

BTEC Applied Science Summer Homework

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

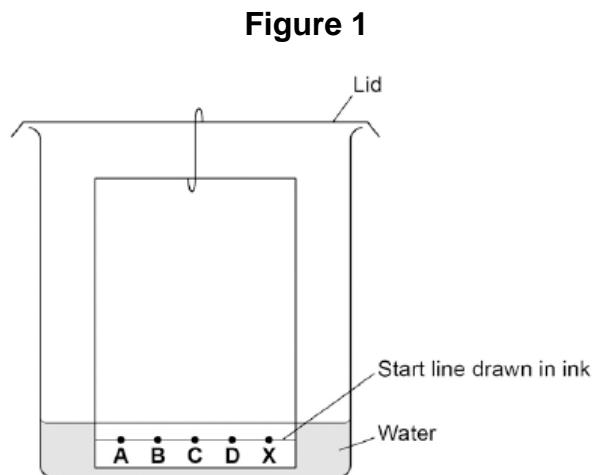
 - c. Can you think of any way to improve the separation between the different spots?

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.

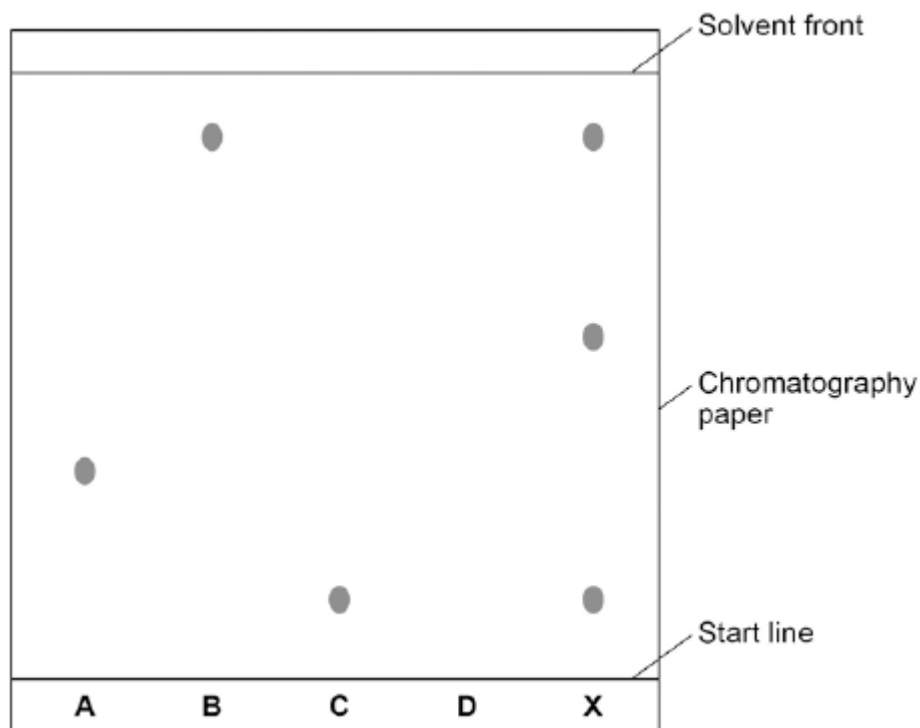


- (a) Write down **two** mistakes the student made in setting up the experiment and explain what problems one of the mistakes would cause.

(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. Research chromatography (paper or TLC) and write an explanation of how the technique works. In your writing you should refer to the **mobile phase** and the **stationary phase**. Use diagrams where necessary. Also, define the following terms: affinity, capillary action, polarity