

# Milk Moves

**Ages 3 – 10** Explore the colorful and random patterns formed by mixing three simple household ingredients.



**Activity Time:** 10 – 20 minutes

**Materials:**

- ¼ cup milk (approximate amount)
- shallow bowl
- food coloring
- 2 cotton swabs
- liquid dish soap

- 1** Cover the bottom of the shallow bowl with milk.
- 2** Add one to two drops of two or more colors of food coloring to the middle of the bowl.
- 3** Gently touch a clean cotton swab to the center of the bowl—don't stir! What do you observe happening?
- 4** Dip a new, clean cotton swab in the liquid dish soap. Then, touch this soapy cotton swab to the surface of the milk in the center of the bowl. What do you observe happening?
- 5** Continue to experiment with new colors, swirling them with the soapy cotton swab and making new patterns. Make sure to pour the soapy colored milk down the drain when you are done—don't drink it!

**Questions to Ask**

**Throughout the Experiment:**

- What differences did you observe when you used the clean cotton swab compared to the soapy cotton swab? Any ideas why the soap created that reaction in the bowl?
- What do you predict will happen if you use a different kind of milk, such as non-fat, 1%, or whole? What if you use a non-dairy milk like almond or soy?
- If you repeated this experiment, what do you predict will happen if you only use one color of food coloring? What might happen if you drop all of the colors on top of one another?
- If you were to repeat this experiment, what would you do differently? How could the color patterns inform your science exploration? How could the science exploration inform your color patterns?



Family STEM Activity

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## BACKGROUND

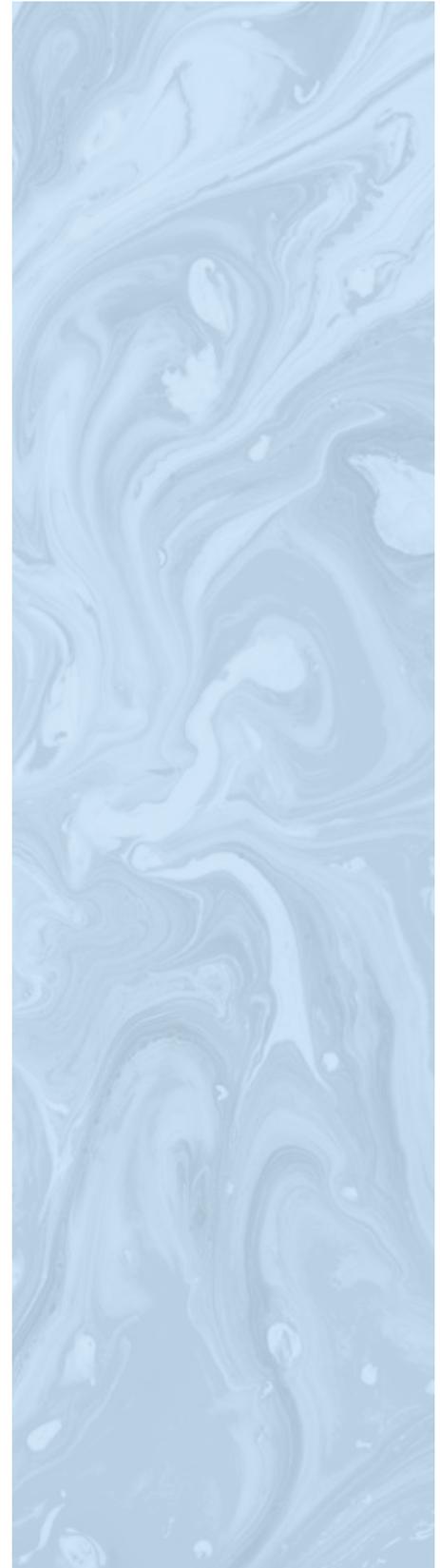
## FOR GROWN-UPS

### What's going on?

Milk is made up of water, protein, and fat molecules. Water molecules are polar, which means they have positive and negative parts. Since fat molecules are non-polar, they don't dissolve in the water. Soap has both polar and non-polar molecules, so when it's added to milk, the non-polar soap molecules connect to the non-polar fat molecules. As this chemical reaction takes place, it causes movement. We see the movement as the food coloring bounces around the bowl and creates beautiful patterns of color.



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