



Curiosity Guide #206

Liquid Forces

Accompanies Curious Crew, Season 2, Episode 6 (#206)

Milky Mayhem

Investigation #7

Description

Investigate how whole milk and soap interact with each other.

Amazing!

Materials

- Shallow tray or a deep plate
- Whole milk
- Food coloring in various colors
- Liquid soap
- Pipette

Procedure

- 1) Pour whole milk into the pan so that the milk completely covers the bottom.
- 2) Drop several droplets of different colors of food coloring at different points around the pan.
- 3) Fill a pipette with liquid soap.
- 4) Drip soap droplets in the center of each of the colored spots and watch.
- 5) What do you notice?
- 6) Once the action stops, add a bit more soap to see if there is any more movement.

My Results

Explanation

Liquids can have other substances in them that cause interesting interactions between molecules. Although milk appears to be a liquid and is primarily water, it also has minerals and suspended fat, along with proteins. The soap is another liquid substance that has two parts. One part of the soap dissolves in water and breaks the cohesive attraction of the water molecules. The other part moves away from the milk and latches onto the fats and proteins.

As the soap and fat move away from the water, the movement mixes the food coloring into colorful swirl patterns and color combinations. The liquid will continue to move until the soap is blended throughout the water. By adding a bit more soap, you may get a little more action as the soap chases the fat and mixes the colors.

Something else to try: Watching the Milk Mayhem was pretty interesting. The soap freed and chased the fat particles and proteins from the milk and carried the food coloring along for the ride, making amazing patterns. You used whole milk in your investigation, but what would happen with 2% or skim milk? What about using water or a different liquid? Try it, and let us know what results you discover.

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