

Chromatography!

PURPOSE:

- To learn about the concept of cohesion and adhesion
- To learn real life applications of the above concepts through chromatography

TALKING POINTS:

- Water is made up of lots of tiny molecules. On a single water molecule, there are slight positive and negative charges that cause attraction between the water molecules. This is called cohesion. An example of cohesion could be water collecting in drops on leaves after it rains. The water molecules like to stick together, so they pool in little droplets
 - Can you think of any other examples of cohesion?
- Water likes to stick to itself, but it also likes to stick to other surfaces. This force, between two different types of molecules, in this case water and something else, is called adhesion. This force can often oppose gravity.
 - Can you think of any examples of adhesion?
- The last force we will be talking about is capillary action. This is a combination of the two forces we've already discussed → adhesion and cohesion. Capillary action can be seen mostly when water travels through tube-like shapes. The water is attracted to the sides of the tube and this allows the water to travel upwards against gravity. This is how trees transport water from their roots up to the leaves.
 - Can you think of any other examples of capillary action?
- We will be observing these forces in action today!

MATERIALS:

- Cups
- Markers
- Coffee Filters
- Tape
- Pipe Cleaners
- Popsicle sticks
- String
- Clothespins

PROCEDURE:

1. Draw a design on the coffee filter. It is better to keep your design towards the center of the filter and darker colors (like black) will work better as they contain many different pigments.
2. Fill a cup to a centimeter or two of water, you don't want too much, or else the coffee filter will get soaked!
3. Bunch the filters into a cone-like shape and place the bottom corner into the water.
4. Wait for 5-10 minutes for the water to travel up through the filter.
5. Take the coffee filter out of the water.
6. Pat the filter with a paper towel if still wet.
7. Decorate with string, pipe cleaners, clothespins, popsicle sticks, glue, and markers!



CONCLUDING QUESTIONS:

1. What happened in the experiment?
 - a. What did you observe? Why do you think this happened?
2. Why did the rest of the coffee filter get wet?
 - a. The rest of the coffee filter got wet as a result of cohesion and adhesion forces.
3. Why did the colors spread out in the coffee filter?
 - a. Some of the colors are made up of smaller molecules so they can travel through the water faster. This is why the colors all separate out when they travel through the water.