energy

name _____
class ____ team ___
seat ___ date ___

ENERGY is the ability to do work. It is inherent in all matter. The energy of matter in motion is called kinetic energy.

The energy of matter at rest is called potential energy, that is, the capacity to do work is stored. The wind, running water, a ball moving through the air, and an automobile in motion are all examples of kinetic energy. Energy stored in coal or in oil, in the water behind a dam, or in a tightly wound watch spring is potential energy, and under the right conditions it can be changed into kinetic energy. For example, the potential energy of the watch spring is changed into kinetic energy as the watch runs.

There are many different kinds of energy; some are mechanical energy, electrical energy, radiant energy, heat energy, and atomic (or nuclear) energy. The many forms of energy are interchangeable. The radiant energy from sunlight is used by plants to make food, which is chemical energy. When eaten, the food is converted by the body into heat energy, mechanical energy, and electrical energy. With these various forms of energy we are able to maintain life and do work.

The sun's energy comes from transformations within its atoms. By learning how to make similar transformations in atoms, man has produced a new source of energy, that is, atomic energy.

ENERGY, CONSERVATION OF, the principle that energy cannot be created or destroyed, sometimes called the first law of thermodynamics. According to this principle the total quantity of energy within a system remains the same even when energy changes from one form into another, as long as no energy is added from outside the system or withdrawn. Part of the mechanical energy applied in braking a wheel, for instance, is converted into heat energy, which dissipates into the air. This dissipated energy, however, is not destroyed but remains part of the total energy system of the earth and its atmosphere.

The law of conservation of energy was first announced in general terms by Hermann Helmholtz in 1847. It is recognized as one of the great scientific generalizations of the 19th century and occupies an equal place beside the law of conservation of mass, which was developed late in the preceding century. However, according to the special theory of relativity published early in the 20th century mass and energy can be converted into one another. The law accommodating this discovery is called the law of conservation of mass-energy. But where no conversion between mass and energy is involved, the law of conservation of energy remains true.

What did Hermann Helmholtz say about energy?

How can potential energy become kinetic energy?

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