

Swirling Milk Experiment

Materials:

- Food coloring
- Liquid dish soap
- Shallow plate or dish
- Whole milk (other milk will work, however the higher fat content the better)

Procedure:

1. Pour some milk onto a plate. Allow the milk to come to room temperature.
2. Add a few drops of different colored food coloring into the plate of milk. (Draw on the data sheet what your plate looks like and make a prediction about what will happen when you add the liquid dish soap)
3. Dip a q-tip into liquid dish soap and touch the center of the milk and food coloring.
4. Watch to see what happens. (Draw and write about what you observed on the data sheet)
5. If the reaction stops, dip q-top into liquid dish soap and touch the milk again.

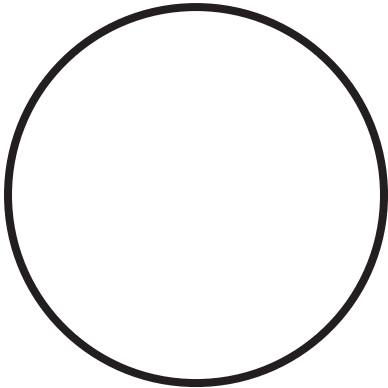
Learn About the Science

After you complete your Swirling Milk Experiment Data Sheet, read through the Science Behind the Swirling Milk Experiment.

Swirling Milk Experiment Data Sheet

Experiment:

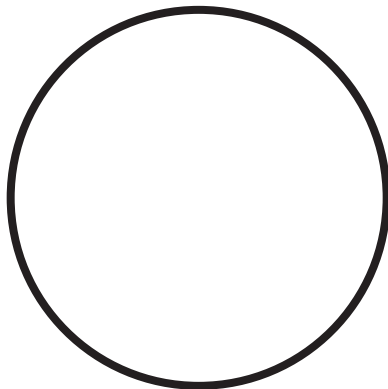
Record where you dropped your food coloring on your milk.



Predict what will happen when you touch the milk with the liquid dish soap.

Observation:

Draw and write about what you observed after putting the soap in the milk.



Science behind Swirling Milk Experiment

What is happening:

The fat in the milk is broken down by the liquid soap. This causes the food coloring to swirl and make some neat designs.

The Science:

Milk contains water and fat (among other things). Dishwashing liquid is made up of micelle molecules, which are lipid molecules that arrange themselves in a spherical form in aqueous solutions. The formation of a micelle is a response to the amphipathic nature of fatty acids, meaning that they contain both hydrophilic regions (water-loving) as well as hydrophobic regions (water-repelling). When you add dishwashing liquid to milk, two things happen. First, it lowers the surface tension of the milk (making it easier for the food coloring to flow around). Second, the hydrophilic part of the detergent molecule dissolves in the milk 'water', whilst the hydrophobic part is attracted to the milk fat. The 'swirling milk' effect is the race for the hydrophobic part of the dishwashing liquid to pair up with the fat globules in the milk, pushing aside everything else. The food coloring doesn't contribute to this process, but it allows us to see what is going on.