

CHROMATOGRAPHY

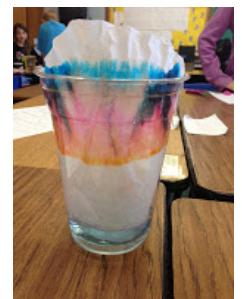
SCIENCE LAB

Chromatography is a process of separating out different parts of chemical mixtures onto an absorbent material that can then be individually analyzed because different parts are caught on the material at different rates.

For this experiment, you will be utilizing a chromatography technique to reveal the different color pigments used to create black ink!

MATERIALS

Black Crayola Marker
(Permanent Marker will not work)
White Coffee Filter
Cup
Water



DIRECTIONS

Start by drawing a thick line across the width of the coffee filter. Be sure to use a Crayola Washable Marker for this experiment! Add about an inch or two of water to the cup. Gently fold the coffee filter so that it will slide into the cup, and place it so it is just slightly touching the water. From here, observe what happens as the water is absorbed by the coffee filter and moves up to the black line. As the water continues to move, the different pigments are pulled out of the black to reveal the many chromatic layers of black ink!

SO WHAT IS GOING ON?

Why do some black inks separate into many colors on a wet coffee filter?

Most non-permanent markers use inks that are made of colored pigments and water. On a coffee filter, the water in the ink carries the pigment onto the paper. When the ink dries, the pigment remains on the paper.

When you dip the paper in water, the dried pigments dissolve. As the water travels up the paper, it carries the pigments along with it. Different colored pigments are carried along at different rates; some travel farther and faster than others. How fast each pigment travels depends on the size of the pigment molecule and on how strongly the pigment is attracted to the paper. Since the water carries the different pigments at different rates, the black ink separates to reveal all of the colors that were mixed to make it.

PROJECT EXTENSIONS!



Try this experiment with a variety of Crayola Marker colors and see which pigments are used to create the final color!



Create a beautiful bouquet of flowers! Start by drawing a thick ring in the center of the coffee filter, then fold in half and in half again. Place in the water and let the colors separate. Allow time to dry and then fold filter in half four times. Round off the top edge with scissors (this will create the flower shape) and pinch the bottom to create a little stem. Attach a pipe cleaner to make a long stem and then do the same with other coffee filters to create a whole bouquet!



Create butterflies using popsicle sticks, pipe cleaners, and googly eyes! Once the coffee filter dries, pinch the center to create the wings.