HEALTHY COWS ACTIVITY 1

FARM TECHNOLOGY

Technology has made modern farming more productive. On dairy farms, it also keeps cows healthier and more comfortable. Milking R Dairy of Okeechobee, Fla., uses collars on their cows to monitor the animals' health in real time, much like a fitness watch!

Milking R Dairy of Okeechobee, Fla., uses collars to monitor their cows' health.

Part 1

Cow pedometers can be in the form of an ankle bracelet or a neck collar that cows wear all the time, much like a fitness watch. These track each animal's steps as well as other health and habits of the cows. To see more about this, watch the video of Lindsey Rucks at **https://www.youtube.com/watch?v=gDPGj8zdoDM**. Think about how cow health monitors help farmers take better care of their cows. Then, answer the questions below.

1. How do cow pedometers or collars (sensors) benefit farmers? _____

_____

_____

_____

2. What information do the sensors collect about each cow? _____

_____

_____

3. Why would a cow's number of daily steps change? _____

_____

_____

4. How would a farmer use the information collected by a sensor? _____

_____

_____

Part 2

Modern farmers also use other types of technology and data to care for their farms, solve problems, and improve their results. This is a precision farming approach to farm management. For example, some farmers use satellite and sensor technologies like GIS (Geographic Information Systems) to collect information about their soil, crops, livestock, and even the weather. They use GPS (Global Positioning Systems) to map fields, guide tractors, and check crops, even at night. Check out how Larson Dairy in South Florida uses technology and science to sustainably care for the land they crop to feed their cows at **https://www.youtube.com/watch?v=kkyh0Q1JljM** and **https://www.youtube.com/watch?v=0AVyJlXW3uY**. These tools save time and money. For dairy farmers, it means more time spent caring for the cows themselves.

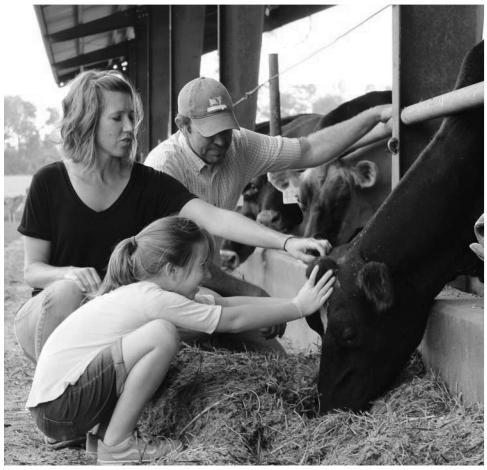
Choose one of the technologies listed in the paragraph above. Research how it is used on modern dairy farms and write down 3-4 benefits it offers to farms, families, animals, and the environment. Write your list on the back of this sheet.

DAIRY COUNCIL OF FLORIDA

YMI YOUNG MINDS INSPIRED

HEALTHY FAMILIES ACTIVITY 2

FARM BIOLOGY



The Austin family in Marianna, Fla., tend to their cows.

Farms are the first biotech labs. Since ancient times, farmers have used *selective breeding* to make the foods we eat more widely available and nutritious. Today, scientific developments have enabled the transfer of specific genes from one organism to another. This process is called *genetic engineering*.

The chart below shows the impact of selective breeding and genetic engineering on modern farming, including examples that improve our food supply. Discuss the chart with your class and then use the space below and the back of the sheet to compare and contrast the two methods.

Part 1

Selective Breeding	Genetic Engineering
Choose parents with traits you want. These will be passed on to the offspring.	Add the gene for the trait you want into the DNA of the organism so it can be passed on to the offspring.
Examples	**Examples**
1. Disease-resistant wheat is created by breeding hardy wheat plants with wheat plants that have a high yield. As a result, families have better access to nutritious grains for a lower cost.	1. Scientists have engineered salmon so that it grows quicker, making the salmon available for market faster. The salmon is grown in controlled environments.
2. By selectively breeding bulls with dairy cows that produce high levels of milk protein, the resulting offspring will likewise produce high-protein milk.	2. Scientists have created a special type of soybean that produces oil with more "healthy" fat and no trans fat, which can raise cholesterol and increase risk of heart disease.
3. Hardy snacking apples are created when a sweet variety of apple is grafted onto the trunk of a fungus-resistant variety. This gives the benefit of higher-producing sweet apple trees that are fungus-resistant. This means more fruit for more families.	3. When scientists added the genes that produce Vitamin A in carrots to white rice DNA, they created "golden rice" — a food rich in Vitamin A for countries where Vitamin A deficiency causes childhood blindness.
Similarities:	
Differences:	

Part 2

Dairy farmers use many other types of biotechnology to improve food production. How does biotechnology on dairy farms support people's nutritional needs? Write your answer on the back of this sheet.

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HEALTHY FARMS ACTIVITY 3

FARM ECOLOGY

Larson Dairies in Okeechobee, Fla., use anaerobic digesters to convert methane, a greenhouse gas released from cow manure, into a source of electricity.

Today's dairy farmers use sustainable farming practices

to protect the environment by conserving energy and water, reducing pollution, and building soil health. Soil health refers to the soil's ability to function as an ecosystem that can support plants, animals, and humans. For more examples of these practices, check out the Moos News at **https://www.youtube.com/watch?v=0AVyJlXW3uY**.

Look at the chart below. Read about the sustainable farming practices in the first column, and then decide if that practice helps conserve energy, conserve water, reduce waste and pollution, or build soil health by putting an "X" in the correct box. You may mark more than one box for each sustainable practice. Then, fill in a way you can help achieve those same environmental goals at home.

	Sustainable Farming Practice	A. Conserves Energy	B. Conserves Water	C. Reduces Waste and Pollution	D. Builds Soil Health	E. What I Can Do
1.	Cow manure is used in place of commercial fertilizer to improve soil quality.					
2.	Methane digesters use the gas given off by cow manure as fuel to generate electricity.					
3.	Some dairy farmers use a device called a plate cooler to cool the milk as it comes from a cow. Cold water passes right from the well through the plate cooler and absorbs heat from the warm milk. Farmers then re-use this water in different ways: as drinking water for cows (who prefer warm water); to cool the cows with a fine spray when it is hot; to wash farm equipment and clean the barn floor.					
4.	Field cover crops keep soil and nutrients in place and reduce runoff.					
5.	Solar panels on the farm generate electricity.					
6.	Recycled materials such as sand, which can be reused time and again, are used as comfortable bedding for the cows.					
7.	Orange peels, cotton seeds, and other leftovers are mixed with grain to provide nutritious cow feed.					

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