Spinach Leaf Chromatography

Name: _____
Date: _____
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Objective: _____
_____
_____

Question: How does chromatography show us the true colors of plants that undergo photosynthesis?

Hypothesis: What do you think will happen to the "plant liquids" when placed into rubbing alcohol?
_____
_____

Materials:

- Filter paper
- Petri dish
- Rubbing alcohol
- 1 coin
- Pencil (DO NOT USE A PEN!)
- Ruler
- Spinach and Red Cabbage Leaves
- M&M
- Marker

Procedure:

1. You will be working with the people at your table. Gather all supplies
2. Get a piece of chromatography paper. Cut the chromatography paper into 4 similar sections.
3. Using a pencil a ruler, draw a pencil line across each section of the chromatography paper 2 cm from the end of the chromatography paper.
4. On the pencil line of one of the sections, make a mark with a marker
5. On the pencil line of another section, mark the dye of an M&M on the line (wet the M&M)
6. Using a coin, try to extract "plant juice" from the spinach leaf and a cabbage leaf. Make sure to smear the liquid on the line of filter paper.
7. Let the "plant juice" dry for a couple of minutes on the filter paper.
8. Place the chromatography paper with "plant juice" marks into the petri dish containing the rubbing alcohol.
9. Wait five to ten minutes for this process to take place. Place the strips on a piece of paper towel
10. Measure how far each band traveled in centimeters.
11. Write the measurements and the colors of the bands in the chart
12. Identify the pigment each band could represent and fill it in the chart.

Pre-Lab Questions: Answer the following questions before starting the experiment.

1. Why is energy required for life?

2. How does energy enter the living world?

3. Why do plants have green leaves?

4. What is chlorophyll and how does it help with photosynthesis?

Data and Observations:

Dye Item	Distance Band Traveled (cm)	Band Color(s)	Identity
Marker			
M&M			
Spinach			
Red Cabbage			

Draw what your chromatography paper looks like for each dye item

Marker	M&M	Spinach	Red Cabbage

Pigments: reflect this

- *Chlorophyll a – blue-green color*
- *Chlorophyll b – olive green*
- *Xanthophyll – yellow*
- *Carotene – orange yellow*
- *Anthocyanin – purple, blue, and/or red*

Analysis and Discussion: Answer the following questions after the experiment.

1. Describe the data collected in the experiment.

2. Why is chlorophyll green?

3. During the fall, leaves change colors as the temperature decreases and the days get shorter. Why do leaves change color in the fall?

4. How could you predict the color a leaf will change during the fall?