15.2 Electric Current

ELECTRIC CURRENT

Electric current is the quotient of the quantity of charge that moves past a point and the time interval during which the charge is moving.

$$I = \frac{q}{\Delta t}$$

Quantity	Symbol	SI unit
current	I	A (ampere)
amount of charge	q	C (coulomb)
time interval	Δt	s (second)

Unit Analysis

$$\frac{\text{coulomb}}{\text{second}} = \frac{\text{C}}{\text{s}} = \text{A}$$

Note: One coulomb per second is equivalent to one ampere.

MODEL PROBLEM

Electric Current and Charge

The electrical system in your home operates at a potential difference of 120.0 volts. A toaster draws 9.60 A for a period of 2.50 min to toast two slices of bread.

(a) Find the amount of charge that passed through the toaster.

(b) Find the amount of energy the toaster converted into heat (and light) while it toasted the bread.