

## Chapters 34 & 35: Electric Circuits

---

**Text:**Chapter 34

Think and Explain: 1-3, 6-8, 10

Think and Solve: 1-6

Chapter 35

Think and Explain: 1-10

Think and Solve: 1-4

**Vocabulary:**

Ohm's Law, resistance, resistivity, superconductor, series, parallel, voltmeter, ammeter, current, amps, volts, ohms, equivalent resistance, circuit, short circuit, open circuit, kW-h, AC, DC

**Equations:**

$$I = \frac{Q}{t} \quad V = \frac{\text{Energy}}{Q} \quad V = IR \quad P = IV \quad R_{eq} = \sum R_i \quad \frac{1}{R_{eq}} = \sum \frac{1}{R_i}$$

Constants:  $e = 1.6 \times 10^{-19} \text{ C}$

**Key Objectives:***Concepts*

- explain what happens to current and voltage in series and parallel circuits.
- correctly interpret a circuit diagram.
- compare and contrast an ammeter and a voltmeter.
- explain what happens to electrons and energy in a circuit.
- compare and contrast an insulator, conductor and superconductor.
- apply the law of conservation of charge to a circuit.
- apply the law of conservation of energy to a circuit.
- given a circuit made of identical light bulbs, be able to predict the relative brightness of each bulb and what would happen if bulbs were unscrewed or shorted.
- explain what happens to electrons and energy when a light bulb is on and shining.
- explain how the outlets in your home are connected and why.
- compare and contrast AC and DC electricity and identify their sources.

*Problem Solving*

- solve for the missing variable in Ohm's Law.
- calculate total charge or current given the current or total charge.
- convert between total charge and number of electrons.
- calculate the total energy from either power and time or voltage and charge.
- calculate the total cost of running an appliance for a given amount of time.
- calculate the equivalent resistance for resistors connected in series or parallel.
- calculate the missing variables (V, I, R) for a series, parallel or compound circuit.