

U1L1 WHAT IS ENERGY?

KEY CONCEPTS:

- How are energy, work and power related?
- What are the two basic kinds of energy

KEY TERMS:

- Energy * Kinetic Energy * Potential Energy
- Gravitational Potential Energy
- Elastic Potential Energy

Page 5 in book Questions 1 and 2



I. ENERGY, WORK AND POWER

**A. Remember work is done when a force moves
and object a distance.**

**B. Energy = definition – the ability to do work or
cause change**



Think about a wind up toy. The user Winds up the coil inside the toy. The Energy of the coil is released as it Unwinds, exerting a force on the gears That cause it to move.

II. WORK AND ENERGY

- A. When an object does work some of its energy is transferred to that object.**
- B. Work is the transfer of energy and measured in joules.**

II. WORK AND ENERGY

C. Work (W) can be calculated using the formula

$W = Fd$ where F is the force applied to the

Object and d is the distance the object moves.

It is also called Joules (J)

D. Force is in units of Newtons (N) and distance is in meters or Newtons X Meters.

III. POWER AND ENERGY

A. Power is the rate at which work is done.

B. If the transfer of energy is work, then power is the rate at which energy is transferred, or the amount of energy transferred in a unit of time

IV.KINETIC ENERGY

A. Two basic kinds of energy are kinetic energy and potential energy

B. Kinetic Energy = definition – the energy an object has due to its motion.

C. The word kinetic comes from the Greek word kinetos which means “moving”

V. FACTORS AFFECTING KINETIC ENERGY

- A. The kinetic energy of an object depends on its mass and its velocity. Kinetic energy increases as mass increases. Ex. A bowling ball rolled versus a golf ball.
- B. It also increases when also when velocity increases Ex. Two identical bowling balls, one thrown harder than the other.

VI. FORMS OF KINETIC ENERGY-

A. MECHANICAL ENERGY - the sum of the object's potential and kinetic energy or the energy of an object due to its motion and its position.

Mechanical Energy

Energy that can be used to do work.

It is the sum of an object's kinetic and potential energy.

Examples: elevator,
Car, hammer in motion



VI. FORMS OF KINETIC ENERGY- Cont'd

B. Copy the different **types of energy** see page 10

VII. ENERGY IN SYSTEMS

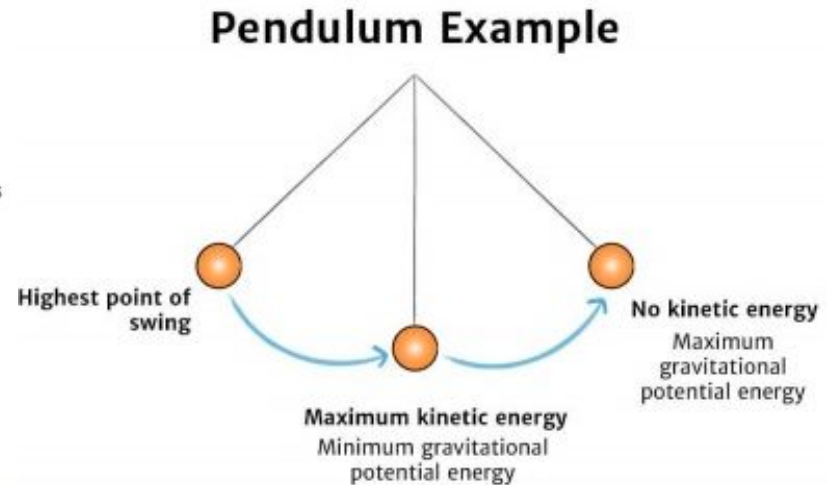
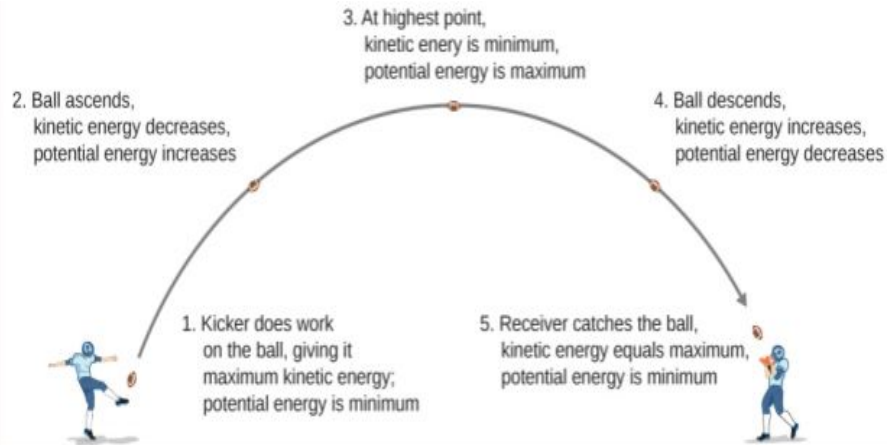
A. System - is a group of interacting parts that move together or work together and needs energy.

B. Energy in the system can be transferred or transformed

VIII. Potential Energy - definition an object has stored energy based on its relative position within a system

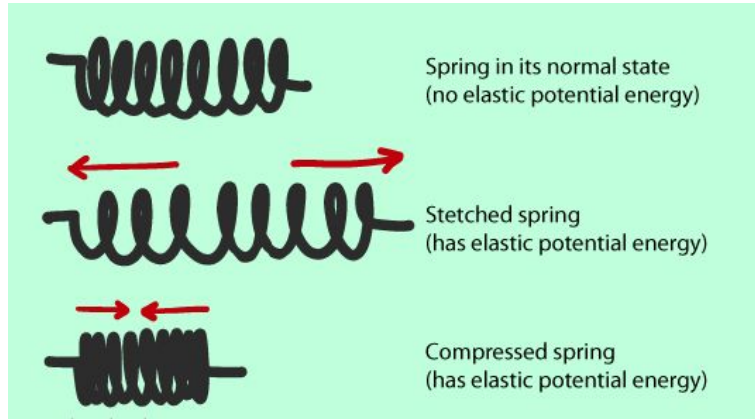
VIII. FORMS OF POTENTIAL ENERGY

A. **GRAVITATIONAL POTENTIAL ENERGY** the energy a physical object with mass has in relation to another massive object due to gravity. It is potential energy associated with the gravitational field. Gravitational energy is dependent on the masses of two bodies, their distance apart and the gravitational constant



VIII. FORMS OF POTENTIAL ENERGY (Cont'd)

B. Elastic Potential Energy = the energy associated with an object that can be stretched or compressed. Ex When an archer pulls back an arrow the bow changes shape and has an elastic potential energy.



VIII. FORMS OF POTENTIAL ENERGY- Cont'd

C. The various types of potential energy

include:

- Gravitational **PE**
- Elastic **PE**
- Nuclear **PE.**
- Chemical **PE.**
- Electric **PE.**

