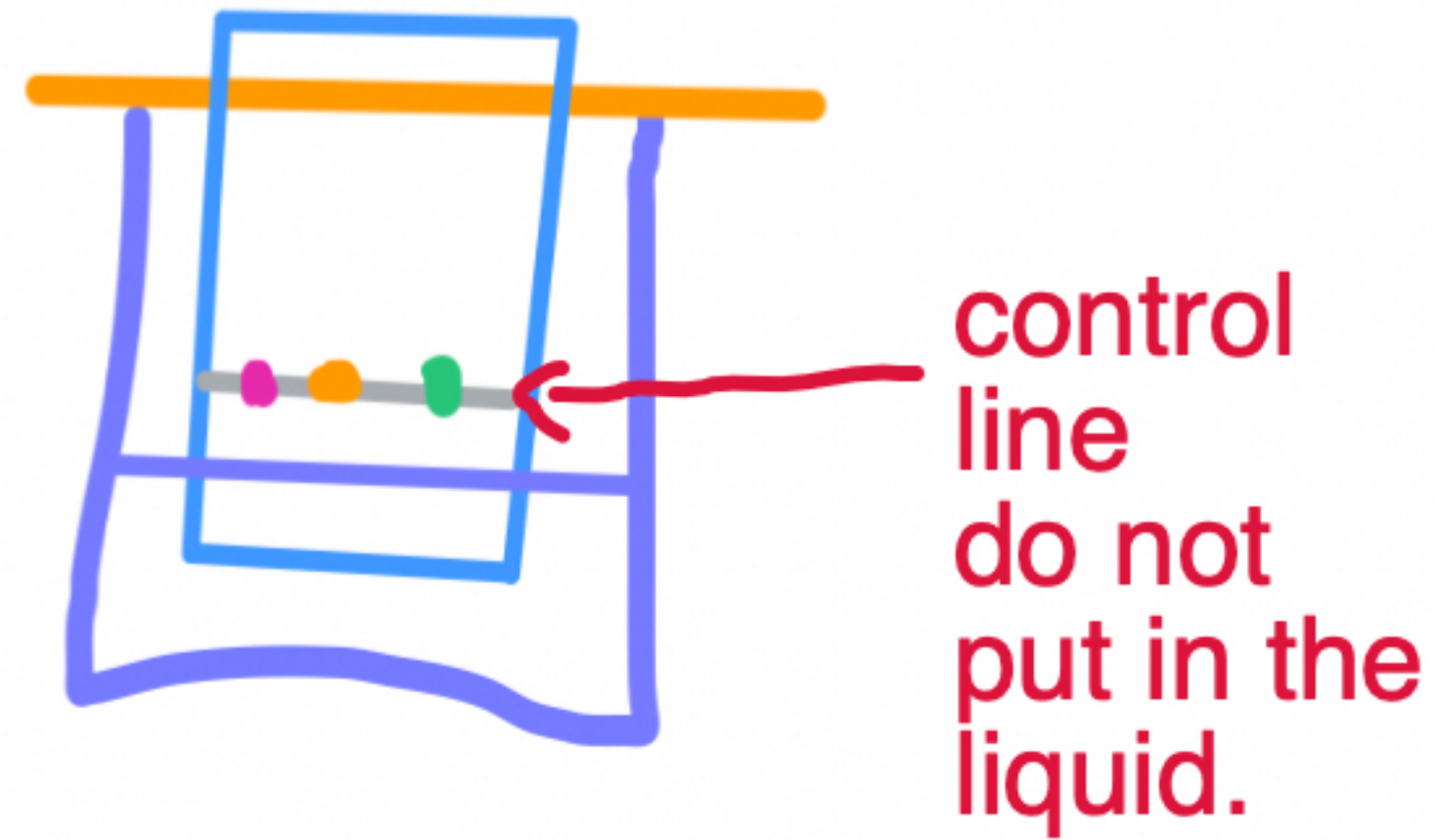


Watch the video and try this at home

## Paper Chromatography

If you want to try this at home:  
Use kitchen roll/paper  
a glass or glass jug or similar and water.  
If you have ethanol, the separation process will  
be clearer and quicker.



We use paper chromatography to separate different colours in substances.  
Different dyes have different solubilities.

- 1) Draw a line with a pencil across a piece of chromatography paper.  
1cm above the bottom of the paper.
- 2) Using a pipette, put a spot of the mixture you are testing on the pencil line and let it dry.

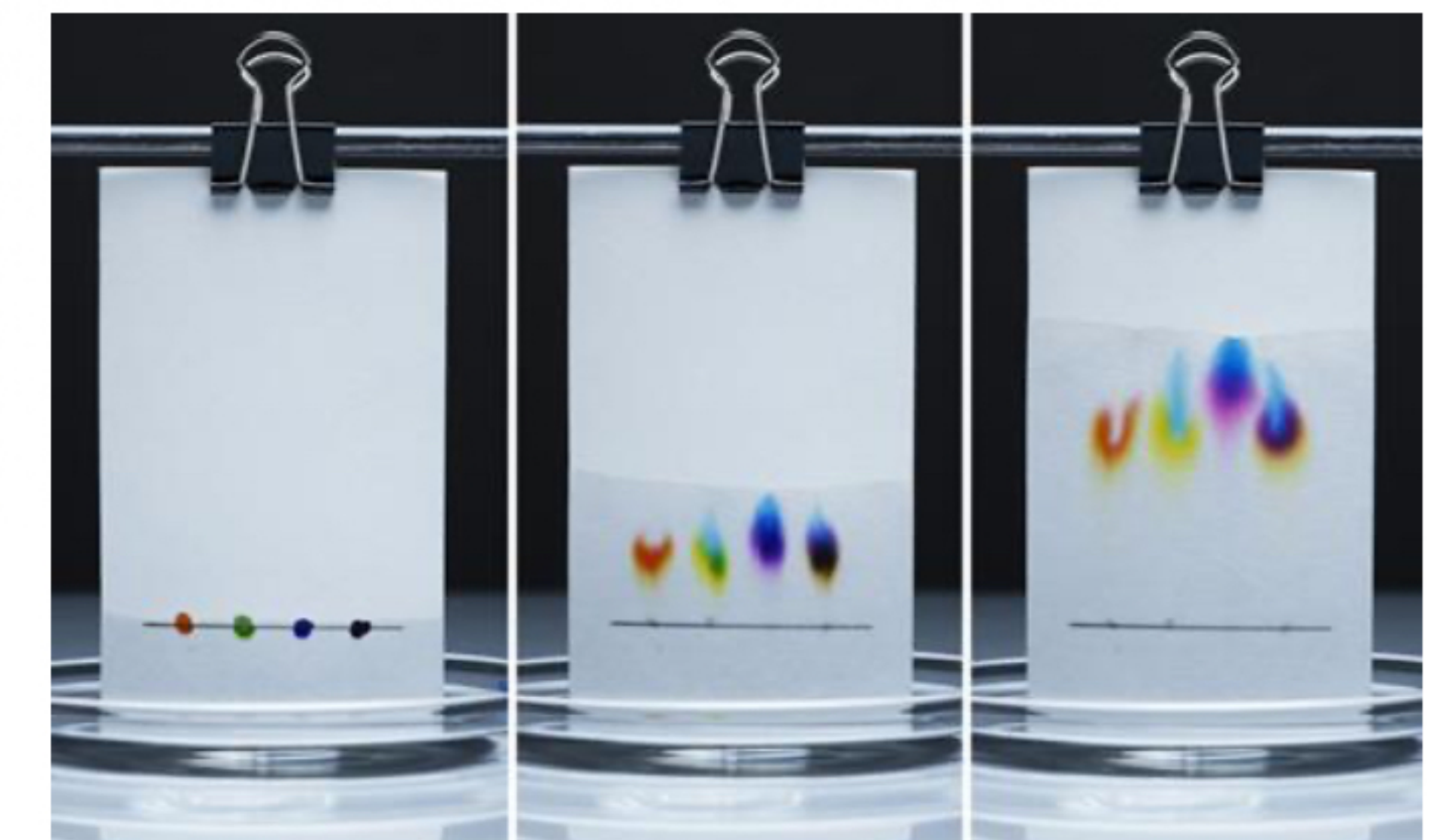
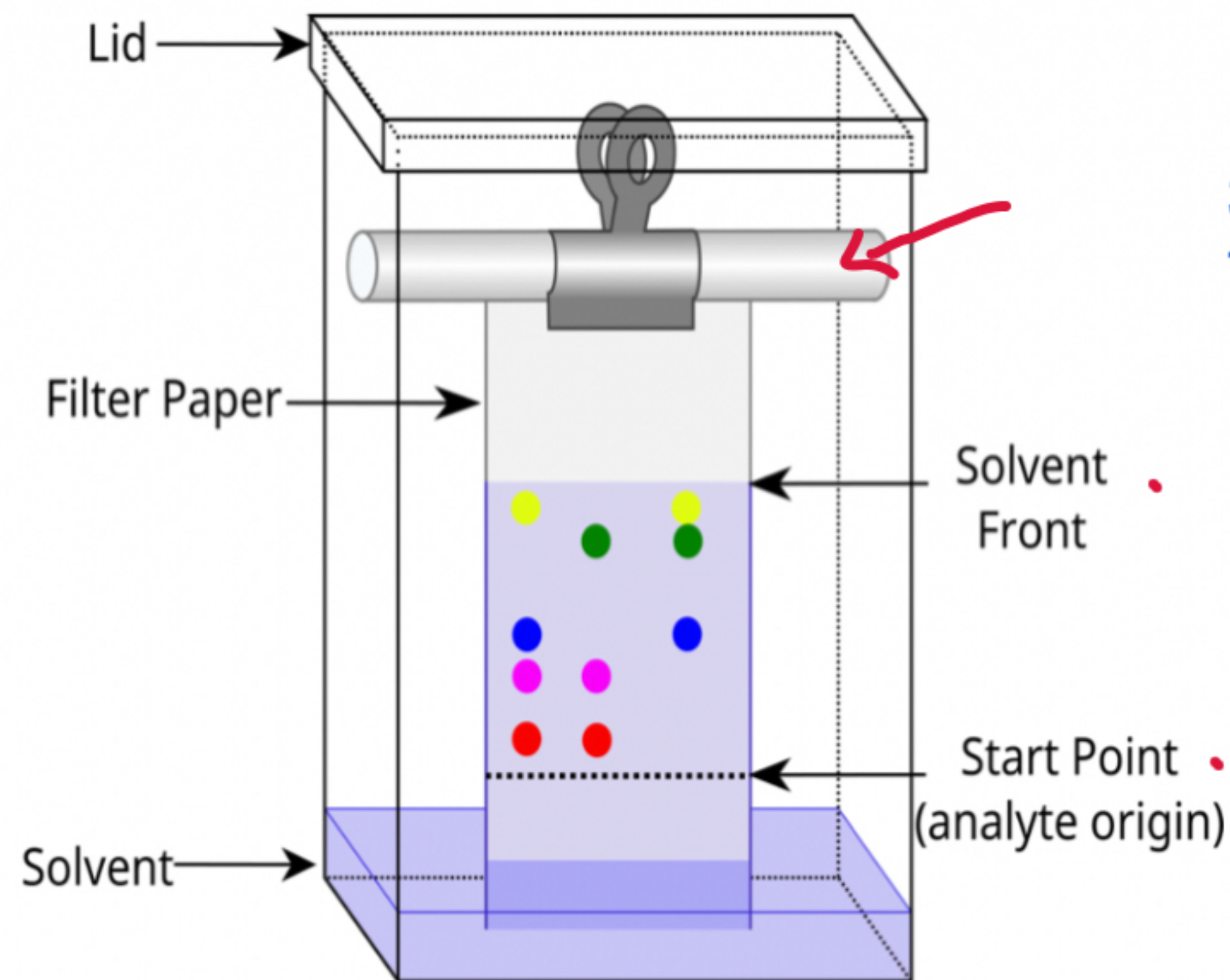


- 3) Suspend the chromatography paper in a beaker that contains a small amount of solvent, so the solvent is below the pencil line so the ink/colouring does not dissolve in the solvent.

- 4) Put a lid on the beaker, to stop the solvent (water mixed with ethanol) evaporating from the surface of the paper.

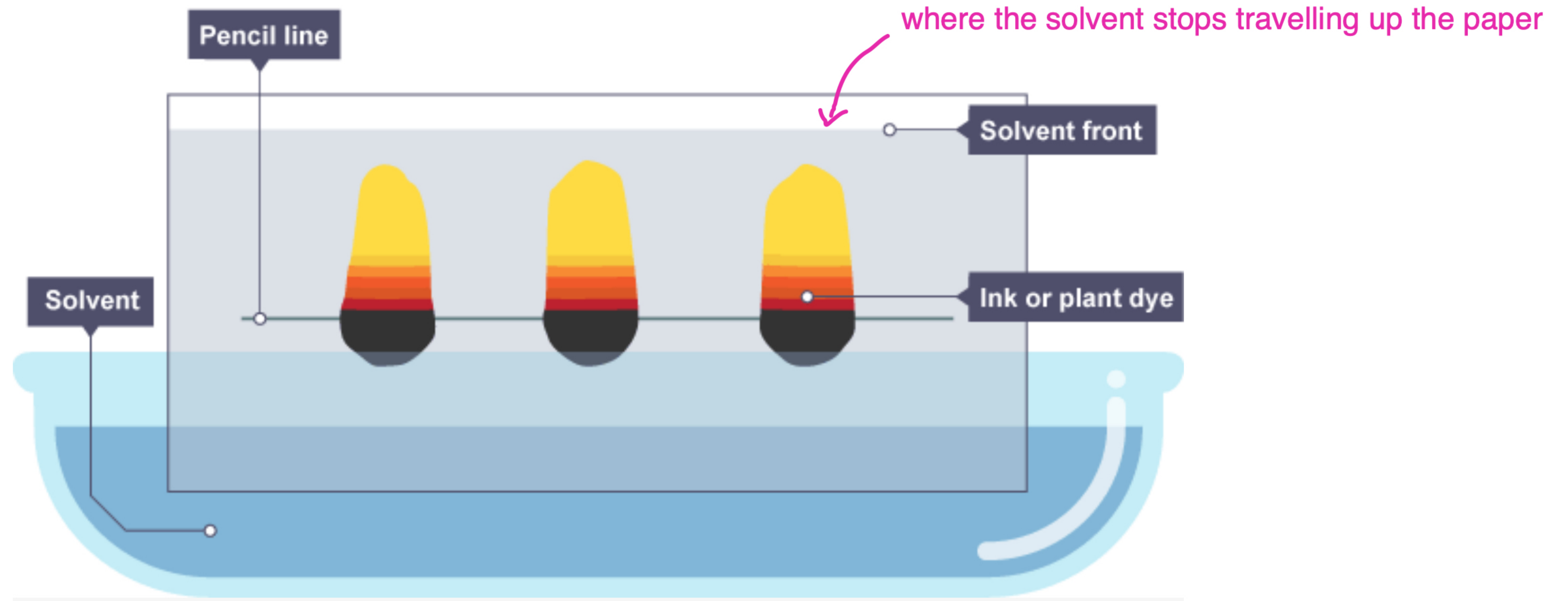
- 5) When the solvent has moved up the paper about 1cm from the top, remove the paper from the beaker and draw another pencil line to show where the solvent got to.  
This is called the solvent front.

- 6) Leave the paper to dry so all the solvent evaporates.



## Paper chromatography

Paper chromatography **i** is used to separate mixtures of soluble **i** substances. These are often coloured substances such as food colourings, inks, dyes or plant pigments.



## Phases

Chromatography relies on two different 'phases':

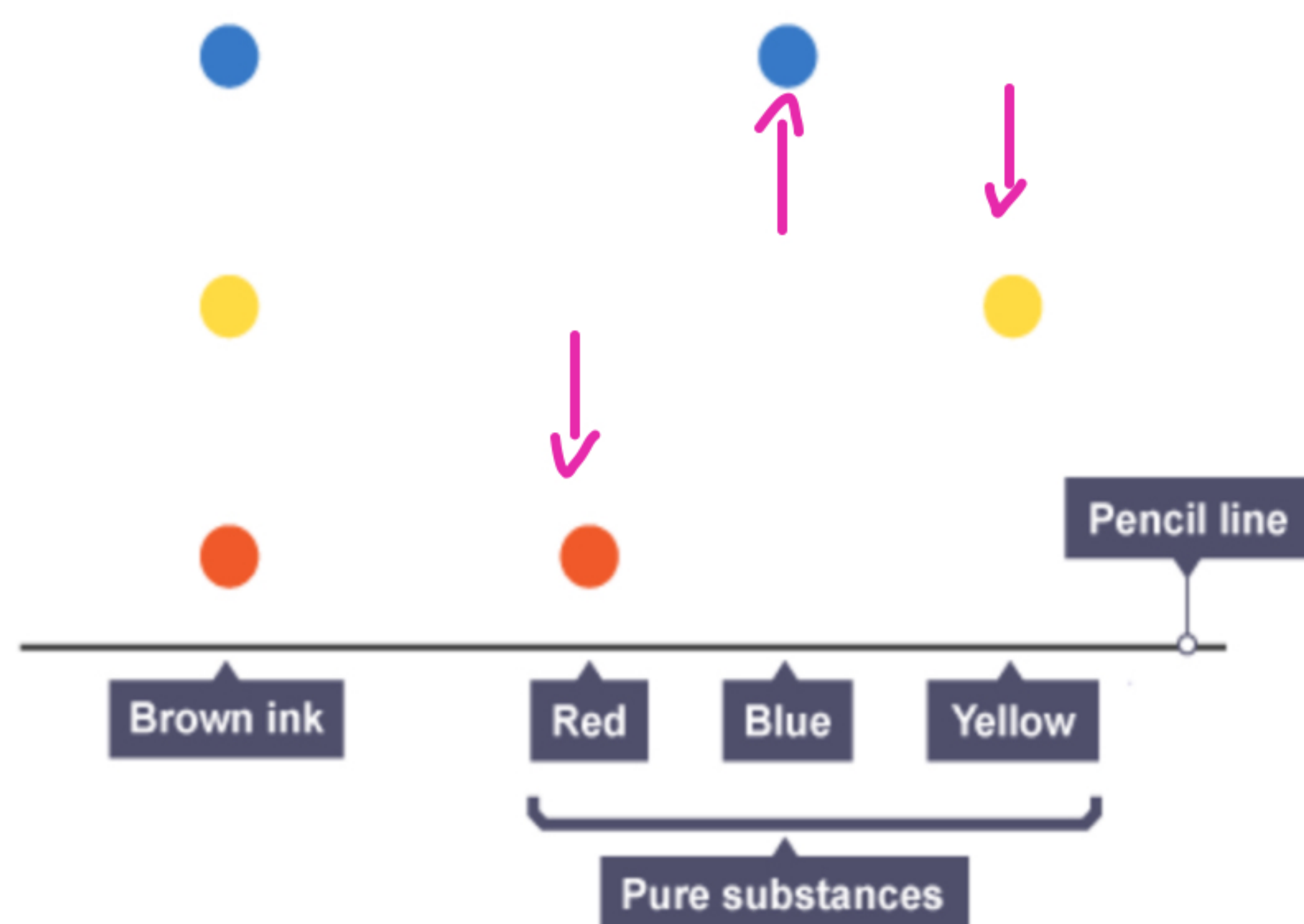
- the stationary phase **i**, which in paper chromatography is very uniform, absorbent paper
- the mobile phase **i** is the solvent **i** that moves through the paper, carrying different substances with it

The different dissolved **i** substances in a mixture are attracted to the two phases in different proportions. This causes them to move at different rates through the paper.

## Interpreting a chromatogram

Separation by chromatography produces a chromatogram **i**. A paper chromatogram can be used to distinguish between pure and impure substances:

- a pure substance produces one spot on the chromatogram
- an impure substance, or mixture, produces two or more spots



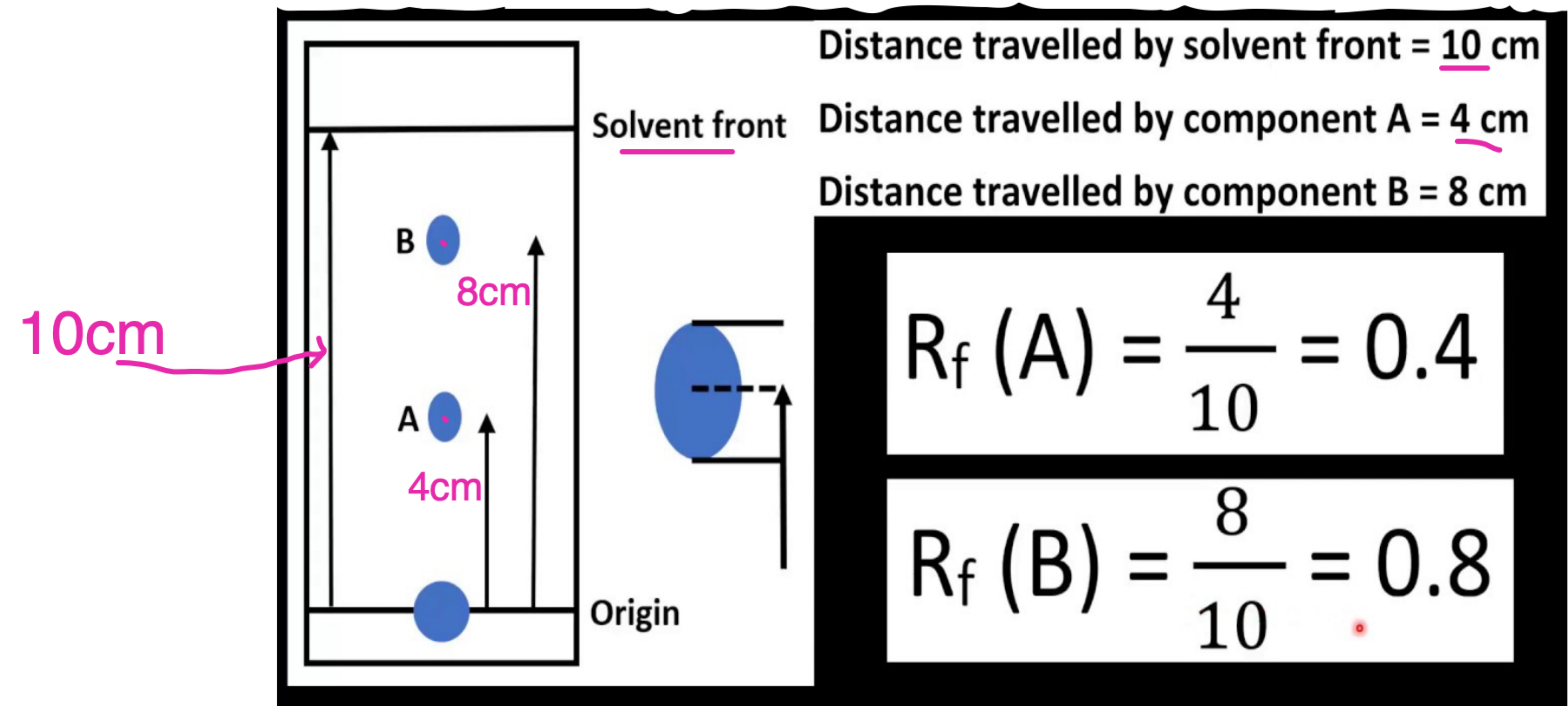
The mixture on the left separated into three substances. The three pure substances made one spot each

A paper chromatogram can also be used to identify substances by comparing them with known substances. Two substances are likely to be the same if:

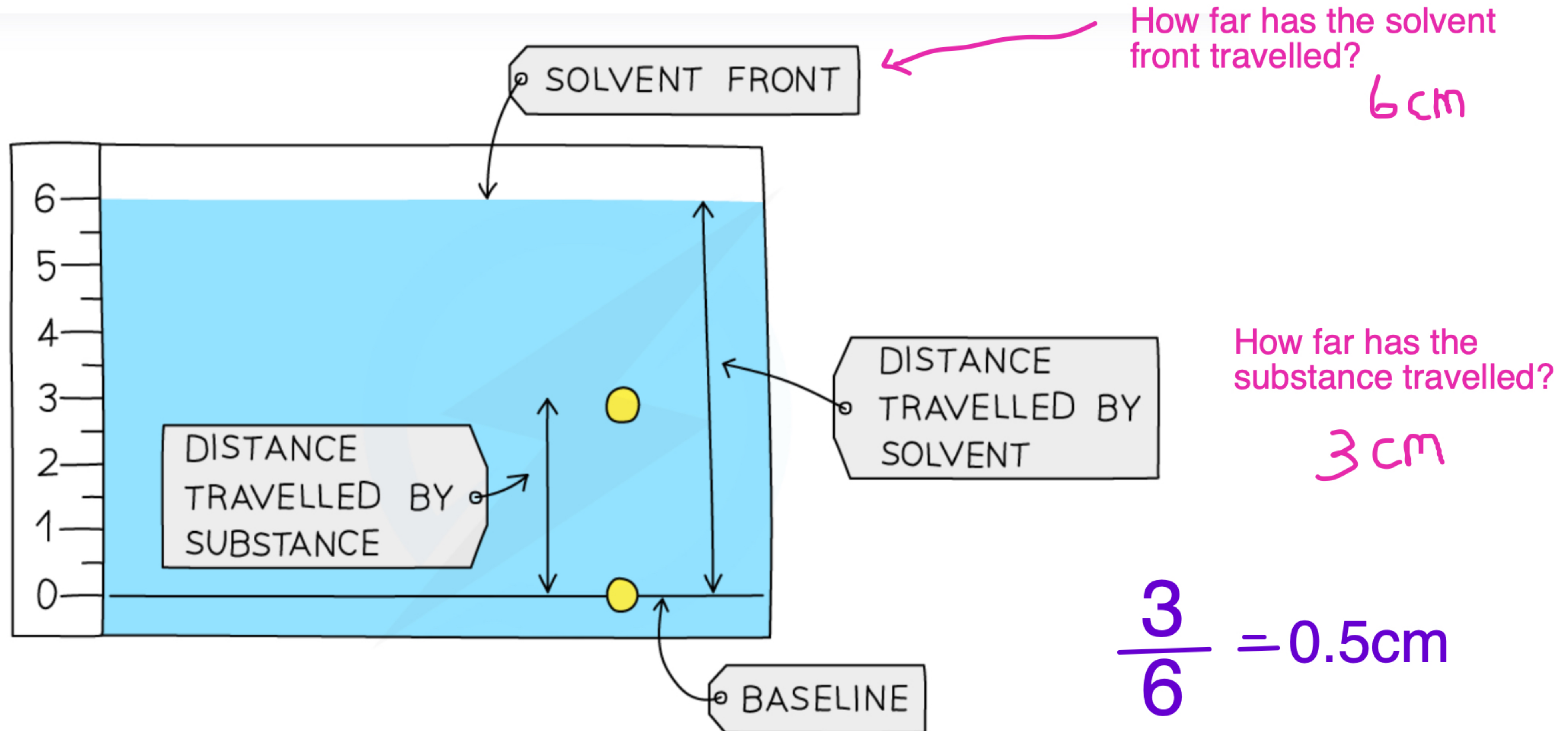
- they produce the same number of spots, and these match in colour
- the spots travel the same distance up the paper

## Calculating R<sub>f</sub> Value

Paper Chromatography is used to separate mixtures of soluble substances in a solution. Paper chromatography works on the principle that some substances are more soluble than others in a solvent. This is used to separate food colourings, inks and dyes.



# Calculating Rf Value



### Chromatography

Q6: Give two uses of chromatography:

to find all different things that make up that colour

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(2 marks)

alternative wording:  
 to separate mixtures  
 and to help identify  
 the substances in that  
 mixture.

Q7: Name the two phases when performing chromatography.

stationary and mobile

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(2 marks)

Q8: Complete the equation.

$$R_f = \frac{\text{distance travelled by the substance (ink/dye)}}{\text{distance travelled by the solvent}}$$

(2 marks)

Q9: How will a pure compound look when run on chromatography paper?

there wont be any different colours, there will be one single colour spot

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(1 mark)

Q10: How can you tell if an ink is insoluable?

The ink dot will not move from the control line/ base line.