

Checklist

What you should know

After studying this subtopic, you should be able to:

- Explain the properties of electrical conductors and insulators.
- Describe cells as the source of emf in a circuit.
- Describe electric potential difference as the work done per unit charge to move a positive charge between two points along the path of the current, and electric current as a flow of charge.
- State the advantages and disadvantages of different sources of electrical energy.
- Define resistance as $R = \frac{V}{I}$ and define resistivity as $\rho = \frac{RA}{L}$.
- Understand Ohm's law and identify the ohmic and non-ohmic behaviour of electrical conductors.
- Understand that resistors can have variable resistance.
- Identify series and parallel circuits along with the circuit symbols of electrical components.
- Explain electric potential difference, current and resistance in series and parallel circuits.
- Determine the electrical power P dissipated by a resistor.
- Understand the relationship between emf ε and internal resistance r as given by $\varepsilon = I(R + r)$.
- Determine emf and internal resistance from a graph.

Practical skills

Once you have completed this subtopic, go to:

- Practical 7: Investigating the resistivity of a conducting wire (<https://app.kognity.com/study/app/physics/sid-423-cid-762593/book/investigating-the-resistivity-of-a-conducting-wire-id-46511/>) in which you will measure and examine resistivity.
- Practical 8: Measuring the internal resistance of a cell (<https://app.kognity.com/study/app/physics/sid-423-cid-762593/book/measuring-the-internal-resistance-of-a-cell-id-46512/>) in

which you will plot the relationship between emf and internal resistance for various cells.