ENERGY STORES

KINETIC ENERGY

Kinetic energy is the energy an object possesses due to its motion. The faster an object moves, the more kinetic energy it has. You can calculate kinetic energy using the equation:

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

Energy is transferred to an object's kinetic store when work is done on it, like pushing a ball to set it rolling.

m = mass(kg), v = velocity (m/s)

GRAVITATIONAL POTENTIAL ENERGY

Potential energy is the energy stored in an object because of its position or arrangement. The most common type is gravitational potential energy, which increases when an object is raised higher above the ground. You can calculate it using the equation:

$$PE = m \cdot g \cdot h$$

Energy is transferred to the potential energy store when an object is lifted against gravity.

m = mass(kg), h=height (m)
g = acceleration of gravity (m/s^2)

ELASTIC POTENTIAL ENERGY

Elastic potential energy is the energy stored in a material, like a spring or rubber band, when it is stretched or compressed.
The amount of elastic potential energy stored can be calculated using the equation:

$$EPE = \frac{1}{2}kx^2$$

Examples of elastic potential energy applications include the energy stored in a bowstring when drawn back or in a spring-loaded toy when compressed.

k = spring constant (N/m), x =spring extension (m)

ENERGY TRANSFER

Energy transfer occurs when energy moves from one place or object to another.

A bouncing ball shows how these energy stores work together:
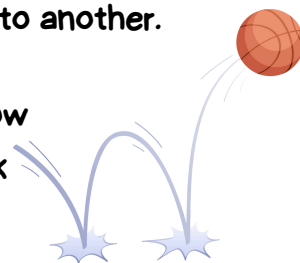
When a ball is at its highest point, it has the most gravitational potential energy. As it falls, this energy becomes kinetic. Upon bouncing, some kinetic energy turns into elastic potential energy before the ball rebounds, turning back into kinetic and then gravitational potential energy as it rises again.