

Chromatography: Chemistry Color Clues

Sometimes a scientist needs to figure out what is in a certain mixture of substances. One way they can do this is to use a process called **chromatography**. In the activity below, you can try chromatography to separate colors in a mixture of food coloring!

What you'll need

- Tray or double thickness of newspaper
- Green food coloring
- 2 Basket-style white coffee filters
- 4 Paper or plastic cups
- Measuring spoons
- 2 Cotton swabs
- Water
- Salt

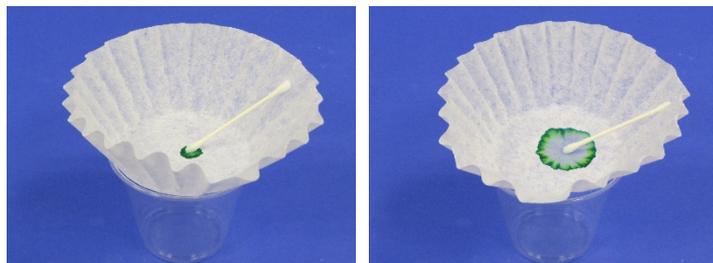
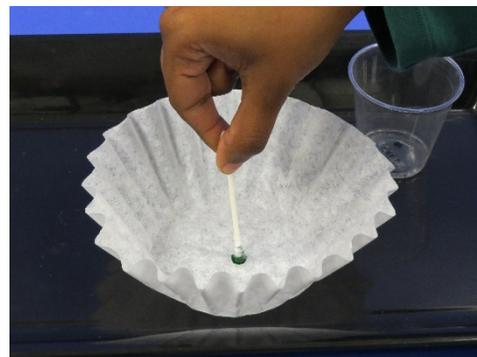


Be safe

Food coloring will stain skin and clothes. Always work with an adult to supervise and guide you.

Here's what to do

1. Place a coffee filter on a tray or newspaper.
2. In a small plastic cup, add 2 drops of green food coloring. Use a cotton swab to soak up the food coloring into one end of the swab.
3. Touch the end of the swab to the center of a coffee filter to make a dark green dot on the filter. Place the coffee filter on a cup so that the dot is over the center of the cup.
4. Dip another cotton swab in water and move it around so it gets thoroughly wet. Place the wet end of the swab in the center of the food coloring dot so that water can absorb into the coloring and the filter. Lay the swab down as shown.



After 3-4 minutes, if it looks like the color is not spreading much, re-dip the cotton swab into the water and put the wet end on the color again. As the water mixes with the food coloring and absorbs and moves through the filter, what do you notice?

What to expect

The color will spread out in a circle. If you look closely, you'll be able to see a thin circle of blue on the outside and a thin circle of yellow right next to it on the inside.



What's happening in there?

The reason why the colors separate has to do with the chemicals that make up the color, the water, and the paper. The chemicals that make up the color are called *pigments*. Some pigments attach to water better than others so they move further through the paper before sticking. The size, weight, and shape of the pigment also has something to do with how it moves along the filter paper and where it finally attaches. These factors usually cause enough separation that you can tell which colors were combined to make the original mixture.

What else could you try?

You could try using salt water instead of water to make the colors separate. Let's see if it separates the colors any differently than the water.

Be safe

Please review the safety instructions on page 1 before proceeding.

Here's what to do

1. Put a tablespoon of water in a small cup and add $\frac{1}{2}$ - teaspoon of salt. Swirl the cup until most or all of the salt dissolves.
2. Follow steps 1-3 above but when you get to step 4, use your salt water instead of water.

As you watch the salt water mix with the food coloring and move through the filter, what do you notice about the color? Are your results different than when you used water?

