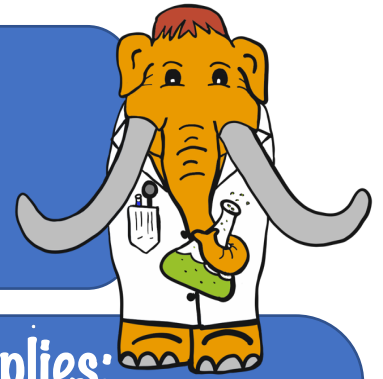


Science Saturday @ Home

Coffee Filter Chromatography



Gathering Supplies:

- Coffee Filters
- Black Jelly Beans
- Black Markers
- Toothpicks
- Paperclips
- 3 Jars
- Plate
- Scissors
- Water

How To Steps: Let's use coffee filters and coffee filter chromatography to see what colors make up black jelly beans and black markers.

What colors make up a black licorice flavored jelly bean?

1. Use the coffee filter and cut out two circles.
2. Have an adult cut your jelly bean in half. Soak the two halves in water for about 5 to 10 seconds to help dissolve the jelly bean's wax covering.
3. Place each half into the center of each coffee filter circle. Check back every few minutes to see what colors you can see on the filter.

Black ink is a mix of different colors. Do all black markers use the same mix of ink colors?

1. Cut strips of coffee filter. Fill 2 to 3 small cups or jars with just a little bit of water.
2. Find different types of black markers. They need to be washable or water soluble to work for this experiment.
3. Color in a circle at the bottom the strip of paper. Use a different marker for each strip.
4. Paperclip the filter to the toothpick and place the filter into the glass. The end of the filter with the black circle should be able to just barely touch the water in the bottom of the glass.
5. Watch as the water is pulled up the filter. What happens to the ink?

Max's Coffee Filter Chromatography Experiments



Jelly Bean



Black Markers

Did You Know?

How does the coffee filter pull the water out or up against gravity? This is thanks to something called capillary action.

Capillary action is the flow of liquid, against gravity, up a narrow tube or porous surface. Capillary action is also called wicking. Examples of capillary action can be seen when you lay a paper towel with its corner on a spill, and it is how a plant pulls water through its roots and up to the flower.

How does capillary action work? Tiny molecules in the liquid are attracted to the molecules in the material, this is called adhesive force. At the same time the tiny molecules in the liquid are attracted to each other forming a bond, this is called cohesion. Cohesion is what creates surface tension. This is why a water droplet is round. Together the cohesion of the liquid and the adhesive force pulls the liquid up the narrow tube against the force of gravity.

With coffee filters the long cellulose fibers that make up the paper, attract water molecules. The mesh of the filter has tiny air pockets that pull the water molecules into them. As the water moves through the filter it pulls the food dye or ink molecules into the filter. Molecules that are heavier will not travel as far as the lighter molecules. This causes colors to separate from each other.