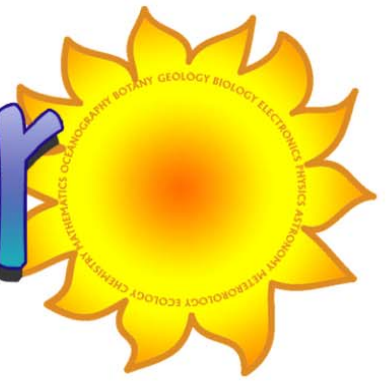


Science in the Summer



COLORS

See how fat affects the movement of colors.

MATERIALS NEEDED:

3 shallow bowls
masking tape
milk: skim, whole and half & half
liquid dish detergent
food coloring
3 cotton swabs

WHAT TO DO:

Pour about $\frac{1}{2}$ cup of skim milk into one bowl, $\frac{1}{2}$ cup of whole milk in the second bowl and $\frac{1}{2}$ cup half & half in the third bowl. Look at them to see if they look any different. The concentration of fat should give a visual difference.

Gently add one drop of food coloring to the center of each bowl of milk, being careful not to disturb the bowls in any way.

Dip each cotton swab into the dish detergent. Carefully touch the center of each food coloring droplet in each bowl. (Different swab for each bowl.) DO NOT STIR!

OBSERVATIONS:

Whole milk contains 4% butterfat. This fat forms a layer on the surface that prevents the coloring material from diffusing. When the detergent is added, it causes the film of fat to break up so that the coloring can now diffuse. Notice that the diffusion is toward the spot where the detergent was put. That is where the concentration of detergent is highest. Notice also that the several colors of dye do not diffuse at the same rate. That is due to the molecular structure of the coloring which determines how the electrons are distributed in the molecule. charges repel each other.

Now here is the surprise: When the colors get to where the detergent was put in, they *turn around!* The electric charges on the detergent molecules and the coloring molecules are apparently alike. Alike charges repel each other.