



BACKGROUND

Current can be induced by decreasing the potential difference in the direction we wish the current to flow.

Electrical Currents and Circuits

Recall that voltage is the measurement of electric potential. Voltage actually acts like an electrical pressure that can produce a flow of charge, or **current**. Current is measured in amperes, which is generally abbreviated as amps. There is also a **resistance** to the flow of current, which is measured in ohms. When the flow of current is in one direction only—like from a battery—this is known as a direct current. When the flow of current moves back and forth, like the current in your electrical sockets at home, it is called an alternating current. The rate at which energy is transferred by a current is power, which is measured in watts.

Current flows from a higher potential to a lower one. Without a potential difference, no flow will occur, just as no heat flow occurs when two objects are the same temperature. Electric current cannot travel on its own. If there is no potential difference, there is no current. Current can be induced by decreasing the potential difference in the direction we wish the current to flow. For instance, a battery pulls electrons away, causing a lower potential in the direction in which the current is desired. This causes charges to move through a **circuit**.

When voltage is applied across a circuit, whether from a battery source or generator source, charges begin to flow, producing a current of electricity. Even if the current is not being used to light bulbs, or ring doorbells, or some other sort of impedance, there will still be some resistance due to the movement of charges through the wires. At low temperatures, resistance is less than it is at higher temperatures. At temperatures near absolute zero, some metals acquire zero resistance to the flow of charge. These are called *superconductors*. However, for most ordinary circumstances, resistance due to medium alone is part of the equation.

In addition to resistance due to medium, there may be many other forms of resistance along a particular circuit. Current may be used to light bulbs, cool refrigerators, and run computers. As the current enters the appliance, the current is squeezed. Narrowing a current to pass through a tiny tungsten wire from a much thicker