Food Dye Experiment

Key Stage 2

Scheme of work unit: **4D** Solids, liquids and how they can be separated (Can be related to Art & Design 1B – Investigating Materials)

Intended learning: **4D** Investigate separating out colours within food dyes using chromatography.

Introduction notes:

- Chromatography is the collective term for a family of laboratory techniques for the separation of mixtures.
- Paper chromatography is an analytical technique for separating and identifying mixtures that are or can be coloured, especially pigments.
- The technique is based on a small concentrated spot of the sample being applied to a piece of chromatography paper about 1 cm from the base.
- The paper is then dipped into a suitable solvent, such as ethanol or water.
- The solvent moves up the paper by capillary action. As the solvent rises through the paper it meets and dissolves the sample mixture, which will then travel up the paper with the solvent.
- Different compounds in the sample mixture travel at different rates due to different solubilities in the solvent, and are thus separated out on the paper.

Information:

- About 2.5% of children are sensitive to tartrazine.
- Additives are required to provide safe, appealing and convenient food all year round.
- Consumers often choose stronger and brighter colours made synthetically over natural colours, which in turn encourages more food manufacturers to use these colours.
- The E in E-numbers is short for European Communities. E numbers are issued after a large number of safety tests and expert scrutiny. All approved additives are given an E-number.
- E-numbers between 100-180 are colouring additives.
- Tartrazine should be avoided by asthmatics.
- Some E-numbers are naturally occurring vitamins required by everybody. E.g. E101 is vitamin B2.

Resources required

- 4 strips of filter paper
- 4 sample containers
- Samples of red, green, blue and yellow food colouring (not natural)
- Pencil
- Water
- Plastic pipettes

Practical notes

Containers should ideally be long and thin – we have successfully used sample vials. Food dyes may stain clothes.

Further work

Unit 4D	Link to other separation techniques, such as separating out the pigments in leaves.

Answers:

1. Paul is also sensitive to green food colouring (a mixture of yellow and blue). *Note: The yellow in the red food colouring is not tatrazine.*
2. Tatrazine.