Half Term Notes

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Magnetic Materials

Magnetic	Not
Iron	Copper
Nickel	Aluminium
Cobalt	Zinc

- Mainly, just Iron, Cobalt and Nickel, plus their alloys.
- Iron is Fe, Cobalt Co, and Nickel Ni.
  - One example alloy is steel with Carbon, Iron and Tin.
  - Or Neodynium with Boron, Neodynium and Iron.
- Iron has very magnetic atoms, and they all line up in the same way to make a magnetic solid.
- Chromium has very magnetic atoms, but they don't line up or make a magnetic solid.

Laws

- Opposite magnetic poles attract.
- Like magnetic poles repel.

General Theory

- A Permanent Magnet can attract a possibly magnetic solid to create a temporary magnet, and this is induced magnetism.
- The permanent magnet can magnetise something like a paper clip.
- This is a magnetically soft material.
- A Magnetically hard material cannot be induced to be a magnet.

Field Lines

1. You draw a box around a magnet on a piece of paper.
2. Then place a plotting compass somewhere on the magnet.
3. Then, place a mark where the plotting compass was pointing.
4. Place the other end of the plotting compass (where the magnet just was next to) at the mark.
5. Rinse and repeat until the line either arcs off the paper or comes back to the magnet.
6. After each cycle draw a line between the dots. Also add arrows from the N end of the magnet to the S end on the lines.
7. Then repeat all around the magnet.
8. Maybe use mutliple magnets to get interesting diagrams.

Referring to the question on the ppt, C is the right answer, with lines flowing from N to S, in concentric ovals.

Domains

- In solids full of magnetic atoms, there are lots of domains each with lots of atoms pointing in certain directions, and all atoms in a domain point in the same direction.

- In a solid like magnetite (an ore of iron), all the domains face the same way which makes the solid magnetic.
- In a solid like Chromium, even if the atoms are magnetic, the domains don't face the same way, and so the solid is non-magnetic.