Ohm’s law and

**Resistivity.**

Ohm’s law: explains the relationship between current (amps), voltage (volts) and resistance (ohms).

**Ohm’s law assumes that the conductor that the voltage is being sent through creates a constant resistance.**

 **\*\*This doesn’t apply to all material.**

**Conductors that produce a consistent resistance are called “Ohmic”. The ones that don’t are called “non – Ohmic”.**

**Equation:**

 **Resistance () = Voltage (V)**

 Current (A)

Example: If an iron (for clothes) carries a current of 6.4 A when connected to a 120 V source, what is the resistance?

 R = V = 120 V = 19

 I 6.4 A

Resistance among conductors and insulators changes depending on what they are made of and how much friction is produced between the electrons and the material that the electricity is flowing through.

If a material produces more friction when the electrons flow through it the more resistance is created.

If the conductor produces more resistance than another the current will drop more across the conductor that produces the most resistance.

Resistivity: is a value that is unique to an “Ohmic” material that indicates how much a material resists the flow of current.

The higher the resistivity the more the material resists current.

Equation:

Resistance (R) =

 Resistivity ( m) x length of material

 Area of a cross section of wire

Example: If a nichrome conductor (resistivity = 1.5 x 10 –6 ohm meters) had a cross section of 3.24 x 10 –7 m2, and the length of the material was 2.5 m, what is the resistance?

R = L = 1.5 x 10–6  2.5 m

 A 3.24 x10 –7 m2

R= 11.57 Ohms ( )

