

Voltage : Notes/W.S.-20

The **voltage** or **potential difference** across a device is equal to the energy delivered per coulomb of electrons.

$$\text{VOLTAGE} = \frac{\text{ENERGY}}{\text{CHARGE}}$$

The symbol for voltage is V (units are volts V). The symbol for energy is E (units are joules J). The symbol for charge is Q (units are coulombs C).

$$V = \frac{E}{Q}$$

Problems:

- 1) A battery delivers 240 joules of energy to 12 coulombs of charge. Find the voltage of the battery.
- 2) A car battery has a voltage of 12 volts. Find the energy it will deliver when moving 45 coulombs of charge.
- 3) A 30 volt battery delivers 1080 joules of energy. Find the number of coulombs transferred.
- 4) A small cell delivers 0.07 joules to a charge of 0.20 coulombs. Find the voltage.
- 5) A flashlight bulb requires a 3.0 volt battery. If 0.40 C of charge is transferred through the bulb, how much light energy is produced?
- 6) A room heater is plugged into a 120 volt outlet. It radiates 1800 joules of heat energy each second. How many coulombs of electrons move through the heater in one second?

Answers: 1) 20 V, 2) 540 J, 3) 36 C, 4) 0.35 V, 5) 1.2 J, 6) 15 C.