

GCSE Combined Science: Trilogy

Worksheet: Poles of a magnet

TIME 20 min	TOTAL 21 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Poles of a magnet

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

0 1 . 1 Which statement is correct?

Tick (✓) **one** box.

Like poles attract and unlike poles repel.

☐

Like poles repel and unlike poles attract.

☐

All poles attract each other.

☐

All poles repel each other.

☐

[1 mark]

0 1 . 2 Two magnets exert forces on each other without touching.
What type of force is this?

.....

.....

.....

[1 mark]

0 2

A student holds two bar magnets close to each other.

0 2 . 1

The north pole of one magnet is brought close to the north pole of the other magnet.

What happens?

Tick (✓) **one** box.

The magnets attract each other.

☐

The magnets repel each other.

☐

There is no force between the magnets.

☐

[1 mark]

0 2 . 2

The force between the two magnets is an example of which type of force?

Tick (✓) **one** box.

Contact force

☐

Friction

☐

Non-contact force

☐

Tension

☐

[1 mark]

0 2 . 3

Where are the magnetic forces of a bar magnet strongest?

.....

.....

.....

[1 mark]

0 2 . 4

Name **one** magnetic material.

.....

.....

.....

[1 mark]

0 3

0 3 . 1

Which **two** of these are magnetic materials?

Tick (✓) **two** boxes.

Aluminium

Cobalt

Copper

Iron

Zinc

☐
☐
☐
☐
☐

[2 marks]

0 3 . 2

Give **one** everyday object that uses a permanent magnet.

.....
.....

[1 mark]

0 4

A student hangs a chain of small iron nails from the north pole of a bar magnet, one below another. Eventually, adding another nail to the bottom of the chain makes no difference — the new nail simply does not become magnetised enough to attract a further nail.

0 4 . 1

Explain why the chain cannot be extended indefinitely.

.....
.....
.....
.....

[2 marks]

0 5

A student hangs a small iron nail from the north pole of a bar magnet. A second nail is then hung from the bottom of the first nail, and a third nail from the bottom of the second, forming a chain.

0 5 . 1

Explain why the first nail is attracted to the magnet.

[2 marks]

0 5 . 2

Explain why the second nail is attracted to the first nail.

[1 mark]

0 5 . 3

The student carefully pulls the magnet away from the top nail.
Describe and explain what happens to the chain of nails.

[2 marks]

0 5 . 4

Describe the difference between a permanent magnet and an induced magnet.

[2 marks]

0 6

A student has an unlabelled bar magnet and a small plotting compass that is known to be working correctly.

0 6 . 1

Describe how the student could use the compass to find out which end of the bar magnet is its north pole.

.....

.....

.....

.....

.....

.....

[3 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Poles of a magnet · 21 marks

Question 1 (2 marks)

01.1 [1 mark]

Correct: Like poles repel and unlike poles attract.

01.2 [1 mark]

Answer: A non-contact force

- a non-contact force (1)
-

Question 2 (4 marks)

02.1 [1 mark]

Correct: The magnets repel each other.

02.2 [1 mark]

Correct: Non-contact force

02.3 [1 mark]

Answer: At the poles

- at the poles / at the ends (1)
-

02.4 [1 mark]

Answer: Iron (or steel, cobalt or nickel)

- iron / steel / cobalt / nickel (1)
-

Question 3 (3 marks)

03.1 [2 marks]

Correct: Cobalt; Iron

03.2 [1 mark]

Answer: A fridge magnet (or any similar example).

- e.g. a fridge magnet / a magnetic door catch / a compass needle / a magnetic phone case (1)
-

Question 4 (2 marks)

04.1 [2 marks]

Answer: The magnet's field gets weaker with distance, so eventually a nail is too weakly magnetised to attract another below it.

- the magnetic field (and so the induced magnetism) becomes weaker further from the permanent magnet (1)
 - eventually the field reaching a new nail is too weak to induce enough magnetism in it to attract another nail below (1)
-

Question 5 (7 marks)

05.1 [2 marks]

Answer: The nail becomes an induced magnet, and induced magnetism always causes attraction.

- the nail becomes an induced magnet (when it is in the magnetic field) (1)
 - induced magnetism always causes a force of attraction (1)
-

05.2 [1 mark]

Answer: The first nail has become a magnet and induces magnetism in the second nail.

- the first nail is magnetised / is an induced magnet, so it induces magnetism in the second nail (which is attracted) (1)
-

05.3 [2 marks]

Answer: The chain falls apart because the nails lose their induced magnetism quickly.

- the nails fall apart / drop off (1)
 - an induced magnet loses most or all of its magnetism quickly when it is removed from the magnetic field (1)
-

05.4 [2 marks]

Answer: A permanent magnet has its own magnetic field; an induced magnet is only a magnet while it is in a magnetic field.

- a permanent magnet produces its own magnetic field (all the time) (1)
 - an induced magnet only becomes a magnet when it is placed in a magnetic field (1)
-

Question 6 (3 marks)

06.1 [3 marks]

Answer: Bring one end of the magnet towards the compass; the compass needle's south end is attracted to the magnet's north pole, so the needle's response reveals which pole is which.

- bring one end of the bar magnet slowly towards the compass (from a distance, so the compass is not too strongly affected at first) (1)
 - observe which way the compass needle points: the compass needle's south end is attracted towards a north pole (unlike poles attract) (1)
 - if the north (usually coloured) end of the compass needle points towards the magnet's end, that end of the magnet must be a south pole; if the needle's south end points towards it, that end is the magnet's north pole (1)
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