

Group # \_\_\_\_\_

Name \_\_\_\_\_

Period \_\_\_ Date \_\_\_/\_\_\_/\_\_\_

# Lab Ch 3 • Chromatography of Markers & M&Ms

Lab Partners: \_\_\_\_\_

## Introduction

Reproduce beautiful, multicolor art patterns using paper chromatography! Various color pigments that make up inks in pens and markers can be separated using chromatography. The inks are spotted onto a filter-paper circle containing a paper “wick” in the center, and the wick is placed into a cup of water. As water seeps outward through the paper, the different color pigments in the ink mixtures separate out in a circular or radial pattern, producing a multicolor artistic effect.

## Objective

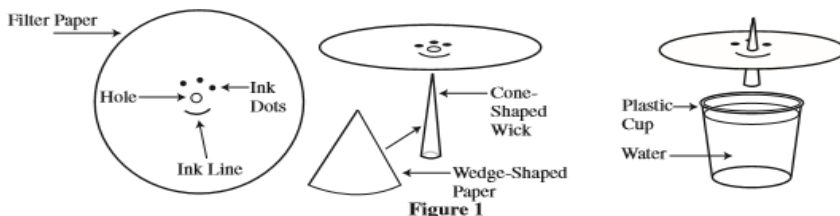
**The purpose of paper chromatography is to separate a mixture into its various components.** Using a sample that is a mixture of several highly colored components, such as ink or dyes, allows the scientist to see the components as they separate.

## Materials for Marker Chromatography

| Chemical                                     | Equipment                  |
|--|----------------------------|
| 2 Markers (water soluble)<br>Black and green | (2) 150mL or 250mL Beakers |
| Tap water                                    | Pencil                     |
| M&Ms   | Filter Paper               |
|  | Scissors                   |
|  | Petri dish                 |

## Lab

### Illustrations for Markers



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### **Part 1: Procedures for Markers**

1. Obtain a piece of filter paper. Using a sharp pencil (NOT PEN), poke a small hole in the center of the filter paper.
2. With a black (water soluble) marker, place a small but concentrated spot of ink from marker about 1cm from the center hole onto the filter paper. The “spot” may be a dot, a wedge, a short-line, an arc, etc. See figure 1 above for example.
3. Grab a piece of “cut” pie-shaped filter paper.
4. Roll up a filter paper wedge into a tight cone and insert the cone-shaped “wick” into the hole in the center of the filter paper.
5. Set the prepared filter paper circle on top of the water-filled cup.
6. IMPORTANT.... The “wick” needs to BARELY touch the water in the beaker. So you may have to dump or add water into the beaker.
7. The teacher will demonstrate this to you. See lab illustration above.
8. **When the water has advanced to within 1-2 cm of the outer edge of the filter paper, carefully lift the chromatogram and set it on a paper towel to dry.**
9. Repeat this process with a green marker using a new piece of filter paper. You can design a different pattern “Spots/lines”.
10. **Observation/Data Table: (Leave about half a page space to put both your filter papers here)**

### **Part 2: M&Ms Color Mix**

1. Fill the bigger petri dish with enough water just to cover the bottom.
2. Drop a Skittle of different color along each side so that they are across from each other and evenly spaced.
3. Wait and observe.

### **Disposal/Clean Up**

- M&Ms, solids and filter paper go in the **trash**
- Clean ALL equipment with LAB Equipment soap & brushes
- Leave dishes to dry inverted on a paper towel.
- Clean Lab BENCH with small soap bottle and sponge.
- Wash hands with hand soap.
- Let me know when you are ready. **Do not get unprotected until dismissed.**

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### Data table: Part 1

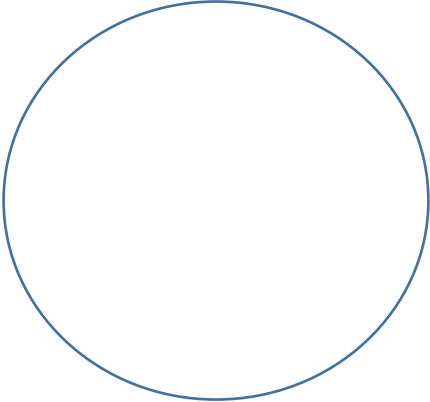
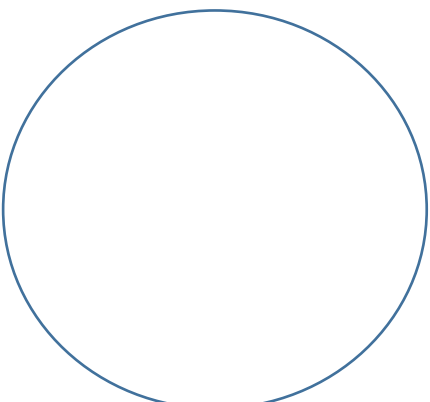
Cut the filter papers in half so each partner has a half for their data. Staple filter papers to lab. (MAKE SURE THEY ARE DRY FIRST!!!)

| Black Marker | Green Marker |
|--------------|--------------|
|              |              |

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### Data table: Part 2

Draw & Color the Before and After M&Ms mix.

| Before Colors Mix   | After Colors Mix   |
|---|--|
|  |  |

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## **Lab Ch 3 • Chromatography of Markers & M&Ms**

### **Post-lab Questions**

- 1. Do all the colors move the same distance? Is there one color that traveled further on the filter paper compared to other colors?**
- 2. What real world application could this technique of chromatography have? You must name at least one application and explain how chromatography could be used.**
- 3. What did you notice about the color mixing of the M&Ms? Did they mix evenly or did one color dominant over the others?**
- 4. What type of mixture is the color dyes from the M&Ms: Homogeneous or Heterogeneous (Circle your choice)**
- 5. If you had time to experiment with other candies, can you name 2 candies that have dyes in them?**
- 6. We discussed temperature has an effect on Matter. If you tested the candies with different temperatures of water, what would happen to the dissolving rate in cold water vs hot?**