wire made of copper, for instance, heats up the tungsten wire and makes it glow.

Current, resistance, and voltage have a strong relationship. In 1826, Georg Ohm discovered that relationship. Here is Ohm's law:

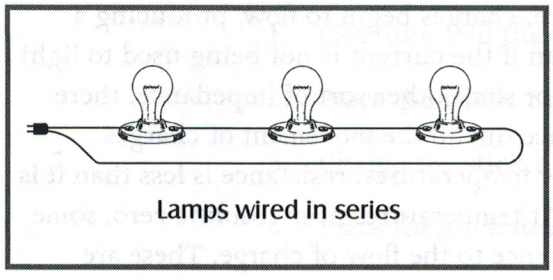
current = voltage/resistance or amperes = volts/ohms

Ohm's law tells us that a potential difference of 1 volt established across a circuit that has a resistance of 1 ohm will produce a current of 1 ampere.

Electric Power: Series and Parallel Circuits

The moving charges in an electrical current are capable of doing work—the work of lighting a lightbulb or toasting a piece of bread, for instance. The rate at which work is done is called *electric power*. Electric power is equal to the product of current and voltage.

Any path through which electrons can flow is a circuit. For a continuous flow of electrons to do work, there must be a complete circuit with no gaps in it. Gaps are usually provided, as switches, to cut off energy flow or to restore it. Most circuits have more than one device that receives energy. The devices are connected in a circuit in one or two ways: in **series** or in **parallel.**



Lamps wired in series

A series circuit has all of its components connected along a single conducting path. The same current passes through all of the resistors. If there is a break anywhere on the string, the circuit is broken. For instance, if you have a string of holiday lights, if one of the bulbs is out, does the entire string go dark? If so, the lights are wired in series.

In any series circuit, a single pathway passes through the entire circuit, so it must pass through each of the resistors. This means that the total resistance is the combined resistances of each device on the series. Remember that according to Ohm's law, the current in the circuit is equal to the voltage supplied by the source, divided by the total resistance of the circuit.

