Adopt A Cow Lesson 1

Objectives:

- Students will identify 4 to 5 items a calf needs after it is born.
- Students will identify important vocabulary related to the lesson.
- Students will explain and describe how farmers raise healthy cows.

Approximate Lesson Length: 40 to 45 minutes (additional time for activities)

Materials Needed:

- Adopted Calf PowerPoint
- Optional: Copies of “Compare and Contrast Cows and Humans” Worksheet
- Optional: Materials from maker space environment to build a cow stall
- Optional: Copies of “Design Sheet” and “Assessment Rubric”
- Optional: Computer or paper and pencil for Evaluation 1
- Optional: Copies of “Dairy Vocabulary” worksheet for Evaluation 2

Lesson Components:

Component	Time	Component	Time
Motivator & Discussion	5 min.	Build a Stall STEM Project	80 min.
PowerPoint & Discussion	45 min.	Creative Drawing A	20 min.
Compare and Contrast	15 min.	Creative Drawing B	20 min.
School Milk Activity	10 min.	Prompt Response	15 min.

Motivator:

Ask students where their milk comes from. Most students tend to answer that it comes from the store. If that is the case then ask, where does the milk come from for the store to sell? Explain that the store has to get the milk from the cows on the dairy farms. Explain that a dairy farm is a farm that breeds and raises cows for the purpose of producing milk for sale to people and stores.

Vocabulary: Use the “Dairy Vocabulary” sheet for definitions

Pre K - K	Grades 1 - 2	Grades 3 - 5	Grades 6 - 8
Calf	Sire	Total Mixed Ration	Health Records
Cow	Dam	Veterinarian	Vaccination
Milk	Dairy	Herdsman	Ruminant
Dairy Farm	Colostrum	Nutritionist	Agriculture
Bedding	Stall Barn	Agriculture	Ventilation System
Farmer	Breed	Heifer	
	Hutch	Navel	

PowerPoint Lesson:

Elicit the background knowledge of your students by asking them to share things they know about cows. As students share their ideas, record them on a chart for the room. Save space at the end to add more facts throughout the updates about your adopted calf.

Explain that as a class, you have adopted a cow. As the cow grows, updates will be sent to your class, so the students can learn about cows and the dairy industry.

Slide 1: Using the PowerPoint slides included with your first update, introduce the class to their calf. Before beginning, explain to the students the purpose of the lesson is to learn about how dairy farmers care for the cows from birth to their adult life. Introduce the first vocabulary word for the lesson which is **calf.** Ask students to turn and talk to a partner to brainstorm what things a calf needs to grow and be healthy. Students should respond that the calf needs food, water, shelter, space to move around and air. Some students might mention that the calf also needs to be seen by a veterinarian. After asking students to share, explain that during the PowerPoint they will have a first-hand look at how farmers care for the calf after it is born. Now it is time for them to meet the calf that the class has adopted.

Slide 2: Share with the students that farming is a way of life for the whole family. Although it is the farmer's responsibility to care for the cows, often the whole family works to keep the farm running. As you continue with the slides following the calf, ask students to look for ways that the whole family is involved in helping on the farm.

Slide 3: Ask students if they know what farmers call the mother and father of the calf. If they answer no, then introduce the students to the terms **dam** and **sire**.

Slides 4, 5 & 6: Tell the students that the next few slides show how the farmer has to care for the calf. Explain that the slides will show how the calf gets food, water, air, shelter, and space to move around in to grow into a healthy cow that will produce milk. The bold words on slide four are important vocabulary words. Take time to review **colostrum** and **navel** with the students.

Slides 7 & 8: Tell the students that they are also going to meet the calf's mom. Ask: What is the word that we use for a calf's mom? **(Dam).** Ask: Do you think that a cow needs the same things as a calf to be kept healthy? **(yes).** Share the slides about the calf's mother. Ask students to compare and contrast the food, water, shelter, and space that a cow and calf need.

Slides 9 & 10: Introduce the students to the families that care for and work on the dairy farm and enjoy a landscape photo of the farm.

Questions for Discussion:

1. **What do you think it would be like to run a farm?**
   Answer: It would be hard to run a farm. There is a lot to do to care for each cow and most farms have more than one cow.
2. **How did the calf get everything it needed to survive?**
   Answer: The calf was able to get milk from the feeder, water from the bucket/automatic dispenser, and food from the farmer. It also had a pen to rest in with the other calves.
3. **Can you share one new thing that you learned today?**
4. **How do farmers keep the cows happy in the barn?**
   Answer: Fans to keep cool, a rotating brush to scratch an itch and clean bedding to sleep on.
5. **What was it like for the calf to get an ear tag?**
   Answer: It was just like getting her ears pierced.

Classroom Activities:

Please note: The activities below can be changed or modified to fit different classroom needs. The activities tie in nicely with the lessons. Please choose the activities that are a good fit for your students. Also these activities are not included in the approximate time for the lesson.

1. **Compare and Contrast Cows and Humans:**

   Compare the calf's growth and development to how we as humans grow and develop. How big are we when we are born? How long does it take to become an adult? What do we learn during different stages of our life to aid in our growth and development? Use the "Compare and Contrast Cows and Humans" worksheet to help with the exercise. Suggested level is upper elementary. This activity could be scaffolded for younger students and altered for middle school.

2. **School Milk Activity:**

   Ask the cafeteria how much milk your school drinks each day and figure out how many cows it would take to supply that milk. A typical adult cow produces about 80lbs of milk or 10 gallons a day.

   Hint: You'll be surprised that it's less than you think! Suggested **independent** level upper elementary and middle school. Could be teacher led for younger students.

STEM Projects - Learning Activities:

Students will plan, design, and create either a sample stall for their cows or for older students a cow barn with a sample stall. Using a maker space environment, students will use a variety of donated materials to build a prototype of a barn that they would need to have for the cows on their farm.

A maker space is a place in the classroom which has a collection of donated, found or recycled materials that students can use to build ideas that they have worked together to plan. Teachers will often add a request for cardboard, craft supplies, containers, cardboard tubes, scrap materials or papers, or anything else that can be used to design and build within the classroom.

1. Students work in partners or small groups to use the design engineering sheets to plan the barn that they want to make out of the maker space materials. As students collaborate to design their barn, they have to use what they have learned to ensure that their barn provides what each cow needs to be healthy.
2. Ask students the following questions to get them started.
   - **What does an engineer do?** *Designs things to solve a problem.*
   - **What would an engineer have to keep in mind when designing a barn?** *Having everything that a farm needs to keep cows healthy.*
   - **Can you name some of the things that a cow needs to be healthy?** *Food, water, a comfortable stall and bed, waste management, veterinary care*
3. Break the students into partners or small groups (3 or 4). Review the design sheets with the students. Explain the rules for collaboration:
   - All ideas have to be heard
   - Everyone listens respectfully
   - Everyone works together to make decisions for the plan
   - Everyone records the plan on their own sheet to turn into the teacher

Give students time to plan and design their idea of the best stall or barn. Once the plan and design are approved, students may begin to collect materials and build.

STEM Project Continued...

One way to have students engaged is to allow them to work on their project when they have finished other responsibilities in their reading, writing, or math workshops. Students will work to finish other work to be engaged in this activity. Or students could build only during their science period for 2-3 days as the teacher feels is appropriate for the age.

When students have all finished their prototypes, have them share their barns with the class and use the rubric to evaluate their project.

Differentiation: Younger students could build with class blocks, Legos, or Playdough to make their stall or barn. For older students, teachers can choose to embed as much research to find additional specifics or engineering research as appropriate for the grade that you teach.

Evaluation:

1. **Creative Drawing:**
   A. Students create a physical or digital picture of a happy cow or calf with everything that it needs to continue to remain healthy. The diagram should show the food, water, shelter, and space to move around in which is what all animals needs to survive. It may also include the farmer and the veterinarian.
   B. Students can choose four vocabulary words. Use the “Dairy Vocabulary” worksheet to illustrate each vocabulary word and write an explanation of the vocabulary word below the picture.
2. **Prompt Response:**
   Have students respond to one of the prompts listed below:
   A. Describe the job of a dairy farmer and give examples of how the farmer works hard to raise a calf.
   B. Dairy farmers work hard to keep their cows happy. Explain specific things that a farmer does for their cows.

Dairy Vocabulary Definitions

Agriculture: the science or practice of farming, including cultivation of the soil for the growing of crops and the caring of animals to provide food, wool, and other products

Bedding: decomposable material used to put on top of stall floors to create a comfortable bed for cows to sleep on. Examples: sand, shavings, dehydrated manure, newspaper

Breed: a group of animals descended from common ancestry and possessing certain inherited characteristics which distinguish it from any other group

Calf: young animal of the bovine species, has not reached breeding age

Colostrum: the first milk released from the cow's udder after giving birth that is rich in antibodies

Cow: a mature female bovine who has given birth to a calf and is producing milk

Dairy: food or beverages containing or made of milk

Dairy Farm: a facility that provides housing for dairy cows, managed by a dairy farmer

Dam: the mother of a calf

Farmer: the caretaker of the animals, land and farm—often the one who owns the farm

Health Records: individualized documents that track important moments of a cow's life like milk production, time of vaccinations, date of birth, lactation period, number of calvings, etc.

Heifer: young (less than 3 years) female bovine that has not given birth to a calf

Herdsman: the caretaker and overseer of the cows and their health—often the dairy farmer

Hutch: an individual pen with a shelter and an outdoor area—calves live here for the first few weeks after birth

Milk: an opaque white fluid rich with the thirteen essential nutrients, secreted by female mammals

Navel: the belly button of a bovine

Nutritionist: someone who specializes in the dietary needs of animals and supplies suggested rations and remedies for best cow care and health

Ruminant: animals that have four compartments in their stomach, including the rumen, reticulum, omasum and abomasum

Sire: the father of a calf

Stall Barn: comfy living corridors for cows, can be designed in different ways like a tie-stall barn or a free-stall barn—this is where cows often spend most of their time eating, sleeping and socializing

Total Mixed Ration: a balanced diet calculated by the nutritionist—it provides the perfect amount of each nutrient needed in a cow's diet to live a happy and healthy life

Vaccination: treatment with a vaccine to produce immunity against a disease

Ventilation System: a system installed in barns to provide fresh air to the cows daily and throughout all seasons

Veterinarian: a professional who is trained to treat diseased or injured animals—large animal vets will visit the farm routinely to continuously check up on the herd's health

DISCOVER Dairy

Lesson 1
Compare and Contrast

Name: _____ Date: _____

Compare and Contrast Cows and Humans

Directions: Compare the calf's growth and development to how we as humans grow and develop by completing the blocks below.

Comparing:	People/Children:	Cows/Calves:
What size were they/you when they/you were born?	Height: Weight:	Height: Weight:
How quickly did it take for them/you to double their/your weight?		
How big will they/you be when they/you are grown up? (Estimated)	Height: Weight:	Height: Weight:
How long were they/ you on milk formula or whole milk for the calf?		
How many compart-ments do they/you have in your stomach?		
What does a balanced diet look like for them/ you?		

1. How is a cow's growth and development similar to yours as a person?

2. How is a cow's growth and development different than yours?

DISCOVER Dairy

Lesson 1
STEM Activity
Design Sheet

Name: _____ Date: _____

The Engineering Design Process

1. **What is the problem or challenge?**

2. **Imagine the possibilities! What different types of options can you think of for the project?**

STEM Activity: Design Sheet Page 2

3. **Pick a design idea for the cow barn or stall. Draw and label a diagram of your design. Add any details on the lines below.**

STEM Activity: Design Sheet Page 3

4. **What materials do you need to build your barn or stall? List them below and collect the materials you need to make the map with your group.**

5. **Build your design.**

6. **Were you able to include everything you needed to keep the cows healthy? What did you include? What did you forget?**

7. **Is there any way that you could improve your design? Is so, how would you do that?**

8. **Evaluate and reflect on your design work. How did your team work together and what are you proud of about your design?**

STEM Activity: Assessment Rubric

Name: _____ **Date:** _____

Challenge: _____

3	2	1
Student followed all of the instructions for the challenge.	Student followed some of the instructions for the challenge.	Student did not follow the instructions for the challenge.
Student worked with the group to create an idea to solve the problem.	Student worked with the group to create an idea to partially solve the problem.	Student worked with the group and was not able to create an idea to solve the problem.
Student used his/her best effort and perseverance for the challenge.	Student showed good effort and perseverance for the challenge.	Student did not show effort or perseverance for the challenge.
Student followed the design process during the challenge submitting a plan, constructing a prototype, testing and iterating their design.	Student partially followed the design process during the challenge submitting a plan, constructing a prototype, testing and iterating their design.	Student did not follow the design process during the challenge submitting a plan, constructing a prototype, testing and iterating their design.
Student fully collaborated with all group members and contributed fairly to the group.	Student partially collaborated with all group members and contributed fairly to the group.	Student struggled to collaborate with all group members and/or did not contribute fairly to the group.
Student was able to fully help create a product to share the work of the group.	Student was able to partially help create a product to share the work of the group.	Student was not able to help create a product to share the work of the group.
Student fully contributed to class discussions and activities prior to the challenge.	Student partially contributed to class discussions and activities prior to the challenge.	Student did not contribute to class discussions and activities prior to the challenge.

Total Points _____/ 21

Comments: _____

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DISCOVER Dairy

Lesson 1
Dairy Vocabulary Worksheet

Name: _____ Date: _____

Dairy Vocabulary

Directions: Choose four vocabulary words. Draw a picture of each vocabulary word below. Label the vocabulary word in the picture. On the lines below each picture, explain what the word means.

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DISCOVER Dairy

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