Types of Energy and The Law of Conservation of Energy

Observe page 236 - review types of energy.

Application/Example

mechanical
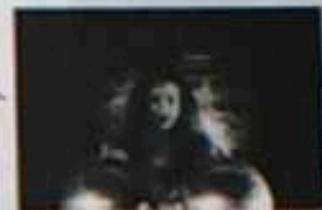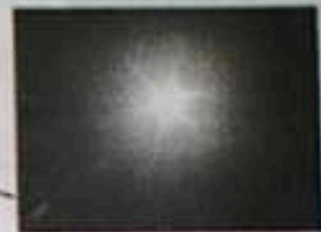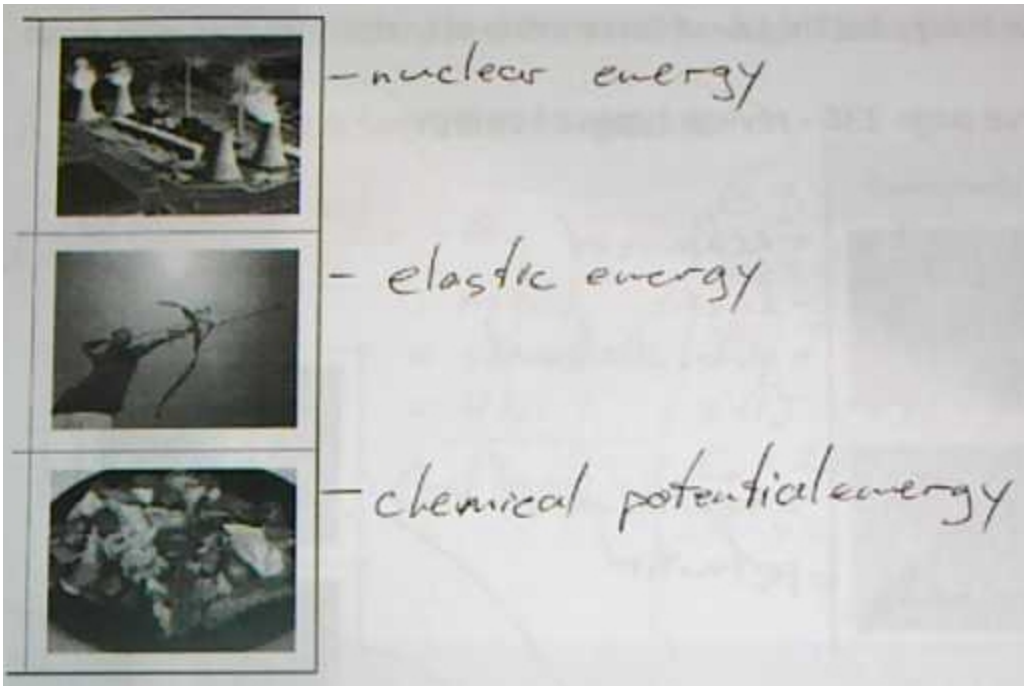- kinetic
- gravitational

- gravitational
  potential

radiant energy

static electrical
  energy

electric current
  energy

thermal energy

sound energy

- nuclear energy

- elastic energy

- chemical potential energy

Energy is transformed from type to type quite often … review types of transformation.

The Law of Conservation of Energy:

The total amount of energy in the universe is conserved. There is a certain total amount of energy in the universe, and this total never changes. New energy cannot be created out of nothing, and existing energy cannot disappear; the energy that exists can only be changed from one form into another. When an energy transformation occurs, no energy is lost.

SPH3U0 - Mechanical Energy Conservation Examples

Eg: A 5kg shot put is dropped from the 9m high roof of the school.

… E at start … E at 4.5m … E at the ground.

You try:

Practice

1. A 0.20 kg ball is thrown straight up from the edge of a 30.0 m tall building at a velocity of 22.0 m/s. The ball moves up to the maximum height and then falls to the ground at the base of the building. Use the law of conservation of energy to answer the following questions, assuming that the reference level for gravitational potential energy is ground level. T/I
   (a) What is the total energy of the ball at the start when it had a velocity of 22.0 m/s? [ans: 110 J]
   (b) What is the velocity of the ball at the maximum height? What is the maximum height of the ball? [ans: 0 m/s [up], 55 m]
   (c) What is the velocity of the ball when it hits the ground? [ans: 33 m/s [down]]

Assuming the 500kg roller coaster in the following situation operates with no energy loss due to friction and reaches position A with an initial velocity of 0m/s, calculate the potential energy, kinetic energy, and total energy at each of the different locations (complete the following table). Calculate the final velocity.

A

C

B

10m

7.5m

5m

D

0m
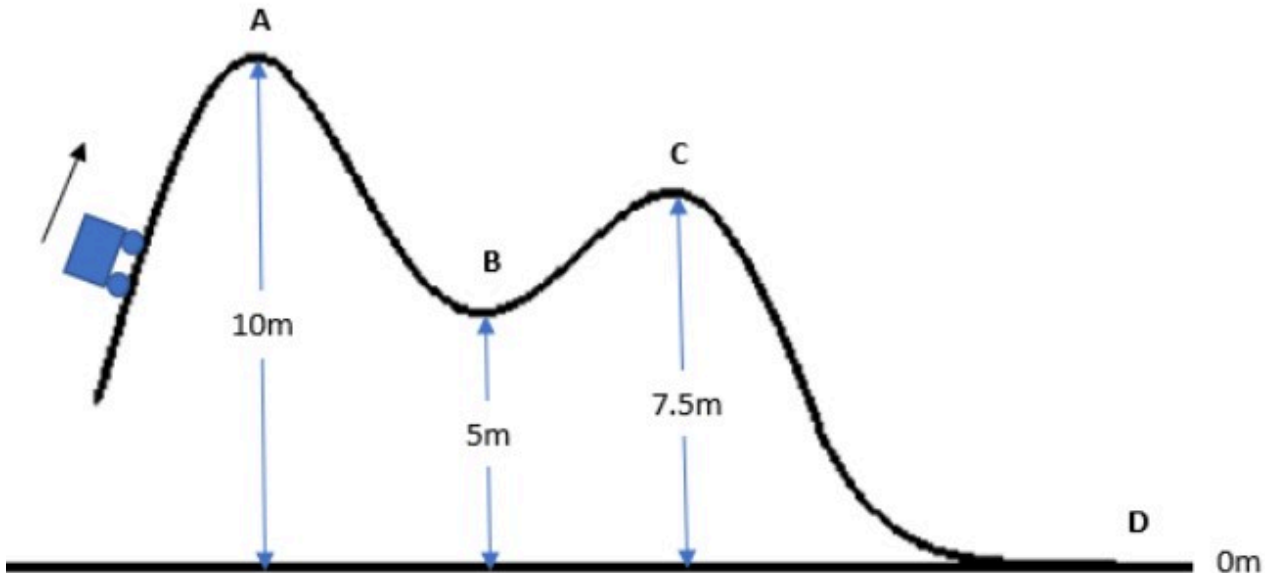
Position	Potential Energy (E$_g$)	Kinetic Energy (E$_k$)	Total Energy (E$_T$)
A			
B			
C			
D			

HW: page 241, #2-4