PAPER CHROMATOGRAPHY Part 1

How to separate the pigments in a leaf or even a marker

**Introduction:** A pigment is a molecule that absorbs light and reflects back only 1 colour. You see the reflected colour. In a leaf the pigment is called chlorophyll, it absorbs all colours except yellow and green. You see a green leaf. There are other pigments in the leaf that only show in the fall.

Xanthophyll = yellow Anthocyanin = red Carotene = orange

To separate these and the colours in your marker we put them in solution, then dip the tip of a piece of paper towel in the liquid. The colours race up the paper towel and the smallest colours get to the top first.

**Purpose:** to figure out how many colours are in your marker? What their sizes are.

**Hypothesis:** if we race the colours to the top of the paper towel, the colours will separate with the smallest at the top and the biggest at the bottom.

**Materials:** strip of paper towel 10cm long, a water soluble marker (green, black, brown, grey, purple work best), 2 pencils, a glass, and a little bit of water.

**Procedure:**

* Place a medium sized dot of colour 3cm from the bottom of the paper towel
* Wrap the top of the paper around the pencil so that the paper just barely touches the bottom
* Put1-2cm of water in the glass
* Balance the pencil across the top so the paper hangs into the water.
* Observe the colours separate (5min.)
* Draw a picture of the final colours

**Data: final colours after 5 min (you draw your colours here)**

**Analysis:**

1. How many different pigments were in your ink?
2. Which colour was the smallest? Explain how you know.
3. Which colour was the largest? Explain how you know.

Paper Chromatography part 2

**Purpose:** to figure out how many colours are in your spinach leaf? What their sizes are.

**Hypothesis:** if we race the leaf pigments to the top of the paper towel, the colours will separate with the smallest at the top and the biggest at the bottom.

**Materials:** strip of paper towel 10cm long, mortar and pestle, sand, alcohol, spinach leaf, paper clip, beaker, waste bucket.

**Procedure:**

* Place a small amount of sand and
* 10ml of alcohol in a mortar and pestle
* Place your spinach leaves in the mortar and pestle
* Grind them till all the alcohol looks green. (check with teacher to be sure)
* Filter the green liquid into a flask
* Place a paperclip through the end of the paper **put** **your initials in pencil on the top**
* Balance it so the tip of the paper is in the green liquid
* Wait about 5 min.
* pin it to the board to dry
* clean up

**Results**: final colours under the ultraviolet light **(you draw your colours here)**

**Conclusion:**

1. How many different pigments were in your spinach leaf?
2. Which colour was the smallest? Explain how you know.
3. Which colour was the largest? Explain how you know.