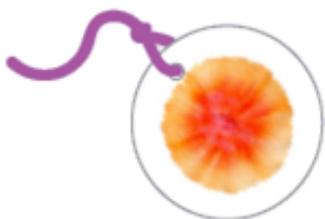


Paper Chromatography

Discover how scientists use color to study materials, and make your own colorful artwork!



Materials Needed:

Coffee filter or paper towel, washable markers, scissors, water, eyedropper or spray bottle, tray or towel. *Optional:* Hole punch, yarn.

Instructions:

Step 1: Cut a coffee filter or paper towel into sections. Choose two marker colors and draw a simple design. Make sure the markers are washable!

Hint: Choose one primary color (red, yellow, blue) and one secondary color (purple, green, orange).

Step 2: Place your drawing on a tray or towel. Use an eyedropper or spray bottle to drop water on your design. What happens to the ink as it mixes with the water and moves through the paper? How does your design change?

Step 3: Draw more designs! Experiment with different colors, patterns, and amounts of water.

Step 4: Hang up your artwork to dry. Once it's dry, you can make a hole in one edge and tie yarn through the hole to make an ornament or bookmark.



Challenge: Use a black marker to make a design. Add a few drops of water. Do you see any other colors? Black markers are made by mixing different colors together. Dropping water on the pigment separates those colors!

Colorful Chemistry: Chromatography

Paper chromatography is a method to separate the parts of a mixture. In this activity, water moves through the paper, separating the different color inks in each marker. The inks contain a number of different molecules, each with unique characteristics such as size and solubility (ability to dissolve). Because of their different properties, the water carries different color molecules at different speeds. For example, pigments in the orange ink separates out to show a range of yellows and reds.

Chemists use paper chromatography to separate and analyze the different parts of a mixture. Different chromatography methods use different materials. For example, scientists can make chromatograms of fall leaves to show how leaf pigments break down in cooler weather. In many tree species, green chlorophyll breaks down in the fall and the leaves change to red, yellow, or orange.

Right: Colorful tree leaves. *Image: Chris Glass, Wikimedia Commons.*



Scientists can use chromatography to identify unknown substances, by separating and analyzing the molecules that make them up. Chromatography is also used by law enforcement in crime scene investigations, by art experts to determine original paint pigments in restoration projects, and by artists to make colorful and beautiful artwork!



Left: Young scientists conduct a chromatography experiment.

Image: [NISEnet](#).

Right: Paper chromatography flowers. Image: [RedTedArt](#).

