

Gateway Science Physics A

J249/01 Physics A P1-P4 and P9 (Foundation Tier)

Question Set 18

Two students, **A** and **B**, use different methods to see magnetic field patterns.

- (a) (i) Describe how student **A** could use a compass to plot a magnetic field pattern.

You may draw a diagram to help you answer this question.

Place a magnet in the middle of a sheet of a paper. Place the compass [3]

at one end of the magnet and plot the needle position. Then move to the other end of the magnet and plot the needle position and join to form a line. Repeat below the magnet and on the ends of the magnets

- (ii) Describe how student **B** could use iron filings to show a magnetic field pattern.

You may draw a diagram to help you answer this question.

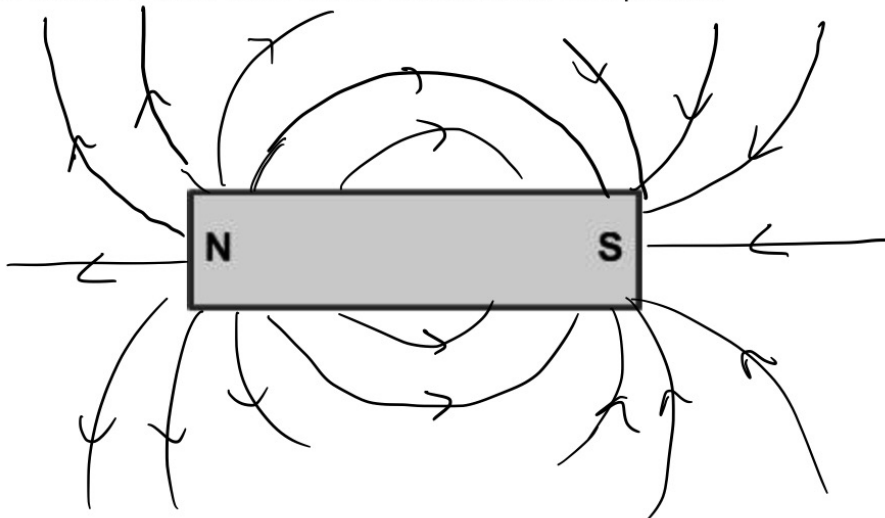
Place a paper over your bar magnet and pour the iron filings on to the paper and field lines will form. [2]

- (b) Their teacher prefers the method used by student **A**.

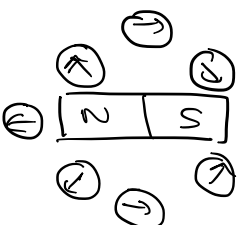
Suggest **one** reason why. Iron filings are very messy and easy to spill. [1]

- (c) Sketch the field pattern the students would find around a bar magnet.

Your sketch should show the direction of the field pattern.

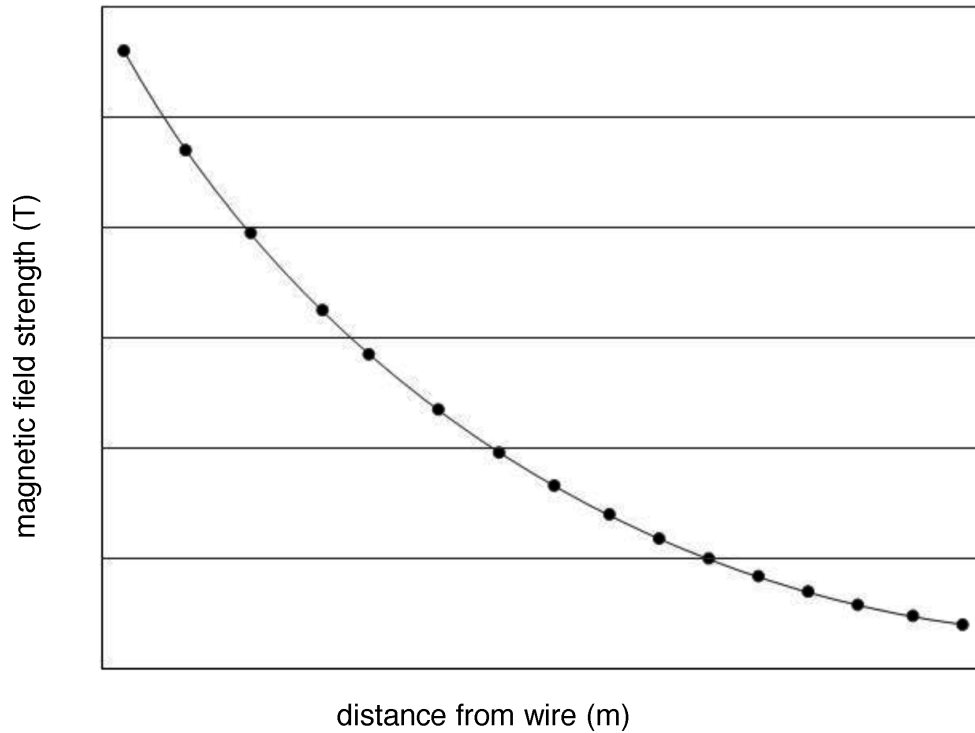


[2]



(d) The two students investigate the magnetic effect of a current-carrying wire.

Look at the graph of their results.



What trend is shown by the graph?

As distance increases the magnetic field strength decreases, therefore this is a non-linear relationship

[2]

Total Marks for Question Set 18: 10

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