



## Curiosity Guide #410

### Matter

Accompanies Curious Crew, Season 4, Episode 10 (#410)

#### Stone Milk

Investigation #3

#### Description

Is milk a solid? You decide!

#### Materials

- Sample solids, such as metal, wood, play-dough, a brick, a feather, a straw
- Nonfat milk
- Stove
- Pan
- Spoon
- Measuring cup
- Vinegar
- Tablespoon
- Food coloring
- Paper towels
- Wax paper
- Strainer
- Cookie cutter
- Cheese cloth

#### Procedure

1. Examine the different solid materials.
2. What are the characteristics of a solid?
3. Do you think milk can be a solid? Why or why not?

4. Measure, heat, and stir one-half cup of milk on the stove so that the milk simmers for several minutes without scorching. Foam will begin to appear on its top edges.
5. Keep the milk on the burner, but turn off the heat. Add one tablespoon of vinegar and stir. For every half cup of milk prepared, 1 tablespoon of vinegar is required.
6. Add desired food coloring and continue to stir to thoroughly mix the color.
7. Let the mixture begin to cool.
8. Pour the mixture into the strainer and drain out the liquid. This may need to be done several times, but avoid pressing the paste. The liquid can be discarded.
9. Place the paste onto half a paper towel, folding the towel over and blotting up more of the moisture.
10. Move the paste to a piece of wax paper.
11. Cut out different shapes with cookie cutters, leaving the mixture in each cookie cutter.
12. Cover the filled cookie cutters with cheese cloth or open weave linen to keep them clean.
13. Leave the covered items for 2 days.
14. Take the mixture out of the cookie cutters.
15. What do you think of stone milk?
16. Can milk be a solid? How is this possible?

## My Results

## Explanation

The vinegar causes the milk to separate into solid curds and liquid whey. Milk stone, or Galalith, was invented in 1897 by mistake when Wilhelm Kricheldorf discovered he could use the casein protein from cow's milk to make a tasteless, odorless, strong solid. The pre-plastic material was used for about 30 years to make different small accessories like jewelry, buttons, or decorations.

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