BE A DETECTIVE

The pen tells all!

What you need

- different brands of black felt tip pens (water-soluble)
- cone type coffee filters
- cup
- water

What to do

1. Cut the coffee filter paper into long strips (2 cm x 10 cm).
2. Draw a horizontal line 2 cm from the bottom of a strip of paper with one of the black pens.
3. Label the top of the filter paper strip with the brand of the pen.
4. Pour about 1 cm of water into a cup.
5. Carefully place the bottom end of the filter paper in the water. Make sure the water does not touch the line you have drawn!
6. Bend the top of the paper over the rim of the cup to hold it in place.
7. Repeat steps 2 to 5 with the remaining pens and filter papers.
8. Leave the strips of filter paper to sit for approximately 5 to 10 minutes.

Observation

- Compare the results from different pens.
- If you were solving a case, how would you match a pen to a note written by the criminal or the victim?

Why?

Black ink is a mixture of many different coloured inks. These colours can be separated by a technique called paper chromatography. Each brand of black ink mixes coloured inks differently. The water mixes with the chemicals in the ink as it soaks through the line on the paper, but some chemicals mix better with water than others. Chemicals that don't mix well with water will attach to the paper first and the ones that mix better with water attach higher up. Separating the colours of the chemicals like this is called chromatography. By separating the colours of a black ink used in a crime and comparing the results to tests done on inks from several different pens, police can figure out what type of pen was used. Different techniques are used for permanent markers, as the ink used in them will not dissolve in water.

Did you know?

Detectives rely on forensic science to help them catch criminals. Various techniques are used such as chromatography, fingerprinting and DNA analysis.

DNA is short for deoxyribonucleic acid and is found in every living cell. Like the letters of the alphabet that make up words, DNA combines in different ways to make different living things. DNA determines what people are like and DNA makes you different from your brother, sister and even your dog.

By identifying DNA – from a hair, fingernail or a drop of blood – police can pinpoint who committed a crime.

Web sites

Check out this site for more information on chromatography, chromatography art and more. http://home.att.net/~GCresource/kidschromatography.html

Online crimes to solve at Clue 2002. http://partner.galileo.org/schools/greentree/clue/index.html

Here is an excellent explanation of DNA. http://www.thetech.org/exhibits_events/online/genome/