

# Mammals and Magnificent Milk

Mammals are a class of animals. There are mammals that swim, mammals that fly, and mammals that live on land. How do you know if an animal is a mammal? Well, the two simplest ways to tell are hair/fur and milk. All mammals have at least a little hair or fur somewhere on their bodies. Also, all mammals have mammary glands, meaning they can make milk to feed their babies. Can you think of an animal that has hair and feeds its babies with milk? If so, that animal is a mammal!

Feeding babies with milk is a really special thing that mammals do, but what is so special about milk!? Try the below experiment to explore some of milk's most interesting properties.

## Materials Needed for Experiment:

- Milk (2% or whole milk)
- Food coloring in several colors
- A plate or dish
- Liquid soap
- A cotton swab



## Steps for the Experiment:

1. Pour the milk into the plate.
2. Add several drops of food coloring to the center of the milk. I suggest 3-4 drops of each color.
3. Cover the end of your cotton swab with liquid soap. If you don't have a cotton swab, you can use a toothpick, fork, or even a finger!
4. Touch the soap-covered cotton swab to the center of the milk. What happens to the colors!?
5. Try swirling and moving the cotton swab around the milk dish. What do you notice? You can add more soap if you like.

What is happening in this experiment? Milk contains water, vitamins, minerals, protein, and fat. Soap molecules contain **hydrophilic** (water loving) and **hydrophobic** (water fearing) parts. Have you ever seen a soap commercial where the soap breaks up those "hard to clean" fat or grease spots? That is basically what is happening here! The hydrophobic parts of soap molecules collect and break up the fat in the milk, while the hydrophilic parts of soap molecules cling to the water in the milk. As the soap and milk molecules connect and repel, the food coloring comes along for the ride! This is why we see the colors mixing and churning! This experiment should if the milk has fat in it. Try it with skim milk and see what happens. The fat in milk is one of the reasons mammals make it - the fat is nutritious and helps mammal babies grow!

