

Chapter 4: Light and colour

Chromatography: colour splitting

Ratings

MESS  DANGER  DIFFICULTY 

Theme

Parts making up the whole

Equipment needed

Coffee filter paper, preferably white; glasses of water; either a collection of coloured felt-tip pens or brightly coloured sweets, e.g. Skittles or Smarties

Before you begin

This is an experiment that can take a long time to work so is a good candidate for starting at the beginning of your Messy Church session and returning to later.

The colours we see are often very carefully created. Pick up some paint charts from the local DIY store, and see that a paint cannot just be blue, but must be 'moonlit lagoon'. You could ask people whether they have a favourite colour. But more interesting would be if they are fussy: do they like all reds or just that particular shade between burgundy and claret?

This experiment has been run as part of a forensic analysis activity, in which a message is written, and people are challenged to work out with which pen it was written.

Experimental method

If using sweets: Cut a disc of filter paper, which sits on top of the glass with a tab that drops down into the water (see photos online). Place the sweet at the top of the tab and wait for the water to soak up the paper.

If using pens: Cut long thin strips of filter paper. Using felt-tip pens, colour a line about a quarter of the way up the strip and suspend it with the bottom of the paper (but not the pen mark) in the water (see photos online). Wait for the water to soak up the paper.

This will take around 5–10 minutes. Be careful not to leave it for too long or the colours cannot be separately identified. In both cases, the colour will be dissolved into the water, but the different colourings within the dyes will separate out and be transported different distances. Note how many different colours make up the original colour.

Big thinking

Science has developed many different techniques to determine what a substance is made from. It is particularly important in police forensics to know that paint is made up from different individual dyes. A paint sample left at the scene of a crime can tell them the exact make and model of car used for the getaway. Every paint mix has its own unique chemical 'fingerprint'.

This experiment works because the different molecules of the different dyes mixed to make the original colour are different sizes. The difference in size means that they are carried different distances by the water.

Big questions

Who makes up the unique mix that is your Messy Church? Can you identify each person's contribution – big or small? The Bible has a lot to say about being the people of God but perhaps think about what Paul says in his letter to the Corinthians about the church being the body of Christ (1 Corinthians 12:12–31).