STAYING HEALTHY WITH MILK!

Essential Question
How can milk and dairy products contribute to a healthy lifestyle?

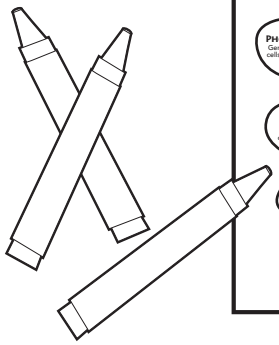
Description of Unit
With the help of SunnyBell, students will examine the vitamins and nutrients that make milk healthy. Students will learn the nutritious value of dairy products and be able to "see" the vitamins, minerals, and proteins in their milk!

Materials needed
For initial lesson

1. **Bulletin Board Builders** – Cow and Dairy Farmer, Cheese (word or image), Yogurt, Milk, Cottage Cheese, Parfait, Smoothie
2. *SunnyBell Presents: Staying Healthy with Milk* **video**

For Extend and Enrich the Learning!

1. *Milk… More Than a Mustache* **learning sheet** – one per student
   Crayons/colored pencils
2. Dairy Science, *Swirling Milk* **lab** – approx. one per every four students
   Flat aluminum pie pan (5-7" in. diameter, 1 in. deep) –
   Milk – whole, 2%, 1%, skim (dry milk if desired)
   Food coloring – red, yellow, blue and green work best
   Dove or Dawn liquid dishwashing detergent
   Toothpicks or cotton swabs
3. **Books** – *The Dairy Group by Helen Frost* – grades K-3
   Dairy by Honor Head – grades K-3
   Milk and Dairy by Louise Spilsbury – grades 4-8
4. **Posterboard** – one sheet for each group of 4-5 students



Vocabulary
- **Dairy** – milk and foods made from milk
- **Bones** – parts of the hard skeleton that makes up human and animal bodies
- **Muscles** – body parts that produce movement
- **Nutrients** – a part of food that plants, people, and animals need to live and grow
- **Calcium** – a substance that helps people and animals have strong, healthy bones
- **Vitamins** – a component of food that allows people to be healthy
- **Proteins** – an important part of the human diet, usually found in milk products, meats, and beans

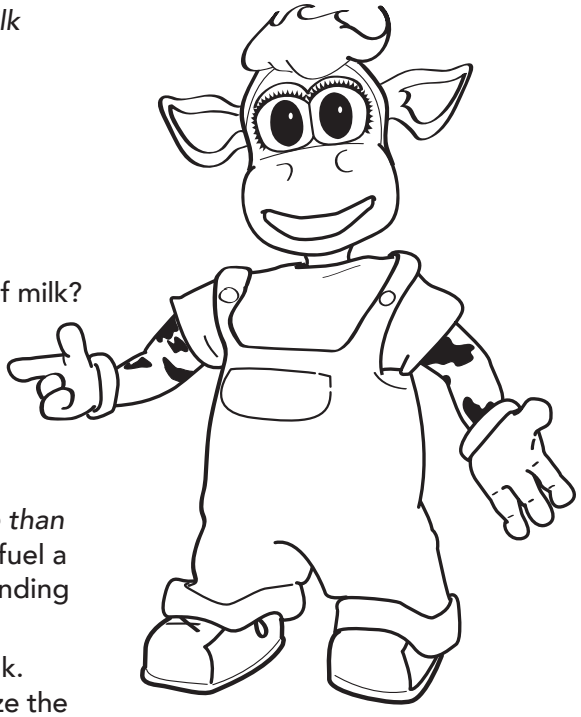
Lesson
Get them excited!
Select 6 students to come to the front of the room. Have cheese, yogurt, milk, and dairy farmer pictures on the board backwards, so the images are a mystery. The selected students can peek at the pictures but cannot reveal the picture until told to do so by the teacher.

Share with the students that today they will be learning how to be healthy by consuming dairy products. First ask if anyone knows where dairy products come from. As the students guess "cow", have the child with the dairy farmer and cow show his/her picture. Explain that dairy products come from dairy cows. Dairy farmers take care of the cows on their farms and help us to have safe dairy products to eat.

Ask the students to recall dairy products people eat regularly. When a student answers with *cheese, milk, yogurt, cottage cheese, a parfait or a smoothie,* have the students in the front of the room show their pictures to the group. If children list any additional dairy foods, add those to a list on the board (chocolate milk, etc.)

Explain that milk is filled with nutrients, vitamins, proteins and calcium.
These components are the parts of healthy foods that make our bodies strong, help us think clearly, add the good fats that our brains need to think, and are essential to us being strong and able to function.

Introduce and Show the *SunnyBell Presents: Staying Healthy with Milk* video included on the resource CD or on youtube at http://www.youtube.com/watch?v=IMI-NPovJIE



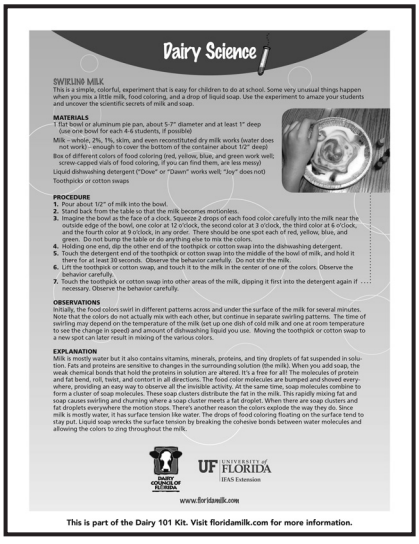
Questions for Learning

Add your own great ideas to our list below!

1. Why does the doctor say SunnyBell is in great shape? (Milk!)
2. Why are nutrients, vitamins, proteins and calcium important parts of milk? (They make strong bones, teeth and muscles.)
3. How can drinking milk now – or eating healthy foods now – help us make a good lifelong habit?

Extend and enrich the learning!

1. In the video, *SunnyBell* gets a milk mustache. Use the *Milk…More than a mustache!* review sheet to explain how the components of milk fuel a body. As each section is discussed, students color in the corresponding bubble with a color of your choice.
2. Ask the students if they would like to *see* some of the parts of milk. Follow the *Dairy Science Swirling Milk lab* to help students visualize the proteins, good fats and water components of milk.
3. As a class, study the following books and ask students how they know what they have learned:
   The Dairy Group by Helen Frost – grades K-3
   Dairy by Honor Head – grades K-3
   Milk and Dairy by Louise Spilsbury – grades 4-8
4. Divide the class into groups and let them share what they know with posters to place about the school!



Dairy Science

SWIRLING MILK

This is a simple, colorful, experiment that is easy for children to do at school. Some very unusual things happen when you mix a little milk, food coloring, and a drop of liquid soap. Use the experiment to amaze your students and uncover the scientific secrets of milk and soap.

MATERIALS

1 flat bowl or aluminum pie pan, about 5-7" diameter and at least 1" deep (use one bowl for each 4-6 students, if possible)

Milk – whole, 2%, 1%, skim, and even reconstituted dry milk works (water does not work) – enough to cover the bottom of the container about 1/2" deep)

Box of different colors of food coloring (red, yellow, blue, and green work well; screw-capped vials of food coloring, if you can find them, are less messy)

Liquid dishwashing detergent ("Dove" or "Dawn" works well; "Joy" does not)

Toothpicks or cotton swaps

PROCEDURE

1. Pour about 1/2" of milk into the bowl.
2. Stand back from the table so that the milk becomes motionless.
3. Imagine the bowl as the face of a clock. Squeeze 2 drops of each food color carefully into the milk near the outside edge of the bowl, one color at 12 o'clock, the second color at 3 o'clock, the third color at 6 o'clock, and the fourth color at 9 o'clock, in any order. There should be one spot each of red, yellow, blue, and green. Do not bump the table or do anything else to mix the colors.
4. Holding one end, dip the other end of the toothpick or cotton swap into the dishwashing detergent.
5. Touch the detergent end of the toothpick or cotton swap into the middle of the bowl of milk, and hold it there for at least 30 seconds. Observe the behavior carefully. Do not stir the milk.
6. Lift the toothpick or cotton swap, and touch it to the milk in the center of one of the colors. Observe the behavior carefully.
7. Touch the toothpick or cotton swap into other areas of the milk, dipping it first into the detergent again if necessary. Observe the behavior carefully.

OBSERVATIONS

Initially, the food colors swirl in different patterns across and under the surface of the milk for several minutes. Note that the colors do not actually mix with each other, but continue in separate swirling patterns. The time of swirling may depend on the temperature of the milk (set up one dish of cold milk and one at room temperature to see the change in speed) and amount of dishwashing liquid you use. Moving the toothpick or cotton swap to a new spot can later result in mixing of the various colors.

EXPLANATION

Milk is mostly water but it also contains vitamins, minerals, proteins, and tiny droplets of fat suspended in solution. Fats and proteins are sensitive to changes in the surrounding solution (the milk). When you add soap, the weak chemical bonds that hold the proteins in solution are altered. It's a free for all! The molecules of protein and fat bend, roll, twist, and contort in all directions. The food color molecules are bumped and shoved everywhere, providing an easy way to observe all the invisible activity. At the same time, soap molecules combine to form a cluster of soap molecules. These soap clusters distribute the fat in the milk. This rapidly mixing fat and soap causes swirling and churning where a soap cluster meets a fat droplet. When there are soap clusters and fat droplets everywhere the motion stops. There's another reason the colors explode the way they do. Since milk is mostly water, it has surface tension like water. The drops of food coloring floating on the surface tend to stay put. Liquid soap wrecks the surface tension by breaking the cohesive bonds between water molecules and allowing the colors to zing throughout the milk.

DAIRY COUNCILS OF FLORIDA

UF UNIVERSITY of FLORIDA IFAS Extension

www.floridamilk.com

This is part of the Dairy 101 Kit. Visit floridamilk.com for more information.

Check for Understanding

Remind students the importance of making healthy habits. Review how milk contains protein, calcium, nutrients and vitamins. This might be a great time to encourage students to learn more about cows, dairy farms, and dairy foods the next time they visit the school library. Encourage them to find dairy foods in the grocery store and keep a list of all the dairy foods they eat in a day.