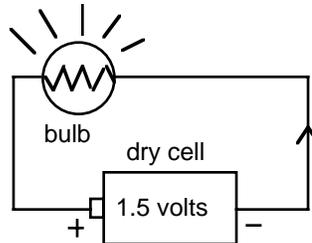# Current : Notes/W.S.-10

Current cannot flow through a conductor unless there is a complete circuit. A **circuit** is a path or loop so that the electrons which come from a cell or generator can get back to where they started. An example of a simple circuit is shown below.

A simple circuit

Electrons flow through the copper wire from the negative end of the dry cell to the bulb where the electrons lose their energy. This energy becomes light. The electrons then move to the positive end of the cell. They then get more energy from the chemical reactions which occur within the cell.

Electric current flows through the wire the way water flows through a pipe.

Electrons are very small, so we use the "**Coulomb**" (symbol C), a very large number, to measure the quantity of electrons. One Coulomb equals 6.24×10^{18} electrons. The current or rate of flow of charge, is measured in coulombs per second.

$$\text{CURRENT} = \frac{\text{CHARGE}}{\text{TIME}}$$

The symbol for current is I (units are amperes A). The symbol for charge is Q (units are coulombs C). The symbol for time is t (units are seconds s).

$$I = \frac{Q}{T}$$

Problems:

1) What is a circuit?

2) Give the symbols and units for: a) current   b) charge   c) time.

3) In a dry cell, electrons come from the _____ (positive or negative) end.

4) Electrons _____ (gain or lose) energy in the bulb. Electrons _____ (gain or lose) energy in the dry cell.

5) 1.00 Coulomb = _____ electrons.

6) If 3.0 Coulombs flow in a circuit for 2.0 seconds, the current is _____ amperes.

7) If 42 Coulombs flow in a circuit for 7.0 seconds, the current is _____ amperes.

8) If a current of 5.0 amperes flows for 3.0 seconds, how many Coulombs of electrons have moved around the circuit? _____

9) Find the current through a hair dryer if 640 C of electrons flow in 1.3 minutes. _____ .

10) How many seconds will it take to move 130 C through an electric pump, if the current is 0.85 A?

Answers: 1) A circuit is a complete path for electrons to travel., 2)a) I(Amperes), b) Q(Coulombs), c) t(seconds), 3) negative, 4) lose, gain, 5) 6.24×10^{18} electrons, 6) 1.5, 7) 6.0, 8) 15, 9) 8.2 A, 10) 153s.