

SCIENCE learning springboards

Pappus

Living things and their habitats: leaf chromatography

What colours are in Autumn leaves? Experiment and create scientific art

Aim: To be able to give reasons for classifying plants based on specific characteristics, and to understand and describe the process of chromatography. Note: this will still work in Spring or Summer, as different species of green leaves will yield different colours on filter paper.

This fun experiment will provoke good discussion about photosynthesis and the colour of plants.

- Chlorophyll (green)
- Xanthophyll (yellow)
- Carotenoids (orange)
- Anthocyanins (red/purple)

Chromatography is the process that separates these colours out.

Activity: What colours are in leaves?

You'll need to collect a range of leaves from different species and with different colours.

There are many examples of 'How Tos' on the internet but this is the outline of the activity.

- Keep each species of leaves separate.
- Cut or tear or grind in a pestle and mortar until only small pieces of leaf are left. Place them in a beaker or glass.
- Add enough rubbing alcohol or surgical spirit to cover the leaf pieces and then cover the pot with clear cling wrap to stop evaporation.
- Put the pot in a tray of hot water for 30 minutes. The alcohol turns coloured as the pigment from the leaves is drawn into it.
- Cut a filter paper strip 15mm wide, tape it to a pencil and suspend the pencil across the beaker with the end of the strip touching the alcohol pigment mix.
- Over 30 - 90 minutes the pigments will slowly travel up the filter paper and begin to separate.

Chromatography is used in forensic policing. Pupils could plan and carry out an investigation to discover which pen wrote an incriminating note, for example.



Resources:

- You need a range of leaves of different colours so it's best to do this in **early autumn** when the leaves start to change colour. Try to include maples in the leaf mix as they are likely to have the best range of colours
- Rubbing alcohol or surgical spirit
- Glass jars/beakers
- Wooden spoons or a pestle and mortar or scissors
- Paper filter
- Visit the leaf chromatography page on the website *From Playdough to Plato*

Success criteria: pupils can:

- ✓ describe how to separate pigments in a leaf
- ✓ explain the pigments they see in their filter paper
- ✓ group plans according to similarities and differences in pigmentation.

Key vocabulary:

pigment, forensic science, chromatography



Chromatography forensic science



Leaf chromatography



From Playdough to Plato

