

Activity: Chromatography

On SCOPE's Colours episode, you saw Julia separate out the colours of a black marker using chromatography. Here's how she did it:



What you need

Black Marker
Coffee Filter Paper
Stapler
Pencils
Jar
Water

What to do

1. Cut the filter paper into strips.
2. Make a loop at the top of a strip by folding down about 5cm of the paper and stapling it in place.
3. Thread the pencil through the loop.
4. Draw a black line about a finger width from the bottom of the paper.
5. Pour some water into the jar.
6. Place the pencil on top of the jar so the paper is hanging inside the jar. It is important that the paper touches the water but the black line sits above the water line. So do it slowly, as you might need to take some water out, or add some more water to the jar!
7. Wait and watch what happens.
8. Try the experiment with different types of markers and see how they compare!

What's happening?

Water starts moving up the paper, against gravity, because of forces between the paper and the water molecules, and between the individual water molecules. As the water moves, the molecules of colour are carried with it. A cool rainbow effect is made because each colour has a different chemical nature. Some colours: like the blue, are heavier or more attracted to the paper, so they don't move very far, but other colours: like the orange and yellow, are lighter and are more attracted to the water, so they race up to the top of the paper.

But remember this doesn't work with every pen! That is because some pens are not water soluble- or they don't dissolve in water. So you need a different solution like methylated spirits to break up the colour water molecules in the ink.