

GCSE Physics B (Twenty First Century Science)
J259/01 Breadth in Physics (Foundation Tier)

Question Set 18

1

James investigates the magnetic field around a wire. He uses a vertical wire passing through a sheet of card, as shown in **Fig. 1.1**.

He maps the magnetic field using a compass.

The current in the wire is travelling upwards.

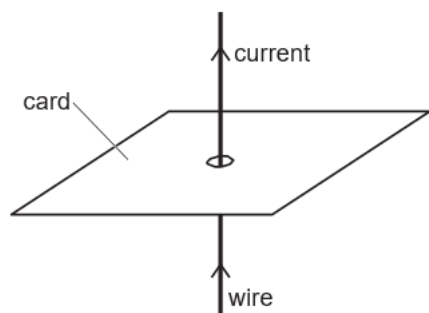


Fig. 1.1

- (a) On the diagram in **Fig. 1.2**, draw the pattern of magnetic field lines that James should expect to find.

Draw at least **three** magnetic field lines and include **arrows** to show the direction of the magnetic field.

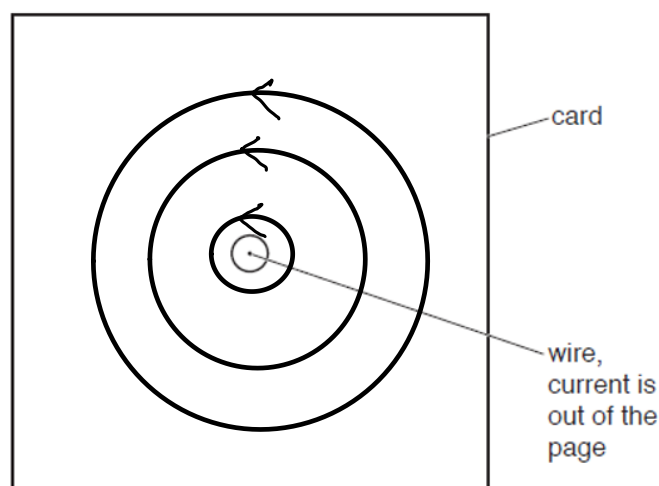


Fig. 1.2

- (b) At the edge of the card, James cannot detect a magnetic field caused by the wire. He thinks this is because the magnetic field is very weak at the edge of the card. [3]

- (i) Explain why the magnetic field is weak at the edge of the card.

Magnetic field strength decreases with distance [1]

- (ii) Describe **one** change that James could make to increase the strength of the magnetic field at the edge of the card.

Increase the current through the wire [1]

- (c) When the current in the wire is switched off, the compass points north. Explain why the compass points north. [1]

With no current there is no magnetic field so it naturally points north as default [1]

Total Marks for Question Set 18: 6

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