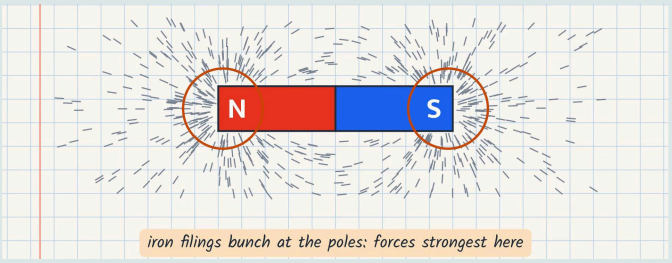
Magnetic poles

Permanent and induced magnets

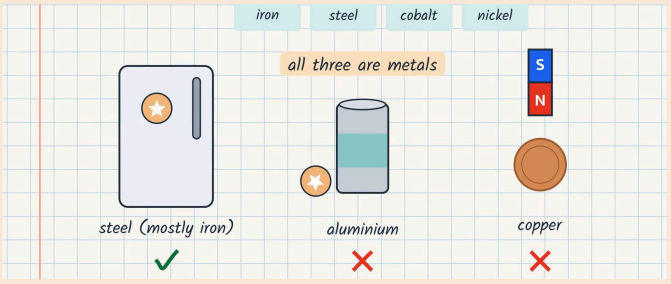
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Summary sheet

1 Magnetic poles



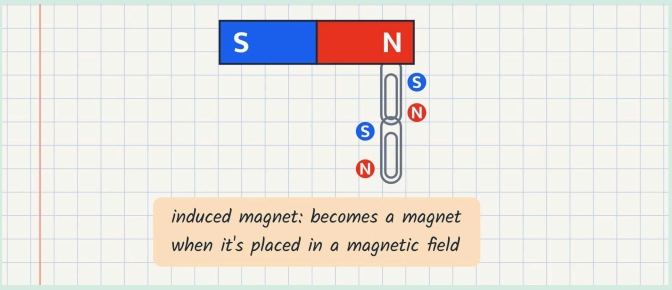
- Every magnet has a **north pole** and a **south pole**. The magnetic forces are **strongest at the poles**.
- **Like poles repel; unlike poles attract.** These are **non-contact forces**: the magnets don't need to touch.

2 Magnetic materials



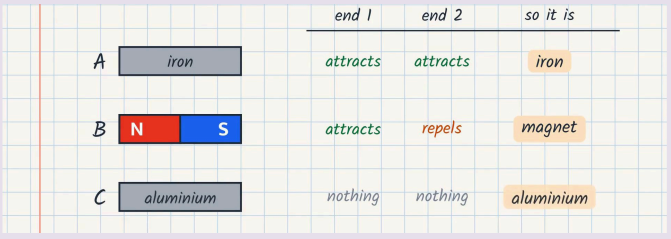
- The four magnetic materials: **iron, steel, cobalt and nickel**.
- **Not all metals are magnetic**: aluminium and copper are not. Steel is mostly iron, so a fridge door is magnetic.

3 Induced magnets



- A **permanent magnet** makes its own magnetic field. An **induced magnet** becomes a magnet only while it is in a magnetic field, and loses most or all of its magnetism quickly when taken out.
- The force between a magnet and an induced magnet is **always attraction**: the near end becomes the opposite pole.

4 Proving a magnet



- Attraction proves nothing on its own (it could be iron). **Only repulsion proves something is a magnet.**
- Three-bar test: the bar that repels at one end is the **magnet**; attracted at both ends is **iron**; no effect is **not a magnetic material** (e.g. aluminium).

Exam tip

Call poles "north" and "south". Never "positive" and "negative": those words are for electric charges.

Check yourself

- 1 Two south poles are brought together. What happens?
- 2 A nail is attracted to both ends of a magnet. Is the nail a permanent magnet?

Answers: 1. They repel (like poles) 2. No: it's an induced magnet, made of a magnetic material