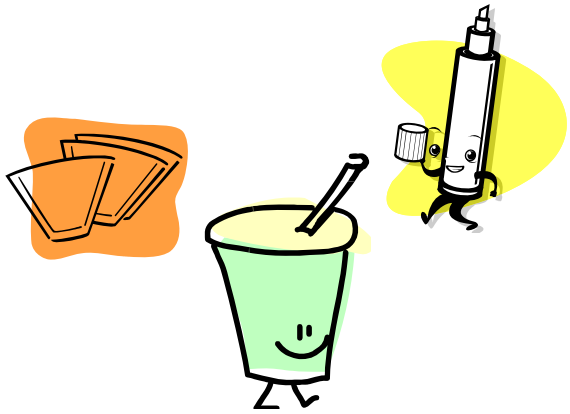
Is black really black? . . .

The Challenge:

Is **black** really **black**? Use physics and chemistry to solve this mystery!



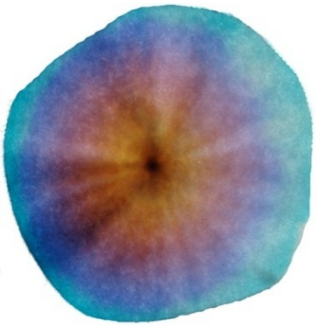
Materials Needed:

- Water soluble markers in a variety of colours
- 1% salt water solution (0.5 ml salt in 750 ml water)
- Coffee filter paper, cut into a 10 cm diameter circle
- 5 cm length of pipe cleaner
- Small plastic cup

Method:

1. Use the markers to place a large dot in the centre of the filter paper. Create additional designs on the paper as desired making sure to leave white spaces between.
2. Fill the glass with the salt solution, leaving 2.5 cm at the top.
3. Carefully push the piece of pipe cleaner into the centre of the filter paper where you have placed the centre dot.
4. Place the filter paper on the top of the cup so that the pipe cleaner is suspended in the salt solution. Try not to get the filter paper wet.
5. Watch what happens as the salt solution moves up the pipe cleaner and across the filter paper.
6. Stop the experiment when the salt solution is about 1 cm from the edge of the paper. Allow the paper to dry flat. You may wish to create a flower using the pipe cleaner as the stem!

How does this work:



Colours are often made from more than one dye. We are able to separate the dyes using a technique called chromatography. Dyes that dissolve in water (water soluble) are able to move across the fibres of the paper by capillary action. Some dyes have more affinity for the salt solution and will travel further across the paper. As you experiment, you will discover the bands of colour and a literal "rainbow" hiding in each dot.

Variations:

- Try this experiment with powdered drink mixes or food colouring
- Compare the same colour of different brands of coloured candies. Wet each candy and rub on the filter paper to deposit some of the dye
- Using the same colour of multiple brands of water soluble markers and chromatography, determine which brand of marker was used at a "crime scene"