Milk Mixture Mayhem

Simple STEM Activities You Can Do at Home

Purpose:	The purpose of this activity is for students to investigate and explain how the colors moved in cool ways.
Standard:	**S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.** a. Ask questions to describe and classify different objects according to their physical properties. **S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.** a. Plan and carry out investigations of physical changes by manipulating, separating and mixing dry and liquid materials. **S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.** a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.
Materials:	Disposable plate, bottles of food coloring at least 4 colors, milk, water, cotton balls or cotton swabs, dawn liquid soap or detergent.
Procedures:	1. **Observe** the milk, food coloring, and detergent. **Write** a list of words that **describe** it. 2. Pour enough milk in the plate to completely cover the bottom. 3. Add 1-2 drops of each color close together in the center of the plate. 4. Dip a Q-tip or cotton ball in detergent. Place the soapy end of it in the middle of the milk and **observe** what happens. 5. Try it several times with new milk, different patterns of food coloring, and different ways of adding the detergent. 6. **Explain** why you think the colors move when detergent was added.
Science Behind It:	Milk is mixture that includes several substances including water, vitamins, minerals, proteins, and tiny droplets of fat suspended in solution. Many of these molecules have positive and negative electric charges in different parts of their structure. When detergent is added to the milk mixture, the negative part of the detergent molecule lines up with the positive ends of the water molecules. This attraction causes the detergent molecules to move out quickly across the surface of the milk. Initially, there is lots of movement as the detergent and other molecules twist and turn around and different parts of the molecules come together. Along the way, the food coloring molecules are pushed and shoved in all directions interacting with other molecules and creating the colorful and unexpected show.
Questions to Ask:	1. What words can be used to describe the properties of the milk? 2. Explain why you think the mixture exploded with moving color like fireworks exploding in the sky?