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Current Electricity

If two equally and oppositely charged bodies are connected by a metallic conductor such as a wire, the charges neutralize each other. This neutralization is accomplished by means of a flow of electrons through the conductor from the negatively charged body to the positively charged one. (In some branches of electrical engineering, electric current has been conventionally assumed to flow in the opposite direction, that is, from positive to negative.) In any continuous system of conductors, electrons will flow from the point of lowest potential to the point of highest potential. A system of this kind is called an electric current. The current flowing in a circuit is described as direct current (DC) if it flows continuously in one direction, and as alternating current (AC) if it flows alternately in either direction.

When an electric current flows through a wire, two important effects can be observed: the temperature of the wire is raised, and a magnet or a compass needle placed near the wire will be deflected, tending to point in a direction perpendicular to the wire. As the current flows, the electrons making up the current collide with the atoms of the conductor and give up energy, which appears in the form of heat. The amount of energy expended in an electric circuit is expressed in terms of the joule.