

Magnets and Magnetic Fields

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Will a magnet pick up a steel paperclip, an aluminium can and a copper coin?

Step 1 · Magnetic materials

Iron, steel, nickel and cobalt are magnetic.

Step 2 · Sort

Steel paperclip: yes. Aluminium and copper are metals, but not magnetic.

Answer: Only the steel paperclip

Check: Not all metals are magnetic.

2. Now try one with the steps

Which way do magnetic field lines point around a bar magnet?

Step 1 · Convention

Step 2 · So

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Name the four common magnetic materials. [1]

2. What happens when two north poles are brought together? [1]

3. What happens when a north pole and a south pole are brought together? [1]

4. Is aluminium a magnetic material? [1]

5. What is a magnetic field? [1]
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6. Outside a bar magnet, which way do field lines point? [1]
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7. Where is the magnetic field of a bar magnet strongest, and how does a field diagram show this? [2]
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8. Describe how to use a plotting compass to draw the field around a bar magnet. [3]
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9. How can you tell whether a metal bar is a magnet or just made of iron? [2]
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10. Why do magnetic field lines never cross? [1]
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11. Explain why a compass needle points north. [2]
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12. The Earth's magnetic pole near the geographic North Pole attracts the N pole of a compass. What type of magnetic pole must it be? [1]
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13. Recycling plants separate steel cans from aluminium cans. Suggest how, and explain why it works. [2]
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14. Two bar magnets are placed with their north poles facing each other. Describe the field between them. [2]
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4. Before you hand it in

"All metals are magnetic."

Iron, steel, nickel and cobalt are magnetic; copper, aluminium, gold and silver are not.

Drawing field lines from S to N.

Arrows go from N to S outside the magnet.

"The Earth's North Pole is a magnetic north pole."

Near the geographic North Pole there is a magnetic south pole.