Marbled Milk Art

Here’s what you’ll need:

- Milk (any kind: cows milk, nut milk, soymilk, etc.)
- Liquid dish soap
- Food coloring
- Tray
- Q-tips
- Thick paper (preferably watercolor paper)

Directions:

1. Pour almond milk into a tray, just enough to cover the bottom.
2. Drop some food coloring around, 3 or 4 drops of each color.
3. Dip your q-tip in the soap and touch the colored milk with it, watch the colors start to expand and swirl.
4. Once you’ve swirled to your liking, you can ‘preserve’ your design by transferring it onto some paper. Stick a piece of watercolor paper on top and press down very gently. Lift and shake off excess lightly.
5. Flip quickly back over so design is right side up. Let the paper sit out to dry overnight.

See the art experiment in action:
[www.youtube.com/watch?v=SCbpEuhuoYg](http://www.youtube.com/watch?v=SCbpEuhuoYg)

Understanding the science:

Milk is mostly water, but it also contains vitamins, minerals, proteins, and tiny droplets of fat suspended in solution. Fats and proteins are sensitive to changes in the surrounding solution (the milk). The secret of the bursting colors is the chemistry of that tiny drop of soap. Dish soap, because of its bipolar characteristics (nonpolar on one end and polar on the other), weakens the chemical bonds that hold the proteins and fats in solution. The soap’s polar, or hydrophilic (water-loving), end dissolves in water, and its hydrophobic (water-fearing) end attaches to a fat globule in the milk. This is when the fun begins.

The molecules of fat bend, roll, twist, and contort in all directions as the soap molecules race around to join up with the fat molecules. During all of this fat molecule gymnastics, the food coloring molecules are bumped and shoved everywhere, providing an easy way to observe all the invisible activity. As the soap becomes evenly mixed with the milk, the action slows down and eventually stops.

Try adding another drop of soap to see if there’s any more movement. If so, you discovered there are still more fat molecules that haven’t found a partner at the big color dance. Add another drop of soap to start the process again.