



Colored translucent materials such as colored glass have been used for centuries to make beautiful stained glass artwork. Glass makers use different chemicals in various combinations to produce the many different colors of glass for stained glass artwork. The combination of the design, the colors, and the effect of the light passing through the translucent material can create wonderful works of art. This activity uses glue instead of glass to create a work of art that you can hang in your window.

Materials

White, clear-drying glue
Food coloring
Water
Craft stick
Small plastic circular lid or styrofoam bowl
2 small plastic cups
Liquid dish detergent
Toothpicks
Measuring spoons

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SAFETY: Be sure to follow Milli's Safety Tips and do this

activity only with adult supervision! Do not drink any of the liquids used in this activity. Eye protection must be worn by everyone performing this activity.

Procedure

1. Place a small amount of liquid dish detergent in one small cup.
2. Place about 1 teaspoon of the glue in the other small plastic cup. Add about $\frac{1}{4}$ teaspoon of water. Mix with the craft stick.
3. Pour the glue and water mixture into the lid or small styrofoam bowl. Tilt the lid or bowl until the glue solution completely covers the bottom surface.
4. Place one drop of food coloring on the glue solution.
5. Repeat Step 4 two times, using a different color each time. Be certain to place the three drops in three different locations on the glue.
6. Dip the end of the toothpick into the detergent to obtain a small amount on the end of the toothpick.
7. Very quickly touch the center of each food coloring drop with the detergent on the end of the toothpick. Do not stir.
8. Observe the changes.
9. Thoroughly clean the work area and wash your hands.
10. Allow the glue to dry overnight. Remove the dried glue from the container. Hold your "stained glass" up to the light and enjoy!

Where's the Chemistry?

Food coloring is made from water and color molecules called pigments. The white glue also has water in it plus a chemical called polyvinyl acetate that is made of much longer and more flexible molecules than water is made of. The water molecules and the polyvinyl acetate molecules mix so much that the long flexible molecules of polyvinyl acetate move around like strands of spaghetti in a pot of boiling water. When the food coloring drops are added to the glue and water mixture, they can't spread out much because they are blocked by the combination of water and polyvinyl acetate molecules. When the detergent is added, the detergent molecules grab onto the pigment molecules and drag them along and the color spreads over the surface of the glue.

