

BTEC Applied Science Summer Homework

1. Answer the following questions about the experiment you conducted:

(*You can watch the following video for support* <https://www.youtube.com/watch?v=ZCzgQXGz9Tg>)

a. Why do you think some dyes separate into different colours whilst others do not?

b. Why do you think some colours move further up the paper than others?

c. Can you think of any way to improve the separation between the different spots?

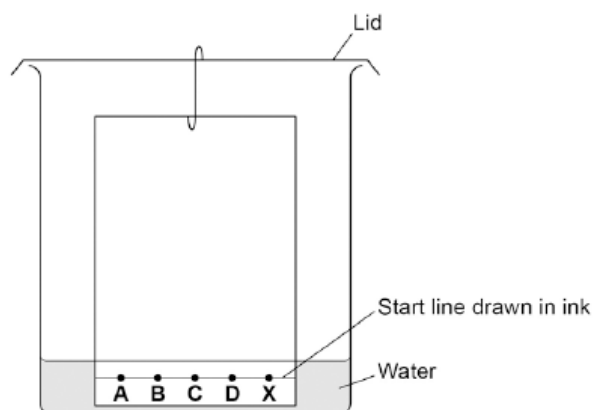
2. A student investigated food dyes using paper chromatography.

This is the method used.

1. Put a spot of food colouring **X** on the start line.
2. Put spots of four separate dyes, **A**, **B**, **C** and **D**, on the start line.
3. Place the bottom of the paper in water and leave it for several minutes.

Figure 1 shows the apparatus the student used.

Figure 1



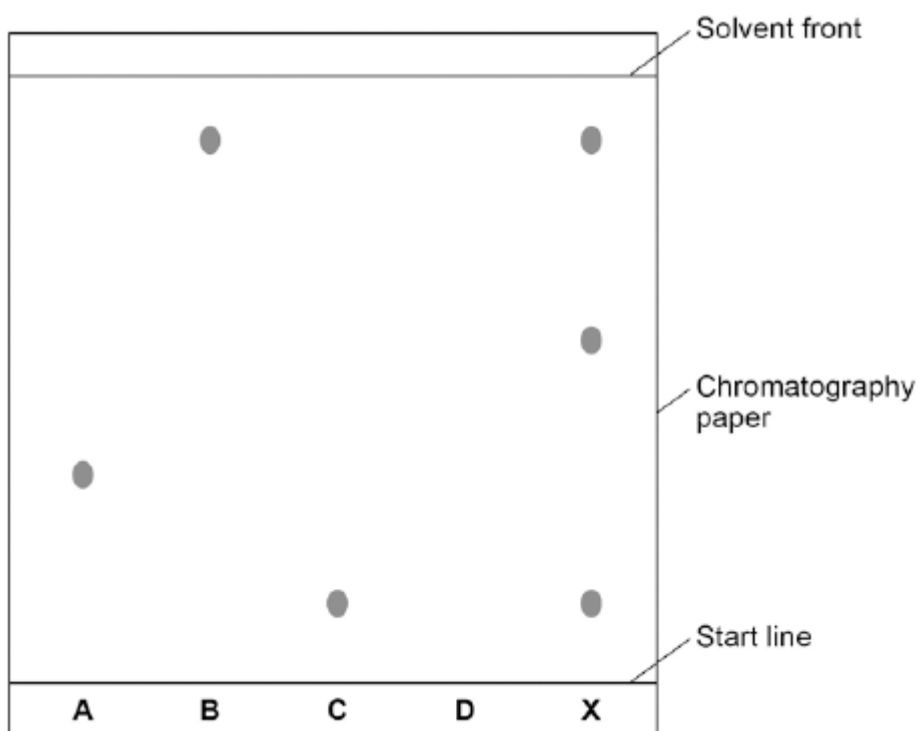
- (a) Write down **two** mistakes the student made in setting up the experiment and explain what problems one of the mistakes would cause.

(2)

- (b) Another student set up the apparatus correctly.

Figure 2 shows the student's results. The result for dye **D** is not shown.

Figure 2



Calculate the R_f value of dye **A**

Give your answer to two significant figures.

R_f value = _____

(3)

- (c) Dye **D** has an R_f value of 0.80. Calculate the distance that dye **D** moved on the chromatography paper.

Distance moved by dye **D** = _____

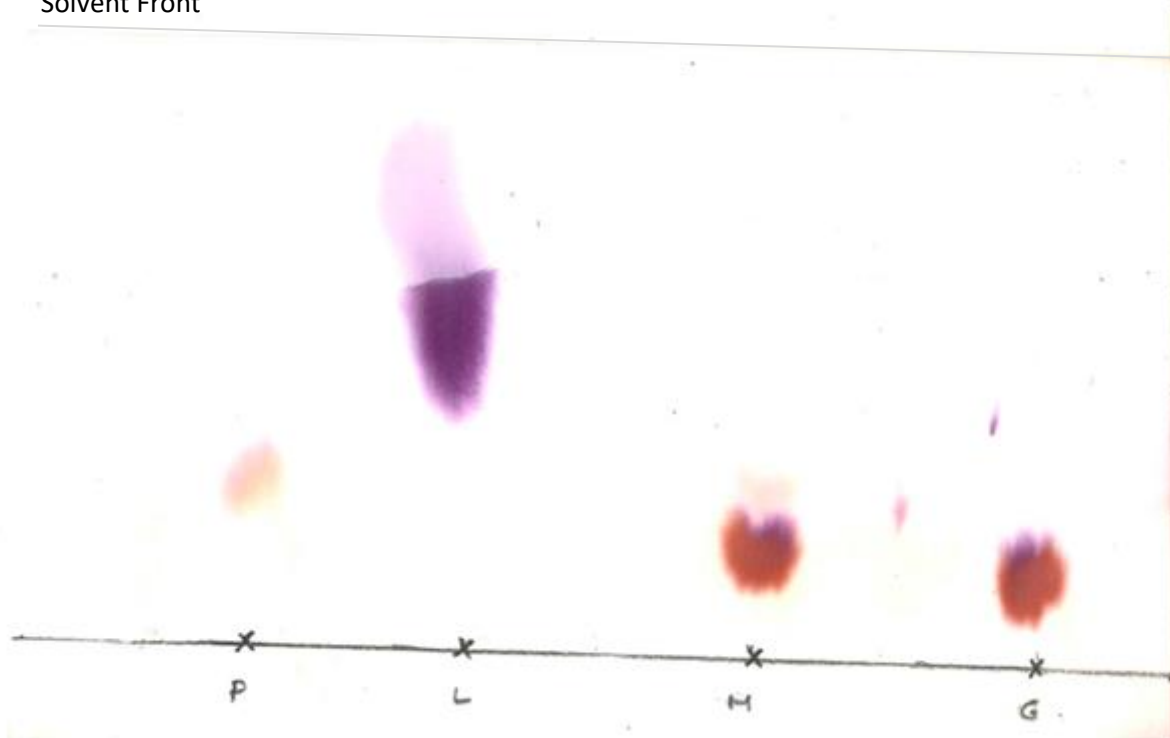
(1)

- (d) Explain how the different dyes in **X** are separated by paper chromatography.

(4)

3. For the following Chromatogram Calculate the Rf values for different substances. Identify if there are any mixtures present and if so can you indicate what they might be made up of.

Solvent Front



4. Research chromatography (paper or TLC) and write an *explanation* of how the technique works (do not write a method of how to set up a chromatogram).

In your writing you should refer to the **mobile phase** and the **stationary phase**. Use diagrams where necessary. Also, use and define the following terms in your writing: affinity, capillary action, polarity.