Milk Magic
Teacher Resource

Grade Level **k-12**

Objectives

1. The student will develop an understanding of how molecule bonds break and how to alter the shape of molecules.
2. The student will investigate the surface tension of a liquid.
3. The student will employ simple equipment and tools to gather data.
4. The student will demonstrate the use of 21st century technology with a document camera to locate, evaluate, and collect information.

National Standards

NS.K-4.1; NS.5-8.1; NS.9-12.1	Science as Inquiry
NS.K-4.2; NS.5-8.2; NS.9-12.2	Physical Science
NS.K-4.5; NS.5-8.5; NS.9-12.5	Science & Technology
NT.K-12.1	Basic Operations and Concepts
NT.K-12.3	Technology Productivity Tools
NT.K-12.6	Technology Problem-Solving & Decision-Making Tools

Teacher Background Information

This experiment is great to use as a demonstration or allow the students to do these themselves for the best learning experience. In this experiment, the student will experience the breaking of surface tension and the altering of proteins in milk. By adding liquid dish soap to the milk, the proteins bonds and other molecules in milk will break apart or change shape. The student will observe the swirling motion in the milk as the milk and soap form tiny molecules called micelles. Micelles help liquid dish soap fight grease off of dirty dishes.

Eventually equilibrium will be reached and the swirling will slow down and eventually completely stop.

Before each activity have students state a hypothesis.

MATERIALS

Document Camera	2% or Whole Milk
Personal Computer	Wooden Toothpicks
Interactive White Board/Projector	Water
Liquid Dish Soap	Food Coloring
Petri Dish	

PROCEDURE

1. Focus the document camera on the Petri dish and start recording.
2. Pour the milk to cover the bottom of the Petri dish completely.
3. Place a drop of food coloring corresponding with the 3, 6, 9, and 12 face of a clock on the Petri dish.
4. Coat the wooden toothpick in water and place the tip of the swab in the middle of the Petri dish.
5. Hold the tooth pick in place until finished observing.
6. Record observations.
7. Coat the wooden toothpick with liquid dish soap and place the tip of the swab in the middle of the Petri dish.
8. Hold the tooth pick in place until finished observing.
9. Record observations.
10. Clean up according to teacher's instructions.

PRESENTATION

Have students prepare a lab report including the data, images, and video to give a presentation on the interactive white board or projector for the class. Refer to the video link on the website to see a demonstration of this lab.