

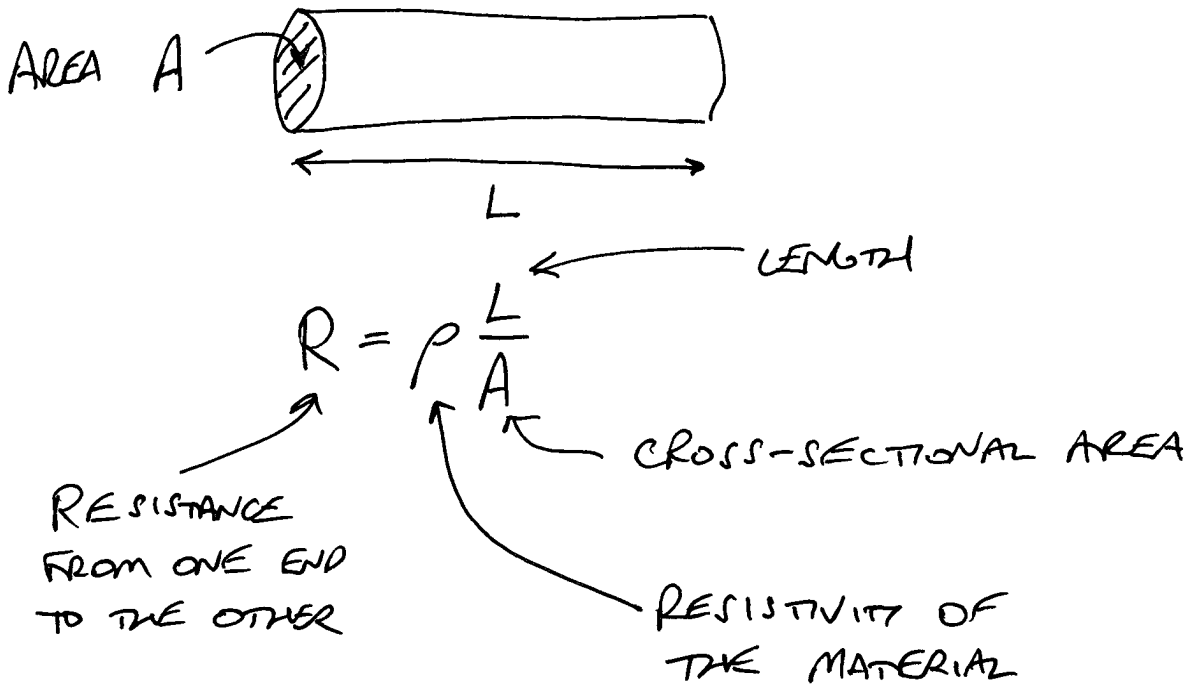
2012 FEB 10

RESISTIVITY

SYMBOL: ρ

UNITS: $\Omega \cdot m$

RELATIONSHIP BETWEEN RESISTANCE AND RESISTIVITY



$$R = \rho \frac{L}{A}$$

$$A = \pi r^2 = \pi \left(\frac{1.628 \times 10^{-3} \text{ m}}{2} \right)^2 = 2.1 \times 10^{-6} \text{ m}^2$$

$$R = (1.68 \times 10^{-8} \Omega \cdot \text{m}) \frac{(26 \text{ m})}{(2.1 \times 10^{-6} \text{ m}^2)} = 0.21 \Omega$$

$$V = IR = (12 \text{ A})(0.21 \Omega) = 2.52 \text{ V}$$

ELECTRIC POWER

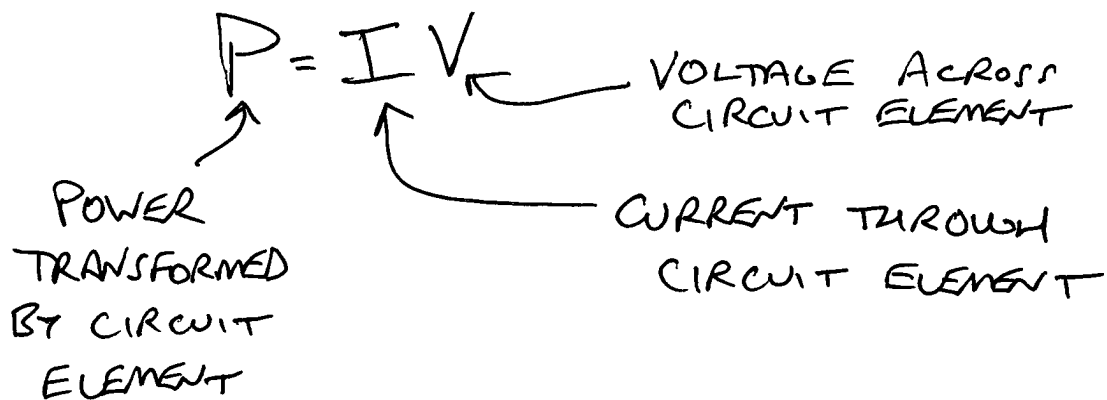
POWER = ENERGY TRANSFORMED / TIME

UNITS: WATTS (W)

SYMBOL: P

$P = IV$ CAN USE FOR

- BATTERY
- RESISTOR



FOR A BATTERY, WE TALK ABOUT THE POWER GENERATED OR SUPPLIED.

FOR A RESISTOR, WE TALK ABOUT THE POWER DISSIPATED.

FOR A RESISTOR,

$$P = IV = I^2 R = \frac{V^2}{R}$$

FOR A LIGHT BULB,

BRIGHTNESS IS PROPORTIONAL TO POWER
DISSIPATED.