

On the Mooooove

The following activity uses the movement of color in milk to give some hints about what type of milk it is. At one point, the color moves pretty fast so don't let it get past-your-eyes!

Materials:

- Milk (skim, whole, and half & half)
- 3 shallow bowls
- Masking tape
- Pencil
- Liquid dish detergent
- Food coloring
- Cotton swab

Procedures:

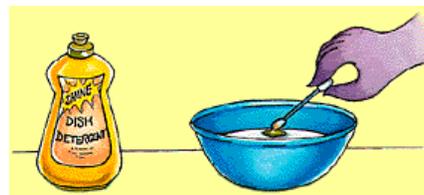
1. Place three bowls on the table and label them skim milk, whole milk, and half & half as shown. Add about 1/2 cup of skim milk, whole milk, and half & half to its labeled bowl. Look at the milks closely. What differences do you notice about them? What do you think might cause these differences?



2. Gently add one drop of food coloring to the center of the milk in each bowl. **DO NOT STIR OR DISTURB THE BOWLS.** What do you observe about the way the food coloring looks in each bowl? Does this observation make sense with what you observed about the milks before you put the food coloring in?



3. Dip a cotton swab in your detergent. Carefully touch the center of each food coloring drop in each bowl. Do not stir. Use a different cotton swab tip for each bowl. What do you observe? Do you notice a difference in the way the color looks in the different bowls? What do you think might cause these differences?



Think about this ...

Color was useful in telling the difference between the different kinds of milk. Do you think it could help you tell the difference between fresh water and salt water? Place about 1/2 cup of water in each of two separate clear plastic cups. Add about 1 tablespoon of salt to one of the cups and stir until no more salt will dissolve. Allow the water to sit for two or three minutes until it is still. Add one drop of food coloring to the center of the water in each cup. What do you observe? Does the color act differently in the two liquids? Could it help you tell them apart?

Where's the Chemistry?

The food coloring spreads out most in the skim, least in the half & half, and somewhere in between in the whole milk. Since milk is made mostly of water and fat, the food coloring looks different in the different milks because the food color mixes easily in water but not in fat. So the most mixing is in the skim milk which has the most water and the least fat. The least mixing is with the half & half which has the least water and the most fat. The food coloring moves differently in the three types of milk when the detergent is added. This also has to do with the way detergent acts in different mixtures of water and fat.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

