

# Student guide: Chromatography Butterflies



## Overview and objective:

Students will create multicolored butterflies with the process of chromatography, which is a scientific technique that separates the components of a mixture.



## Major concepts:

**Chromatography** is the process of separating or purifying mixtures of different substances. In this activity, we will separate the ink or pigments found in markers. Marker and pen inks are usually made up of many different colors. Different components in 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 coffee filter, and the mobile phase is the water. The water is a solvent that will dissolve some of the ink from the markers.



## Safety guidelines:

Be careful handling pipe cleaners. Safety glasses and gloves are recommended.



## Materials required:

- Looped name tag and pencil
- Pipe cleaners about 6" in length
- 2 large coffee filters per butterfly
- Paper plates
- Flip chart markers, multiple colors
- Water (spray bottles)
- Quart or gallon size Ziploc bag OR
- Drying line or drying area



## Procedure:

1. Use a looped tag and write your name on the tag with a pencil. Then, bend a pipe cleaner in half and loop the tag over the end. Set this aside.
2. Get a paper plate and lay 2 coffee filters on the plate. Stack so that they are aligned.
3. Draw on the filter paper with the flip chart markers. Black and Brown have the best effect.
4. Wait for an instructor to spray the coffee filters over the plate. Wait a couple minutes for the water to soak into the filters. What happens to the ink?
5. Separate the filters and hold vertically to let excess water drip or lay out on the table to start to dry. Continue to observe the colors change.
6. Loosely fold the filters in an accordion fashion and combine in the center.
7. Use the pipe cleaner (with the name tag) to join the two filters in the center. Twist the pipe cleaner ends together to hold the filter and make two antennae from the loose ends.
8. Expand the filters outwards to create wings.
9. Hang the butterfly from the antenna on a line to dry. If not dry by the end of the event, place the butterfly in a quart or gallon size Ziploc bag.

