Potential Energy Encyclopedia Article

Potential Energy

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Potential Energy

Matter may store **energy** even when at rest. Energy that is stored and held for future use is referred to as potential energy. If this is confusing, recall that energy is the capacity to do work, regardless of whether that energy involves motion (kinetic energy) or not (potential energy).

The most familiar form of potential energy involves the pull of Earth's gravity. The law of **conservation of energy** tells us that a boulder at rest on the edge of a cliff has potential energy in an amount equal to the amount of work it took to raise the boulder to that height from ground level. (Mathematically, the work done in lifting an object is equal to the weight of the object times the distance it is raised.)

But Earth's gravity is not required for the existence of potential energy. An example of an object containing nongravitational potential energy is a stretched bow. When one draws the bowstring, the energy required to stretch it is transferred into the bow. Neptune has potential energy because it can expend energy by falling into the Sun due to the Sun's gravitational pull. Moreover, a nail within the magnetic field of a magnet has potential energy because it can expend energy by moving toward the magnet.

The chemical energy in fossil fuel, for example, is a form of potential energy. This energy is converted to kinetic energy when a chemical change takes place in the material. There is also potential energy in electric **batteries**, wound alarmclocks, and in the food we eat.