

# Student guide: Food Dye Chromatography



## Overview and objective:

Students will analyze what colors make up the mystery food dye colors through the process of chromatography, which is a scientific technique that separates components of a mixture.



## Major concepts:

**Chromatography** is a process of separating or purifying mixtures of different substances. For example, food dyes are usually made up of range of different colors which can be separated using Chromatography. Different components of a mixture usually have different chemical properties, like molecule size or different abilities to dissolve in different kinds of solutions.

One important thing about chromatography is that there is some mixture in one state of matter, such as a gas or a liquid, (the **mobile phase**) moving over the surface or something else that is in another state of matter, such as a solid, that does not move (the **stationary phase**).

In this activity, the stationary phase is the filter paper, and the mobile phase is the salt water. The salt water is a solvent that will dissolve some of the colors from the food dyes.



## Safety guidelines:

Be careful with the food dyes. Gloves should be worn to prevent staining.



## Materials required:

- Filter paper and line drawn in pencil about an inch from bottom (optional hole punched at top)
- Food coloring (red, blue, yellow, mystery colors 1,2,3)
- Pipet tip for applying dye
- Salt water (5% salt in water)
- Reagent Reservoir/ Basin/ shallow dish
- Pencils for labeling filter paper



## Procedure:

1. Obtain a piece of filter paper and write name on top with pencil.
2. Cover the flat end of the pipet tip with your thumb. Put the tip into a tube of dye and use suction to get some dye in the tip.
3. Place the loaded tip onto the line drawn on the filter paper. Remove thumb from end and allow dye to leak onto the paper. Continue Step 3 until there is a spot for each of the colors including the mystery ones. Label each spot with pencil below the line.
4. Fill a basin or shallow dish with salt water to about  $\frac{3}{4}$  inch
5. Place the filter paper in the basin of salt water. Be sure that the paper is in the water, but the water level is below the location of the dye spots.
6. Observe the movement of the dyes across the paper.

