

26.3: Other Forms of Energy

The sum of the kinetic and potential energies is called the mechanical energy:

$$\text{M.E.} = K + U. \quad (26.3.1)$$

Energy can occur in a number of other forms besides kinetic and potential. For example:

- Thermal energy is the energy of heat.
- Acoustic energy is the energy of sound.
- Electromagnetic energy is radiant light energy.
- Mass energy. Einstein showed that mass itself can be converted directly into energy, the clearest illustration being the mutual annihilation of matter and antimatter. If a mass m is converted entirely into energy, the amount of energy produced is given by Einstein's famous equation,

$$E_0 = mc^2, \quad (26.3.2)$$

where E_0 is the mass energy and c is the speed of light in vacuum.

Energy can be converted from one form to another. For example, if you hold an object a height h above the floor, its energy is all potential. When you release it, its energy is converted little by little from potential to kinetic as it falls. By the time the object is about to hit the ground, all of its potential energy has been converted to kinetic energy. After it hits the ground, all of that kinetic energy has been converted to thermal energy (causing both the floor and the object to get hotter) and acoustic energy (you can hear the sound of the object hitting the floor).

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