Magnetism and electromagnetism

Answers

GCSE science knowledge recall

This topic online

Q	Answer	Remember
1	repel	Like poles repel, unlike poles attract.
2	at the poles	The field lines are closest together at the poles.
3	permanent magnet	An induced magnet only becomes magnetic while it is in another magnetic field.
4	attraction	The induced magnet lines up so that unlike poles face each other.
5	steel	Iron, steel, cobalt and nickel are the magnetic materials to learn. Copper and aluminium are not magnetic.
6	north	North to south, outside the magnet - the way a compass needle points.
7	plotting compass	The needle is a tiny magnet that lines up along the field.
8	magnetic field	The Earth's core behaves like a giant bar magnet.
9	concentric circles	The circles are centred on the wire and get further apart as you move away.
10	increase	More current, stronger field; further from the wire, weaker field.
11	solenoid	Inside a solenoid the field is strong and the same everywhere, like a bar magnet.
12	electromagnet	The iron core makes the field much stronger, and it switches off when the current stops.
13	more turns	More turns, more current, or an iron core all strengthen it.
14	When the current is switched on the electromagnet picks up iron and steel, and when the current is switched off it drops them.	Being able to switch the magnet off is the whole point.
15	motor effect	The wire's own field interacts with the magnet's field.
16	Fleming's left-hand rule	First finger = field, seCond finger = current, thuMb = motion.
17	length	F = B I l, with the wire at right angles to the field.
18	tesla	Named after Nikola Tesla. The Earth's field is only about 0.00005 T.
19	0.1	0.1 × 2 × 0.5 = 0.1 N.
20	reverses	Reversing either the current or the field flips the force.
21	rotation	Forces act in opposite directions on the two sides of the coil, so it spins.

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Q	Answer	Remember
22	more current	Anything that increases the force on each side of the coil speeds it up.
23	induced potential difference	This is the generator effect. If the circuit is complete, a current flows too.
24	zero	You only get an induced p.d. while the field through the coil is changing.
25	bigger	Faster movement or a stronger magnet both increase the induced p.d.
26	alternator	A dynamo uses a split-ring commutator to give direct current instead.
27	microphone	It works like a loudspeaker in reverse.
28	step-up	More secondary turns means a bigger output p.d. than input p.d.
29	60	Vp ÷ Vs = np ÷ ns, so the voltage goes up by the same factor of 5 as the turns.
30	Only an alternating current makes a changing magnetic field in the iron core, and a changing field is needed to induce a potential difference in the secondary coil.	A steady direct current gives a steady field, which induces nothing.

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