

# Forms of Energy

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## You need to know six major types of energy:

**Chemical** - Chemical energy is the energy that is trapped in the bonds of matter. Food is an example of chemical energy. It contains energy that is trapped within the chemical bonds of sugar. When animals eat plants or other animals this sugar that is stored inside of the plant or animal being eaten is passed along to the animal that is consuming the organism. While trapped inside of these sugar bonds, it is potential energy—it has the ability to do work or cause change. This sugar can be broken down by the organism to do work—hunt, reproduce, play, breathe, etc. When this happens, chemical energy is turned into kinetic energy.

**Light** - Light energy is electromagnetic energy that travels in waves and has photons. Electromagnetic energy ranges from radio waves to microwaves to infrared waves to visible light to UV waves. Most people think about this type of energy as being in the form of visible light. Light from the sun travels to earth through space, and there it is changed into heat energy. Light energy from the sun is also taken in by plants and turned into chemical energy—sugar (potential). Light energy also helps light our houses and buildings. For this to happen, coal is burned and turned into heat energy that turns water into steam. The steam produced turns turbines that produce an electrical charge that causes the filament in light bulbs to glow and emit light.

**Electrical** - Electrical energy is the flow of electrons. Electrons are negatively charged particles that are located outside an atom's nucleus and are used in chemical bonding. Humans can force electrons to flow through a conductor. When electrons flow through a conductor—metal such as copper—electrical energy has been generated. As discussed earlier, electrical energy can be generated through the burning of coal and also through the movement of water. In hydroelectric plants, water is released through a dam to turn turbines which in turn create a flow of electrons. Chemical energy can also be converted into electrical energy. An example of this would be batteries used to generate an electrical charge to run a mechanical toy or light a flashlight bulb.

**Nuclear** - Nuclear energy comes from the nucleus of atoms—most often Uranium atoms. Nuclear energy can be generated by breaking apart the nucleus of an atom to release energy. This is known as nuclear fission. Nuclear energy can also be generated by combining two nuclei of different atoms in a reaction known as nuclear fusion. An example of nuclear fission is nuclear power plants using uranium to generate electricity. An example of nuclear fusion is the reactions that take place within the sun.

**Thermal** - Thermal energy is also known as heat energy. Heat energy is generated through the movement or vibrations of molecules or particles that make up matter. The faster the molecules vibrate, the greater their thermal energy. Thermal energy can be generated when light energy causes air molecules to vibrate more vigorously causing their temperature to increase. Electrical energy can also be used to generate heat energy to cook and heat your home.

**Sound** - Sound energy is energy that is transmitted through matter in waves. The waves travel through matter and cause it to vibrate which produces sound. Thunder is an example of sound energy. Lightning heats up the air and it causes it to expand rapidly which in turn causes vibrations of the air molecules that we hear as thunder.