

Magnets Attract and Repel

Attract, repel or no force?

tick one for A and B, then explain why

1 **S N** **N S**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

2 **S N** **S N**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

3 **S N** **steel**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

4 **N S** **nickel**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

5 **S N** **copper**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

6 **N S** **plastic**
 A B
☐ Attract ☐ Repel ☐ No force
 Why? _____

Circle the magnetic materials: copper iron plastic nickel aluminium steel wood cobalt

Magnetic fields

A magnetic field is a... _____

Draw a bar magnet and the magnetic field lines around it

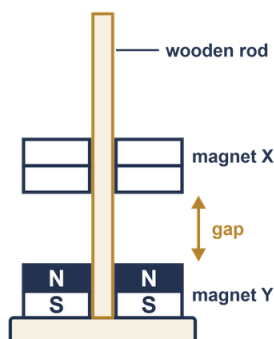
- ☐ N and S labelled ☐ At least 4 field lines ☐ Symmetrical pattern ☐ Arrows point from N to S
☐ Lines closest together at the poles

Exam-style question

Two ring magnets sit on a wooden rod. Magnet X floats above magnet Y.

- (a) Write **N** and **S** on magnet X to show its poles. [1]
 (b) Explain why magnet X floats. [2]
 (c) Give a reason why the rod is made of wood and not steel. [1]
 (d) Magnet X is turned upside down and put back on the rod. Describe and explain what happens. [2]
 (e) A copper coin is placed on top of magnet X. Explain what happens to the size of the gap. [2]

(Total for question = 8 marks)



ANSWER

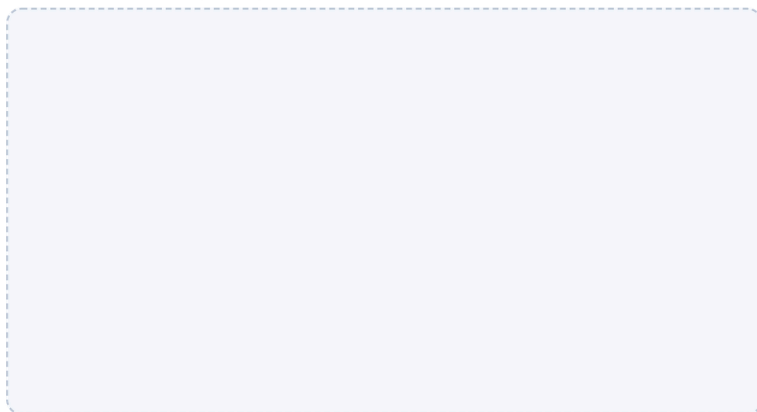
Magnetic Field Lines and Induced Magnets

Practical — plot the field around a bar magnet

4.7.1.2

Draw round your own bar magnet, then plot its field

Label N and S. Use a plotting compass to plot at least 4 field lines.



Method — list the steps

How do you plot one field line?

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

Words to use: ☐ plotting compass ☐ pencil dot ☐ tip of the needle ☐ move the compass ☐ repeat ☐ join the dots ☐ arrow N → S

Induced magnets

4.7.1.1

An induced magnet is...

KEY WORDS TO USE

- ☐ magnetic material
- ☐ becomes a magnet
- ☐ placed in
- ☐ magnetic field

Test: is a paperclip an induced magnet?

1



no force

Touch paperclip **A** with paperclip **B**. There is _____ force of attraction.

2



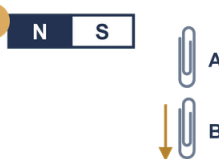
Put paperclip A in the _____ of the bar magnet.

3



Touch A with B again. B is now _____, so A is an _____ magnet.

4



Take A out of the field. B falls off, so A is _____ a magnet.

Exam-style question

A student has a steel bar magnet and an iron nail.

- (a) State **one** difference between a permanent magnet and an induced magnet. [1]
- (b) The nail is held near the north pole of the bar magnet. Explain why the nail is attracted to the magnet. [2]
- (c) Explain why an induced magnet is always **attracted**, and never repelled, by a permanent magnet. [2]
- (d) The nail is moved away from the magnet. Describe a test to show that the nail is no longer a magnet. [2]

(Total for question = 7 marks)

ANSWER
