

Power,
E.M.F.,
and
Internal Resistance

Power

- Power is defined as the rate at which energy is used by or supplied to the circuit.
- Power is dissipated in resistors (as heat)

$$P = \frac{W}{t}$$

$$W = qV \quad \text{and} \quad q = It$$

$$W = ItV \quad \text{or} \quad \frac{W}{t} = IV$$

$$P = IV$$

$$V = IR$$

$$P = I^2R$$

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

E.M.F.
(Electromotive Force)

- Emf is the work per unit charge made available by an electrical source.
- The amount of energy that would be available if it were not for resistance.
- Units: Volts

Internal Resistance

- All conductors have resistance
- Therefore all electrical equipment has resistance
 - This includes batteries
- In batteries, this inherent resistance is referred to as internal resistance
