use milk to make ice cream, cheese, butter, yogurt, or other dairy products.)

### **At the Plant**

When milk gets to the processing plant, it is tested again to make sure it is safe from harmful things before it is unloaded. It is strained through a filter to make sure it is clean. It is heated to kill any germs (pasteurized) and mixed so the cream in the milk stays blended instead of rising to the top (homogenized). Finally, it is piped through large machines that fill cartons and bottles. The milk is then loaded into refrigerated trucks and hauled to stores.

1. Why is it so important to keep checking and testing the milk?
  - (Everyone from small babies to great-grandparents will drink and use the milk. It must be clean and healthy so no one gets sick.)
2. Everyone who handles milk must keep all the milk tanks, tubes, pipes, and machines absolutely clean. Why is this so important?

- (Milk spoils and becomes unsafe for people to use if it picks up germs from unclean equipment. Milk equipment is cleaned with hot, soapy water many times a day.)

### **At the Store**

1. Why are there so many different kinds of milk at the store?
  - (People want different kinds and sizes of milk.)
2. Why are there dates on milk cartons and boxes?
  - (The dates tell us how long the milk will be fresh and good to use. If the date has gone by, we should not buy the milk. See SHELF LIFE under GLOSSARY.)

### **You Drink the Milk**

1. What kinds of milk do you like to drink?
  - (Different kinds include skim, 1%, 2%, whole milk, flavored, buttermilk, dry/powdered, evaporated, canned, and more.)
2. What foods can you name that are made from milk?
  - (Cheese, cottage cheese, yogurt, ice cream, butter, sour cream, frozen yogurt, etc.)
3. Why are milk and dairy products such as cheese, cottage cheese, and yogurt healthy for you?
  - (They are a good source of nutrition, with calcium for strong bones, teeth, and muscles. They also have protein for healthy hair, skin, blood, and more. Milk has added vitamin D. Children should have at least three servings from the dairy group every day.)

### **Draw It!**

Have students draw pictures of foods made from milk.

### **Practice**

Have students count the number of times the word “milk” is used on pages 2-3. (The answer is 16—or 17, if you include “milking,” and 18 if you include the one they write.)

Moo to You: Draw a circle around the stage of dairy processing that they are most interested in. Ask them why that’s interesting.

### **Suggested activity:**

Milk is a good basis for an extra math activity around liquid measures. If you can, bring in liquid measuring tools in cup, pint, quart, and gallon measures. Ask the students to guess how many cups fit in a pint, how many pints in a quart, etc. Then have them fill the cup and pour it into the pint and so on. You can also ask students how many cups of milk they drink each day and help them figure out if that’s a pint or quart or more.

## **Page 4—Farm Equipment, Old and New**

### **Discussion Prompts**

Ask students to discuss why newer equipment helps farmers grow more crops and raise animals. (New equipment is more efficient, also faster than going by hand. Milking cows by machine means farmers can milk much more quickly and also have larger herds.)

### **Raising dairy cattle**

Expand on the old and new by telling students about the “then and now” of raising dairy cattle, using this information:

On dairy farms, farmers often grow corn and soybeans to use as feed for their cattle. In the old days, farmers had to push plows by hand, or attach the plow to a horse and steer the horse. It was labor-intensive and slow. Today plowing is done by large tractors that have more power and are much more efficient.

In the old days, farmers used to use a tool called a corn binder to harvest corn. It was like a large, sharp scissors. Binders cut the cornstalk near the ground and piled the stalks together. Today farmers have combine harvesters. They are like large tractors that can harvest corn much faster than the binders could.

Farmers used to milk cows by hand. Given that cows need to be milked two to three times per day, that would take a large amount of time. It also limited the number of dairy cows they could have. Milking machines have streamlined that process and made it possible for dairy farms to expand.

### **Activity: Long Ago and Today**

Look at this photo of a dairy barn from years ago. Now look at the photo of a modern-day dairy barn. Compare the two photos. What looks different? What looks similar?

### **Page 5—Animal Babies and Parents**

This page will help students understand the differences and similarities between animal babies and parents—something they have in common with human babies and parents. Explain that some animals can stand up shortly after they're born and can learn to walk quickly, unlike humans. They also become adults much more quickly than humans do.

### **Activity: Alike and Not Alike**

You can have the students work on the Venn diagrams individually, or you can have it be a large class activity. Another alternative is to make lists for each (adult and baby), then circle the ones that are the same.

Have the students look at the photo of the cow and calves and discuss the ways they look alike and the ways they are different. Then have them draw a Venn diagram on a sheet of paper and list those differences and similarities.

### **Did You Know**

The cow and calves on page 5 are examples of the Holstein breed. Have students study their black-and-white patterns to see just how different spot patterns can be.

### **Page 6—Farmers Make Great Pizza!**

Fun Fact: As a nation, we eat 100 acres (100 football fields) of pizza per day. That's 350 slices every second! Most Americans prefer pepperoni on their pizza.

Pizza Picks: This activity represents an easy logic exercise. Depending on your children's experience with similar activities, you may want to vary the directions to match your group. For example:

1. Joe does not like pizza with meat or cheese. Put a smiling face under the pizza he likes.
2. Ann likes pizza with toppings that begin with the same letter as "pizza." Put a smiling face under the pizza Ann likes.
3. Juan likes pizza with no meat or vegetables. Put a smiling face under Juan's choice.

**Note:** As an added activity, some teachers have students put an X under the pizzas each child does not choose.

Answers: Juan likes cheese. Joe likes veggie. Ann likes pepperoni.

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