Solar Weather and Milk

Solar Weather: Observation and Art

This experiment is adapted from the Anne Marie Helmenstine post found at About.com.

Materials:

- A clean plate
- Milk (2% or whole)
- Food coloring- as many cool colors as you'd like!
- Dish detergent
- A cotton swab

The experiment:

1. Pour the milk into the plate. Make sure it covers the entire plate and that the plate is clean and dry.
2. Place a few drops of food coloring around the milk in different spots.
3. Dip the cotton swab in dish detergent.
4. Touch the milk with the dish detergent swab. You can place it at the center of the plate or see what happens when you put it in one side. You don't have to stir or move the swab at all.

Solar Weather and Milk

The chemistry behind the scenes:

Milk is a homogeneous mixture of many chemical substances, elements and compounds. Among these you will find proteins, which are natural compounds found in food and in your body; fats, which are also found in food and in the body and are generally soluble in organic compounds but not in water; calcium (Ca, element #20) and other cool milky stuff.

Dish detergents are chemicals designed specifically to clean your plate of food. They contain phosphates, which are compounds that have phosphorus and can dissolve calcium, and various enzymes that break down proteins and fats to smaller particles that can be easily washed away with water. Detergents also contain chemicals called surfactants, which lower the surface tension of a liquid and allow easier spreading.

When we add food coloring to the milk, nothing happens. BUT, when the dish detergent touches the milk, things start to move. The surfactants reduce surface tension, which allows the food coloring to spread around the milk. Then the enzymes start to react with the calcium, proteins and fats in the milk, which causes the color pigments from the food coloring to get pushed around, resulting in a cool colorful pattern.
So you see, it's not magic. It's chemistry!

Challenger® LEARNING CENTER HAMMOND, IN