Lesson Plan: Electric Current

This lesson plan includes the objectives, prerequisites, and exclusions of the lesson teaching students how to use the formula $I = Q/t$ to calculate the current through a point in simple circuits given the charge moving past that point in a given time.

Objectives

Students will be able to:

▸ recall that electric charge is measured in coulombs,

▸ recall that electric current is measured in amperes (A),

▸ understand that electric current is the flow of electric charge,

▸ understand that in a typical electric circuit, current is the flow of negatively charged electrons along the wires,

▸ understand that the negatively charged electrons do move, but the positively charged nuclei do not,

▸ understand that conventional current is in the opposite direction to the movement of electrons and that this is because historically it was thought that the positive charges were moving, but this was later proven to be incorrect,

▸ use $I = \dfrac{Q}{t}$ in all permutations.

Prerequisites

Students should already be familiar with:

▸ what electric charge is.

Exclusions

Students will not cover:

▸ alternating current or time-varying currents,

▸ electron beams,

- Ohm's law,
- parallel circuits,
- the distinction between series and parallel circuits,
- how chemical cells work,
- how a source of potential difference actually creates the potential difference,
- metallic bonds,
- structure of metals,
- the band theory of solids,
- valence electrons,
- conductivity and resistivity,
- static electricity,
- induced electric currents,
- magnetism.