

## Study Guide for C5 Energy

Name: \_\_\_\_\_

Equations:  $K.E = \frac{1}{2} mv^2$ ;  $G.P.E. = W \times h$ , or  $G.P.E. = mgh$ ;  $M.E. = P.E. + K.E.$

All types of energy are measured in SI units of Joules

Energy is the ability to do work, or what allows work to be done. Work is the transfer of energy.

There are several types of energy. Energy can change from one form to another. This is known as energy conversion. Note that whenever one form of energy converts into another, some of the original energy is always converted to thermal energy.

Kinetic energy, (K.E.), is the energy of motion. Any object with mass that is moving has kinetic energy.

Potential energy is the stored energy an object has due to its position.

There are several types of potential energy including:

Gravitational potential energy, (G.P.E.) – this is the energy you give an object when you raise it upward against a gravitational force, such that it is higher than it was initially.

Elastic potential energy – the energy stored in a stretched or twisted rubber band, elastic chord, spring or bow.

Chemical potential energy – the energy stored in chemical compounds such as food, fossil fuels, batteries, explosives, etc.

Nuclear potential energy – the energy stored in the nucleus of atoms. When changes in the atom's nucleus occur, the energy can be released. Such as nuclear fission, when a larger nucleus splits into smaller nuclei; or nuclear fusion, when two smaller nuclei fuse into a larger nucleus.

Other types of energy: Thermal energy (heat), Sound energy, Light energy

Mechanical Energy (M.E.) is the sum total of potential and kinetic energy.

The law of conservation of energy states that energy cannot be created nor destroyed.

A roller coaster has the maximum potential energy at the top of the highest hill, and the maximum kinetic energy at the bottom of the lowest point. Because of friction on a roller coaster, some of the initial potential energy is not converted into kinetic energy.

A hair dryer changes electrical energy to thermal energy

The body converts the chemical energy of food into kinetic and thermal energy.

An electric generator converts kinetic energy into electrical energy.

Fossil fuels are considered nonrenewable resources; wind and solar are considered renewable.