



SUPERSTAR



Investigating Ink

Organiser's Card



About the activity

This activity is designed to get children thinking about how to identify different inks using chromatography.

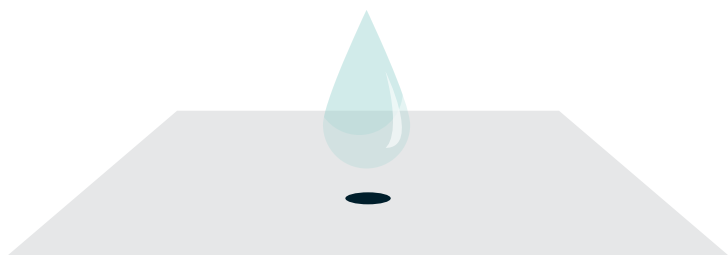
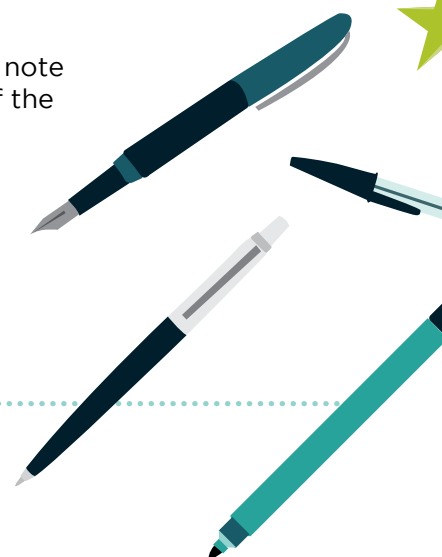
Lady Felicity Feline's prize winning Cocker Spaniel has been dog napped and a note has been sent asking for a ransom. Can the investigators work out which one of the four suspects wrote the note based on the type of ink used?

Through this activity you will support your group to:

- Experiment with different ink pens using chromatography
- Design an experiment to help them identify the pen used to write a note
- Share their conclusion and present evidence to support it

Kit list

- Absorbent paper e.g. blotting paper, white filter paper, white coffee filters
- Four pens (not biros) with black water-soluble ink inside, labelled with the suspects' names – it's better to have a set per group
- Additional pen or black ink for the initial exploration – you must check that the colour separates
- Ransom note (written using one of the pens prior to the activity). Don't worry if it spreads a bit.
- Beakers or pots
- Scissors
- Extra non-permanent marker pens in various colours
- Plain paper for wanted posters



What to do

1. In advance prepare the ransom note according to the instructions in the kit list.
 2. Introduce the activity by reading the news story together and examining the ransom note with the children. Show the children the suspects' pens.
 3. Give the children time to talk about ways of identifying which ink was used to write the ransom note. Give them a black pen or a blob of black ink and some white paper towel to explore the effect of water on ink.
 4. Let the children explore the pens and the note. You will need to cut the ransom note into strips so that groups can each try out their tests.
- Cut more strips than you need to have some spares. You will probably need plenty of them!
5. Some children may need help to examine the different patterns and colours produced by each pen.
 6. Give children time to talk about their evidence and decide who they think the culprit is.
 7. Children can now create a wanted poster to help detectives track down the criminal they have identified. Encourage them to include all the evidence they have collected.
 8. Encourage children to use the evidence from their experiment to justify their decision.

Things to think about

Test the pens/ink prior to the activity by putting marks on pieces of blotting paper and dropping water on them.

Some black inks will separate better than others. You need the criminal's pen to produce a different pattern from the others.

Your ransom note must be written on absorbent paper e.g. blotting paper. Write a large note so there is enough for everyone. Your note could read: Lady Feline. If you want Colin returned safely, put £100,000 in a brown paper bag and leave it under the big oak tree by the town hall at 5:15 pm prompt tomorrow.

Take it further

Ink is made up of a mixture of different colours. Different inks will be made up of different colours even if they look the same. With water-soluble inks you can separate the colours from one another using water (chromatography).

The colour from some other items such as food colouring, jelly beans and other sweets can be separated in the same way.

Chromatography is used to separate and identify all sorts of substances in police work. Drugs can be identified in urine and blood samples, often with the aid of chromatography.

Keywords

- Ink
- Chromatography
- Separation
- Mixture
- Absorbancy
- Water-soluble

Watch out!

Use plastic beakers for this activity.
Any spills should be cleaned up quickly to avoid accidents.
Avoid using permanent marker pens.



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Activity Card

NEWS

Cocker Spaniel caught up in Canine Crime Spree

Earlier this week, Lady Felicity Feline received a ransom note demanding £100,000 for the safe return of Colin, her prize-winning cocker spaniel. Detectives have seized black pens from four prime suspects so that they can carry out ink investigations to find out who sent the note.

“Someone had splashed a drop of water on the note and we spotted something very interesting,” Inspector Khan told our reporter. “With a bit of help we should soon have Colin back.”



Your challenge



The four main suspects are:

Ivor Swagbag
Robyn Banks
Kitty Catburglar
Nick Goods

Help the detectives to match the ink from the ransom note to one of the suspects' pens to find out who has Colin the Cocker Spaniel.



Discuss

What ways could you use to tell the difference between the black pens?
Drop water on black ink and watch what happens.
How might this help to solve the crime?



Getting started

Pens write differently and the colour of the ink can vary. Perhaps you can see these differences if you look closely.

If you have explored what water does to some ink, can you use what you have found out to investigate the suspects' pens? This process is called chromatography.

Test your ideas

One way to test the ink is to drip water onto a sample of the ransom note. Watch what happens. Compare this with blobs of ink from the suspects' pens.

Try to gather as much different evidence as you can.

Can you find out who the dog napper is?

Share your ideas

Why not make a wanted poster which includes all the evidence to help detectives track down the criminal you have identified?

Extra things to do

Is it only black pens that you can test with chromatography?

Are there other things that are coloured that you can test such as jelly beans or food colouring?

Are there other ways of doing chromatography?

