

## A Fair Flower Bouquet: EXPLORING CHROMATOGRAPHY

Art Form: Visual Arts • Other: Science

### DESCRIPTION:

In this science experiment, you'll be exploring **chromatography** (*the separation of a mixture*). Using coffee filters to separate the various pigments in markers, you will investigate how each color was created! Then, we'll use the results to create a beautiful flower bouquet!

### RECOMMENDED AGE(S):

K through 5th grade

### TIME TO COMPLETE:

Approximately 30 minutes

### MATERIALS NEEDED:

- ▶ Coffee Filters
- ▶ Washable markers in black and assorted colors (*Do not use permanent makers – your chromatography experiment will not work*)
- ▶ Water
- ▶ Small cups
- ▶ Scissors
- ▶ Green pipe cleaners (*chenille stems*)
- ▶ Brown kraft paper



### WHAT YOU DO:

#### ADDING COLOR

1. Using a black marker, draw and color a thick ring around the center of the coffee filter where the ridged part meets the flat center.
2. Fold the coffee filter in half and then in half again, resulting in a cone shape.
3. Fill a cup with water about 1 inch deep.
4. Pull apart the cone shaped coffee filter so it balances around the rim of the cup while the tip of the cone should touch the water. (*Be sure not to let the ring of marker ink dip into the water. Only the uncolored tip of the coffee filter cone should have contact with the water.*)
5. Let the filter sit dipped in the water and watch what happens as the water begins to flow up the paper.
6. After the water has reached the outer edge of the coffee filter, place it on a newspaper or paper towel to dry.
7. Once the coffee filter is dry, take a look at the results! Is the black ring you drew still just black? (*Black ink is actually composed of a rainbow of colors!*)
8. Experiment with different colored markers, repeating the steps above with a fresh coffee filter.
9. Observe how some colors are separated into several colors, while others are spread out but stay as a single color.
10. Once all your coffee filters are dry, you are ready to create your floral bouquet!

#### MAKING THE FLOWERS

1. To make coffee filter flowers, choose two filters with colors that you think complement each other.
2. Stack the two filters together and fold them in half.
3. Fold in half two more times. (*Tip: Try cutting a rounded petal shape across the wide edge of the folded coffee filters to create uniquely shaped flowers.*)
4. Now, fold the two outer flaps outward onto themselves so that you have a zig-zag shape.
5. Pinch and twist the tip of the filters together a bit and place the end of a pipe cleaner about half an inch from the bottom point.
6. Tightly wrap the pipe cleaner around the coffee filters, spiraling down until it covers the bottom point. Leave the rest of the pipe cleaner straight as the stem.
7. Gently separate each layer and pull it outward, shaping them to form a flower.
8. One coffee filter flower is now complete! Repeat the steps above to make a whole bouquet!



## TYING IT ALL TOGETHER

1. Cut a sheet of brown kraft paper into a large square and lay it diagonally on a flat surface.
2. Place the bouquet on the paper square, with the tops of the flowers laying on the top corner.
3. To wrap your flowers, first take the bottom right corner and roll it over once or twice, depending on how large your bouquet is.
4. Wrap the left side of the kraft paper over the bouquet, then the bottom section, then end with the right section (in that order).
5. Take a piece of string, yarn, or ribbon and tie it around to finish off your wrapped bouquet.

## SCIENCE KNOWLEDGE!

In the coffee filter colored by the black marker, you should be able to see the rainbow colors after the black ink has spread out.

Since washable ink can dissolve in water, it starts to travel up the paper with the water.

There are several components inside the black ink.

When these components are spread out, you can see that the black ink is actually composed of a rainbow of colors.

The same thing happens with other colors, but you will notice that the primary colors (red, blue and yellow), do not spread out into different colors, while others do. For example, green will be separated into blue and yellow, and orange into red and yellow, etc.

## HOW YOU CAN SHARE:

Be sure to take a picture of your floral creation and share it via our Facebook page, **Van Wezel Education & Community Engagement** and remember to tag it, **#artworksanywhere**.

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