

Coffee Filter Butterflies and chromatography

Materials per butterfly

- Coffee filters
- Pipe cleaner
- Wooden peg
- 2 x googly eyes
- Glue (glue gun)
- Clear jar/glass with water
- Washable markers



Method:

1. Filter paper – draw a horizontal line of one colour about 1.5 cm from the base of each filter paper. Turn the paper over and do the same on the other side.
2. Put a small amount of water in the jar – a couple of mm is fine
3. Fold your paper so it will fit into the jar and carefully place in the jar with the bottom edge or point just touching the water.
4. Hold it there and watch!
5. Very soon you should start to see some colour changes and you may be surprised at the colours that emerge.
6. When the ink has stopped moving up, take the paper out and spread it out to dry.

Create your butterfly

- When your coffee filter wings are dry bunch them slightly in the middle.
- Bend your pipe cleaner in half then wrap around your filter to secure butterflies' wings together.
- Bend the pipe cleaner ends to create antennae.
- Use the wooden peg to secure and create butterfly body.
- Secure googly eyes to end of peg.

Tips for success:

The 1.5 cm gap between the base of the paper and the colour is important. This allows the water to draw up through the paper before the ink starts to dissolve and the water carries the ink upwards

Make sure the tip at the base just touches the water so you don't flood it – for the same reason as above – you want the water to travel up to meet the ink.

The Science Bit or What's Really Happening Here?

Chromatography is used to separate out components in substances. This experiment with colour is a simple, visual way to demonstrate this process.

The water travels up through the paper by capillary action.
As the ink dissolves, the colours separate.

Different colours have a different molecular structure. Those colours with a higher electrical charge will travel further so bands of different colours will appear.

An easy way to explain to children is to think of it as a race. The colours start off in a line, all bunched together, but as the solvent reaches the band of colour they separate and move differently.

Some colours are more attracted to the paper, while some are more attracted to the water so move further.

Also, colours made up of smaller molecules tend to move further away.