Minds in Motion

Curious Fall Chromatography

What's The Plan?

Fall is such a magical, colorful time. One of the coolest places we see colors in fall is in the leaves of trees, as they slowly turn from green, to yellow, orange and red. But have you ever wondered how leaves change colors through the fall, and what decides if the leaves will become yellow, orange or red? Using chromatography, you can answer these questions and practice a laboratory technique used by scientists all over the world!

What You'll Need:

Here's a list of everything you'll need! Don't have something exactly? Get creative! Some of our suggested swaps are listed in Grey.

- Fresh Leaves- try to find at least 3 different types of leaves, and 5 of each of the diffe rent types
- Isopropyl/ Rubbing Alcohol
- Coffee Filters | Paper Towel
- Water

- 1 glass cup per type of leaf- if you found 3 different types of leaves, you will need 3 glass cups
- A glass container or pan that all the glasses will fit into
- Scissors
- A Spoon
- A kettle or pot to boil water

What To Do:

1. Go for a walk outside and look for leaves! Try to find at least 3 different types of leaves, and 5 of each type.
2. Use your scissors to finely chop the leaves. Try to get the pieces as small as possible, since this will release the most pigment for the chromatography experiment. Do not mix the different types of leaves up with one another.
3. Put each type of leaf into a separate glass cup. Fill each cup up with enough rubbing alcohol to cover the leaves.
4. Use your spoon to mix the leaves up into the rubbing alcohol and color the alcohol with the leaves. You can use the back of the spoon to squish the leaves against the side of the cup to get as much color out of them as possible.
5. With the help of an adult, place all of your cups into the larger container, and pour boiling water into the glass container around the cups. Continue stirring the leaves until the alcohol seems to have fully taken on their color.
6. Take a coffee filter and cut a strip off of it. Place one end of the strip inside of the liquid in the cup, and leave the other end hanging out of the cup.

7. Be patient and watch the color from the alcohol transfer up your coffee filter and stain it. Once it seems like the liquid has stopped travelling up, you can remove the coffee filters and examine them!
8. Now that you have your chromatography strips, read ahead to the "Why Did We Do It?" to understand how to interpret the colors!

Why Did We Do It?

Here is a list of important words we use during the project!

Pigment- a molecule produced by a leaf that helps give it its color.

Leaves have 4 types of pigments:

Anthocyanins- give leaves a RED color

Carotenoids- give leaves an ORANGE color

Xanthophyll- give leaves a YELLOW color

Chlorophyll- give leaves a GREEN color

When leaves turn from green to yellow, orange and red in the fall, it's because the amounts of these different pigments are changing. In the spring and summer, chlorophyll is high and the leaf looks green, but in the fall the levels of chlorophyll decrease so the leaf begins to look yellow, orange and red.

Chromatography- a technique scientists use to separate different pigments. Chromatography can show us how much of each type of pigment is within specific leaves. Chromatography is based off of the size of pigments- ***the smaller a pigment is, the farther it can travel up the coffee filter.***

Hi Scientist! Can you help me answer a question? I'm wondering which of the 4 leaf pigments is the largest and which is the smallest. Can you use your coffee filter strips to help me answer my question?

How Did It Go?

We'd love to hear about all the amazing STEM projects you're doing! Show us your finished projects on any of the following social media platforms by tagging us!

Twitter: @MyMindsInMotion
Facebook: @mindsinmotion2014 || @ucactiveliving
Instagram: @ucalgaryactive

SCAN ME

Let us know how you felt about the project! Please click here or scan the QR code above to fill out a short survey!