

Chromatography

Chromatography is a method used by scientists for separating compounds so that they can be analyzed and studied. By analyzing a compound, a scientist can figure out what it is made of! Chromatography is a great physical method for observing mixtures and solvents, and can be demonstrated easily at home.

Rainbows for Science!

1. Flatten a coffee filter on an easy to clean surface.
2. Using a washable marker, draw a thick lined circle close to the middle of the filter. You can use one color – we recommend black– or create a few circles with different colors, leaving a wide space in between each ring. The space between rings is important for allowing the inks to spread and separate into their individual ingredients.
3. Coffee filters spread water easily through a process called *capillary action*, so you will only need a small cup of water.
4. Using a paintbrush, eyedropper, or teaspoon, add a small amount of water to the middle of the coffee filter. As the water moves through the paper it will spread through the color rings, causing the ink to separate into its individual components.
5. Let dry completely.

Materials

- Paper Coffee Filters
- Washable Markers
- Cup
- Water
- Paintbrush, Eyedropper, or Teaspoon



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What's Happening?

Chromatography is a laboratory technique for the separation of a mixture. The mixture (in this case, the ink from washable markers) is dissolved in a fluid (for this demonstration: water). The water here is called the mobile phase, because it carries the ink through the coffee filter, called the stationary phase. The components of the ink mixture will travel at different speeds, because some ingredients are heavier than others, causing them to separate!

Capillary Action is how the water travels through the coffee filter while carrying the ink. Capillary action is the ability of a liquid to flow in narrow spaces without the assistance of, or even in opposition to, external forces like gravity. Water molecules adhere to the cell walls of paper fibers more strongly than they stick even to other water molecules, causing the fluid to creep along the coffee filter!