

## Physics 10 vocabulary

System- anything that is under observation and can be looked separately from surroundings

Surroundings- anything that is not a part of the system but the system can have an effect upon

Kinetic energy- the energy of motion

- Mechanical kinetic energy- this is the energy of motion of objects that are larger than atoms and molecules. ANY object that is moving has mechanical potential energy.
- Radiant energy- it is the energy of electromagnetic waves that travel or "radiate" from an energy source
- Thermal energy- it is the energy of the random motion of the particles that make up a substance. Particles of warmer objects move faster than those of cooler objects.
- Electrical kinetic energy- this is the energy of electrons moving along a wire or other conductor. For ex, lightning is a form of electrical kinetic energy, where the air acts as the conductor.
- Sound energy- sound is the energy of vibrations or disturbances of the particles that make up matter. It travels through substances as a pressure wave. As the wave passes through a substance, its particles vibrate back and forth, colliding with nearby particles

Potential energy- the stored energy of an object as a result of its condition or its position

- Chemical potential energy- this energy is stored in chemical bonds
- Elastic potential energy- this energy is stored in a stretched or compressed object. It applies to ANY object like the soles of your shoes when you walk.
- Gravitational potential energy- this energy is due to the position of an object relative to a reference point, such as the ground
- Nuclear energy- this energy is stored within the nucleus of an atom. Nuclear processes can release an enormous amount of energy
- Electrical potential energy- this energy is stored by a separation of positive and negative charges, as it is in a cell or battery
- Magnetic potential energy- if you prevent a compass needle from moving, it has this energy as it otherwise has the potential to move

Law of conservation of energy- law stating that energy is neither created nor destroyed, but is transformed from one form energy to another or transferred from one object to another

Types of systems- each type of system is described in terms of the transformation of energy and the transfer of both energy and matter

- An open system can exchange both energy and matter with its surroundings
- A closed system can exchange energy, but not matter, with its surroundings
- An isolated system cannot exchange energy or matter with its surroundings

The mechanical kinetic energy formula shows the mathematical relationship between an object's mechanical kinetic energy and its mass and velocity. The term velocity refers to the speed that something is moving in a specific direction.

$$E_k = \frac{1}{2}mv^2$$

Mechanical kinetic energy	$E_k$	J (joule)
mass	$m$	Kg (kilogram)
Velocity*	$v$	m/s (metres per second)

\*velocity is squared in the calculations for mechanical kinetic energy

The gravitational potential energy formula shows the mathematical relationship between an object's gravitational potential energy and its mass, the acceleration due to gravity (9.8m/s\*), and the change in height.

$$E_g = mgh$$

Quantity

symbol

SI unit

Gravitational potential energy	$E_g$	J (joule)
mass	$m$	Kg (kilogram)
Acceleration due to gravity	$g$	m/s <sup>2</sup> (metres per second squared)
Change in height (from reference position)	$h$	m (metre)