

KE and PE_g Transformations

Potential Energy, PE

Energy stored in an object.

Gravitational Potential Energy, PE_g

The energy stored in an object as a result of an object's position relative to a "zero" point.

Work has to be done by a force to lift an object to a certain height; this **work stores energy as gravitational potential energy**.

ex.

A 50 kg girl climbs a 3 m high staircase, what is the gravitational potential energy at the top of the stairs?

ex.

An 800 kg car goes up a 40 m hill and then down a 100 m hill, what is its change in gravitational potential energy?

Total Energy

The total energy of an object is the sum of all the types of energy the object possesses at one time.

The Law of Conservation of Energy

Energy may change forms, but it cannot be created or destroyed.
(The total amount of energy in a closed system is constant.)

We can apply the law of conservation of energy to kinetic energy and potential energy transformations.

ex.

What velocity will a 2 kg mass have when it strikes the ground if it is dropped from 15 m?

ex.

A 0.25 kg ball is thrown vertically upward from the roof of an 18 m high building with a speed of 16 m/s, and just misses the building on the way down.

a.) What vertical height does the ball rise above the ground?

b.) With what velocity does the ball strike the ground?

ex.

What velocity will an object hit the ground at if it is dropped from 9 m?