Cows To Cones

Suggested Grade Level: K-2

Time: 60 minutes

Subject: Social Studies, Goods and Services, Food Production Systems, Math, Counting and Cardinality, Measurement and Data, English Language Arts, Informational Reading, Speaking and Listening, Writing, Research, Agriculture, Animal Science, Farm to Plate

Overview: In this cross-curricular lesson, K–2 students explore how milk is transformed into ice cream. Students engage with real dairy products, collect and graph class data on favorites, and listen to a read-aloud to learn the production process. They then sequence and retell the steps using a hands-on bracelet activity, building understanding of food systems while integrating math, literacy, and agriculture concepts.

Objectives:

1. Sequence the steps in the production of ice cream from farm to table using visual and oral representations
2. Collect and interpret data by conducting a class survey, using tally marks, and creating a simple graph of favorite dairy products
3. Identify and categorize dairy products derived from cows and explain their origin within a food production system
4. Retell a process using key details with the support of visual aids (bracelet and sequencing cards), demonstrating understanding of informational text
5. Engage in collaborative discussions by sharing observations, asking questions, and responding to peers about food sources and production

Background Information:
Every morning, millions of Americans pour milk into cereal bowls, spread butter on toast, or slice cheese for sandwiches – but before dairy finds its way to our countertops, it starts on a dairy farm. First, dairy cows are milked. In the past, this was done by hand – but nowadays, cows are milked in a milking parlour/parlor (a room full of machines used to milk a large group of cows at once) or a fully automatic milking system. According to the American Dairy Association Northeast, cows are typically milked two to three times per day. This routine prevents the cows from feeling discomfort from overfilled udders and ensures consistent milk production. The amount of milk cows produce in a day varies based on breed, genetics, diet, age, health, and overall management – but typically, a dairy cow can produce about six to seven gallons (23 to 27 liters) of milk per day (American). Next, the milk is stored in insulated tanks to keep it cold (less than 38°F). This keeps the milk fresh and prevents harmful bacteria from multiplying. At this point, the milk is usually tested to ensure that it is safe to eat and

drink. After the milk is tested, it gets loaded onto tanker trucks. A tanker truck is a type of truck with a large, cylindrical tank made out of stainless steel or aluminum. The tanker truck delivers the raw milk to a dairy manufacturing plant, where it is transformed into the dairy products we know and love through a series of chemical processes. Upon arrival, the raw milk is heated to kill harmful bacteria, ensuring that no one gets sick from drinking or eating the products. Then several processes are used to turn it into various food items. For example, to make ice cream, milk is mixed with cream and sugar, then chilled and churned as it freezes. Once these products are packaged and ready, they're shipped to grocery stores, schools, and homes across the country (Dairy). It takes a lot of teamwork to turn fresh milk into the dairy foods we enjoy every day!

Kansas Connections:
Kansas is a key player in the United States dairy industry, ranking 17th in the country for milk production. In 2023 alone, Kansas dairy farmers produced 4.2 billion pounds of milk—about $1 billion in value. Producing and moving this much milk takes teamwork, and dairies help create jobs for dairy farm workers, tanker truck drivers, veterinarians, and more. In fact, the Kansas dairy industry supports about 3,577 jobs that benefit families and businesses across the state! Dairy farms also have a significant impact on Kansas's small towns: each cow on a Kansas dairy farm generates more than eight thousand dollars for the local economy. There are about 193 licensed dairy cattle herds in Kansas – that's a lot of Kansas cattle! From farm to plate, the Kansas dairy industry plays an important role in the state's economy and daily life (Kansas).

So, what's behind the milk? Let's look at two Kansas businesses that play a significant role in the Kansas dairy industry. Dairy Farmers of America, headquartered in Kansas City, is a farmer-owned cooperative, meaning dairy farmers who have come together as one large business to market and process their milk. DFA also owns brands like Borden, TruMoo, and Sport Shake. Hildebrand Farms Dairy, based in Junction City, is a family-run operation that sells milk in signature glass bottles at about 150 retail locations across Kansas. Their products include whole, 2%, skim, creamline, and flavored milks, as well as ice cream mix, butter, and cream. When it comes down to it, behind every ice cream cone is a dairy farmer. Whether they're part of a large cooperative like DFA or running a family farm like Hildebrand, they're the ones caring for cows and making sure milk is clean, safe, and ready to be turned into something delicious. So next time you grab a scoop of ice cream, thank a dairy farmer!

Materials:
Engagement
- Optional: Cow costume, cow headband, or cow t-shirt
- Dairy products: milk, butter, cheese (different kinds), yogurt, ice cream, sour cream, whipping cream, cottage cheese, etc.

Activity 1: Graphing Favorite Dairy Products
Per student
- Dairy Products Graphing Worksheet
- pencil
- three crayons

- clipboard

Activity 2: Story Retelling Bracelet

- "From Milk to Ice Cream" by Stacy Taus-Bolstad
- Sequencing Cards
- Pocket Chart

Per student

- 1 pipe cleaner for bracelet
- Pony Beads: one black, one gray, one white, one pink, one brown for each student

Instructional Format:

1. Review Background Information and Kansas Connections.
2. Conduct engagement exercise.
3. Complete Activity 1: Graphing Favorite Dairy Products.
4. Lead a class discussion.
5. Complete Activity 2: Story Retelling Bracelet.
6. Review vocabulary.
7. Conduct assessment exercise.

Engagement: To spark curiosity and interest, you could begin this lesson dressed as a cow (costume, headband, t-shirt, etc). Lay out real dairy products on a table (yogurt, ice cream, sour cream, milk, butter, various cheeses, whipping cream, etc.) and draw students' attention to them. Allow each student to come up and look at/touch the products. Then, have them sit on the floor with a partner. Direct partners to discuss three sentence starters: "I noticed…" "I think…" "I wonder…"

Procedures:

Activity 1: Graphing Favorite Dairy Products

1. Pick up the milk, yogurt, and ice cream and introduce them as dairy products; ask, "Where do these come from?" and, if a student answers "the store," follow with "How did the store get them?" to guide responses toward "cow" or "farm."
2. Say, "Let's see which one of these three products is our class favorite."
3. Distribute the "Dairy Products Graphing Worksheet," clipboards, and pencils.
4. Instruct students to walk around the room, ask classmates which product they prefer (milk, yogurt, or ice cream), and record responses using tally marks.
5. Once students have finished collecting responses, have them sit down and use three different colored crayons to complete their graphs based on the tally marks they recorded. Guide students throughout the process. Remind them that each graph will look a little different depending on how many classmates they asked.

Discussion

1. Lead a brief discussion about the graph results. Highlight the most and least popular choices, and allow students time to discuss.
2. Transition to the next activity by saying, "Since ice cream is one of our favorites, let's learn more about how ice cream is made."

Activity 2: Story Retelling Bracelet

1. Read “From Milk to Ice Cream” by Stacy Taus Bolstad aloud to the class.
2. Distribute picture and word cards to students. Use a pocket chart to guide the class in sequencing the steps of ice cream production in order.
3. Next, announce that you will be creating a Story Retelling Bracelet.
4. Hand out pipe cleaners and five beads (black, white, brown, pink, gray) to each student.
5. As you orally retell the steps for making ice cream (using the sequenced cards in the pocket chart), students add one bead for each step. After each step, they turn to a partner and retell that part of the process. Step 1 = black bead, Step 2 = white, Step 3 = brown, Step 4 = pink, Step 5 = gray. Feel free to substitute bead colors as needed.
6. Invite students to either grab their iPad or device to record themselves retelling the steps, or pair up and verbally retell the process using their Story Retelling Bracelet as a guide.
7. Go over the Career Information with the class. Then, watch the video “How Ice Cream Is Made” https://www.drink-milk.com/video/how-ice-cream-is-made/ to give students another perspective on the production process. The video includes captions that can be read aloud to support comprehension and reinforce key steps.

Vocabulary:

- **Farm:** a place where people grow crops and raise animals for food or other products.
- **Farmer:** a person who grows crops or raises animals for food or other products.
- **Dairy:** food made from milk, like cheese, yogurt, butter, and ice cream.
- **Milking Parlour (Parlor):** a room on a dairy farm where machines are used to milk many cows at the same time.
- **Flavoring/Flavors:** liquids added to ice cream to make different tastes
- **Tanker Truck:** A kind of large truck that transports liquids like milk

Kansas Standards:

History, Government, and Social Studies

Standard 1: Choices have consequences.

1.1 The student will recognize and evaluate significant choices and consequences that have impacted our lives and futures.

1.2 The student will analyze the context and draw conclusions about choices and consequences.

1.4 The student will use their understanding of choices and consequences to make a claim or advance a thesis using evidence and argument.

Standard 3: Societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.1 The student will recognize and evaluate how societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.2 The student will analyze context and draw conclusions of how societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.3 The student will investigate and connect how societies are shaped by the identities, beliefs, and practices of individuals and groups with contemporary issues.

3.4 The student will use their understanding of how societies are shaped by the identities, beliefs, and practices of individuals and groups to make a claim or advance a thesis using evidence and argument.

Language Arts
Kindergarten
Reading: Informational
Key Ideas and Details
RI.K.2 With prompting and support, identify the main topic and retell key details of a text.
Range of Reading and Text Complexity
RI.K.13 Actively engage in individual or group readings of informational text with purpose and understanding.
Writing
Research to Build and Present Knowledge
W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).
W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
Language in Writing
W.K.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.
Speaking and Listening
Comprehension and Collaboration
SL.K.1 Participate in collaborative conversations with diverse partners about topics and texts with peers and adults in small and larger groups to expand language comprehension.
SL.K.2 Confirm sequence of events of a read aloud or media presentation by asking and answering questions about key details or requesting clarification of what is not understood.
1st Grade
Reading: Informational - RI.1.2 Identify the main topic and retell key details of a text.
Language in Writing
W.1.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.
Speaking and Listening
SL.1.1 Participate in collaborative conversations with diverse partners about topics and texts with peers and adults in small and large groups to expand language comprehension.
SL.1.2 Ask and answer questions about key details in a text read aloud, information presented orally or through media.
2nd Grade
Reading: Informational
RI.2.3 Describe the connection between a series of historical events, scientific ideas, or concepts, or steps in technical procedures in a text.
Research to Build and Present Knowledge
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
Language in Writing
W.2.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.
Speaking and Listening
SL.2.1 Participate in collaborative conversations with diverse partners about topics and texts with peers and adults in small and larger groups to expand language comprehension.

SL.2.2 Recount or describe key ideas or details from a text read aloud, information presented orally or through media.

Math

Kindergarten

Counting and Cardinality

K.CC.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (e.g., by using matching and counting strategies). Include groups with up to ten objects.

1st Grade

Measurement and Data

1.MD.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

2nd Grade

Measurement and Data

2.MD.11. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

National Agricultural Literacy Standards:

Plants and Animals for Food, Fiber, and Energy

- Identify animals involved in agricultural production and their uses (i.e., work, meat, dairy, eggs) (T2.K-2 b.)
- Identify examples of feed/food products eaten by animals and people (T2.K-2 c.)

Food, Health, and Lifestyle

- Recognize that agriculture provides our most basic necessities: food, fiber (fabric or clothing), energy, and shelter (T3.K-2 b.)

Culture, Society, Economy, and Geography

- Trace the sources of agricultural products (plant or animal) used daily (T5.K-2 f.)

Supporting Resources:

Dairy Byproducts Poster
https://ksagclassroom.org/supporting-resources/dairy-byproducts/
Dairy Fun Facts Poster https://ksagclassroom.org/supporting-resources/dairy-fun/
From Milk to Ice Cream by Bridget Heos
https://www.barnesandnoble.com/w/from-milk-to-ice-cream-bridget-heos/1126528459
From Milk to Ice Cream by Stacy Taus-Bolstad
https://lernerbooks.com/shop/show/12829
Ice Cream by Elisha Cooper
https://ac.teachingbooks.net/annotations.cgi?id=11304#t_cid_1
Ice Cream: The Full Scoop by Gail Gibbons
https://agclassroom.org/matrix/companion-resources/1223/
“It’s a Moo-stery” Lesson by Illinois Agriculture in the Classroom
https://www.agclassroom.org/matrix/lesson/15/
Kansas Dairy Poster https://ksagclassroom.org/supporting-resources/kansas-dairy/

Kids Connection Magazine “More Than Milk”
https://www.ksagclassroom.org/resource/connection/

Career Information: Dairy Farmer
Without dairy farmers, there would be no dairy products – no milk, no butter, no cheese, and no ice cream. Dairy farmers work hard to care for cows, often working long, late hours to get the job done. They are responsible for raising, feeding, and milking cows and are held to very high standards for safety and quality. Many dairy farms are family-owned, so most dairy farmers learn through years of hands-on experience. However, some go to college to study animal science or business to improve their family farm or build their own from the ground up. Successful dairy farmers are often hardworking, dependable, and practical, with a knack for business.

Assessment:
Exit Ticket: Hand out a blank piece of paper and ask or write the statement on the board. Students write the answers or sketch a picture and turn them in.
Ice cream is made with _____ which comes from a _____.
Answer: Ice cream is made with **milk,** which comes from a **cow**.

Author: Nancy Smith, first-grade teacher at Heatherstone Elementary and 2019 KFAC Teacher of the Year, KFAC Curriculum Advisory Team; edited by Marissa Cook, Secondary Art Education Major at Kansas State University, KFAC Intern.

References:

American Dairy Association North East. (n.d.). *Dairy Farm Facts*. Retrieved October 24, 2025, from https://www.americandairy.com/dairy-farms/dairy-facts/

Dairy Farmers of America. (n.d.). *Farm to You*. Retrieved October 24, 2025, from https://www.dfamilk.com/farm-to-you https://www.kla.org/dairy/kansas-dairy-facts

Kansas Livestock Association. (n.d.). *Kansas Dairy Facts*. Retrieved October 24, 2025, from https://www.kla.org/dairy/kansas-dairy-facts

Dairy Products Graphing Worksheet Name: _____

Favorite Dairy Products Tally Marks

1. The most favorite was...

_____

_____

2. The least favorite was...

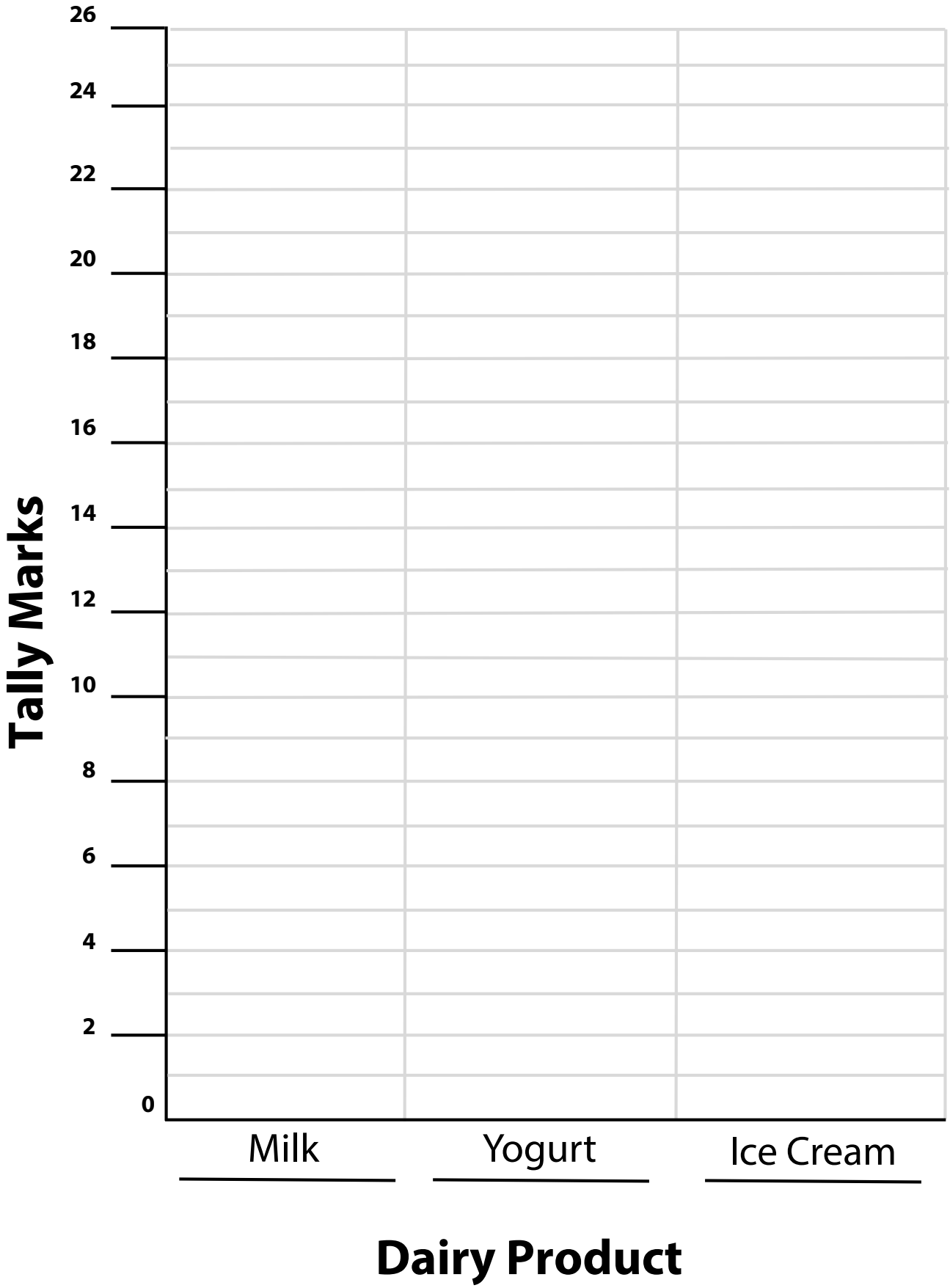
_____

_____

3. Write a number sentence to show how many students liked milk and yogurt the most.

____ + ____ = ____

4. What is the total number of kids who liked ice cream the most? _____


26
24
22
20
18
16
14
12
10
8
6
4
2
0
Tally Marks
Milk
Yogurt
Ice Cream
Dairy Product

First, a farmer uses a machine to milk the cows. The milk is cooled, and trucks take the milk to an ice cream factory.

Next, the milk is mixed with sugar. The mix is heated to kill germs, then cooled. Flavors are added.

Then, the ice cream is mixed and squirted into buckets or boxes.

After that, the ice cream is frozen and loaded onto trucks for delivery to stores.

Finally, people buy the ice cream and take it home to eat it…yum!