

PHYSICS AS 90937

Demonstrate understanding of aspects of electricity and magnetism

Level 1, 4 Credits

This achievement standard involves demonstrating understanding of aspects of electricity and magnetism and may include using methods when solving related problems.

Static Electricity

- positive and negative charge
- conductors and insulators
- uniform and non-uniform charge distributions
 - explanation of attraction or repulsion
- earthing; how earthing removes the excess charges
- electrical discharge in air
- separation of charge by friction
- charging by contact

DC Electricity

- voltage, V (volts, V)
- current, I (amps, A)
- resistance, R (ohms, Ω) ; R_T is total resistance
- power, P (watts, W or $J s^{-1}$)
- energy (work done), E (joules, J)
- series circuits and simple parallel circuits
- circuit diagrams
- the relationships $V = IR$, $P = IV$, $P = \frac{E}{t}$, $R_T = R_1 + R_2 + \dots$

Magnetism

- magnetic field - region in which a force is felt from a magnet or an electric current
 - proximity of lines of force indicating magnetic field strength
 - magnetic field directions
- interactions and the result of interactions
 - magnetic field of bar magnets
 - the earth's magnetic field
 - magnetic fields due to currents in straight wires and solenoids
- right-hand grip rule (thumb – direction of conventional current, curl of fingers shows direction of magnetic field)
- electromagnets
- the relationship $B = \frac{kI}{d}$
 - B – magnetic field strength (T), k – constant (in TmA^{-1}), I – current (A), d – distance from wire (m)

