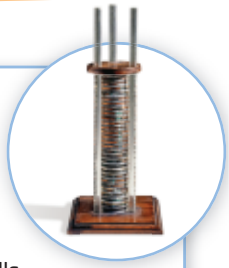
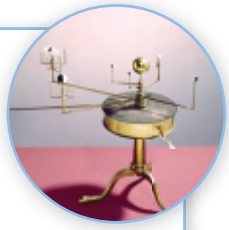
Chapter 11 Summary



11.1 Cells and Batteries

Key Concepts

- A cell generates an electric current through chemical reactions that involve two electrodes and an electrolyte.
- Cells are classified as dry or wet, and as primary or secondary.
- A battery is a connection of two or more cells.



11.2 Electric Circuits: Analogies and Characteristics

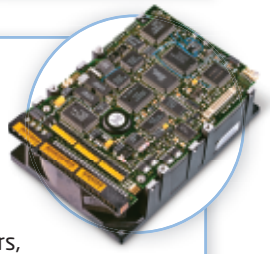
Key Concepts

- An electric circuit is a closed path along which electrons that are powered by an energy source can flow.
- Electrical resistance is a property of a substance that hinders electric current and converts electrical energy to other forms of energy.
- An electric current is the flow of electric charge in a circuit.
- Potential difference is the difference between the electric potential energy per unit of charge at two points in a circuit.

11.3 Measuring the Properties of Simple Circuits

Key Concepts

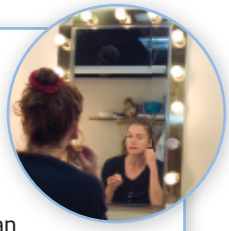
- Circuit diagrams represent the components and connections in an electric circuit.
- Each pole connection on a meter must trace back to a terminal at the electrical source that has the same polarity.
- At a parallel connection, there is more than one path along which electrons can flow.
- At a series connection, electrons can flow along only one path. At a parallel connection, electrons can flow along more than one path.



11.4 Measuring Electrical Resistance

Key Concepts

- Four factors affect the resistance of a wire: the type of material; the length (a longer wire has greater resistance); the diameter (a wire with a larger diameter has lower resistance); and the temperature (a hotter wire has greater resistance.)
- A resistor is an electrical component with a specific resistance.
- Ohm's law states that, for most conductors, the ratio of potential difference (V) to current (I) is a constant called the resistance (R).
- A non-ohmic conductor does not obey Ohm's law.



11.5 Series and Parallel Circuits

Key Concepts

- In a series connection, the current is the same at any point. The total resistance is the sum of the resistances of all the loads.
- The potential difference across loads in series is the sum of the potential differences across all the loads.
- The current entering a parallel connection of loads is the sum of the currents through all the loads. The total resistance is less than the smallest resistance of any load.
- The potential difference is the same between the terminals of any load in a parallel connection.