

Separating Colours: When Green is Not Green

The Action

After placing a dot of food colouring on the end of a filter and placing the end of the filter (not the dot) in water, the colours will separate.

Grade Level

Grade 1 - Senses

Grade 5 - Plant Structure and Function

Materials

- Small bottle of green food colouring
- Ruler
- One small cup
- One clothes pin
- Coffee filter
- A tall glass
- Toothpicks
- Water

Instructions

- Cut a long, narrow strip (~3 cm wide) from the center of the coffee filter. Using the toothpick, "paint" a dot with the green food colouring 3 cm from the bottom of the filter strip. Allow the spot to dry.
- In the tall glass, pour water so there is ~2 cm in the bottom of the glass.
- Hang the filter strip over the edge of the glass so that the end just touches the water. (Note: Do not get the green dot wet).
- Use the clothespin to fasten the filter to the glass to keep it from slipping in and observe.
- Optional: The experiment can be repeated using different colours (e.g. black and brown).

Safety

No safety cautions but avoid getting food colouring on clothes because it stains.

Hints

- Paper towel may be used instead of a coffee filter, however, do not use fluffy, soft paper towels because the colours will not separate as well.
- To prevent food colouring stains on the desk or floor, cover the work area with newspaper.

Science Principle

Colours can be mixed to create new colours. These new colours can also be separated into their colour components.

The water "climbs" the filter because the filter attracts the water molecules. Different colours will climb more quickly because some molecules are lighter weight than others. Heavier molecules will move slower and therefore move less. Some molecules are also more attracted to the surface of the filter paper than others.

On most paper, the blue will climb higher than the yellow. However, on brown paper towel the attraction of the molecules is different and the yellow will climb higher than the blue.