

# **THE NATURE OF ENERGY**

**TYPES OF KINETIC AND POTENTIAL ENERGY**

# QUESTION:

- What's the different between kinetic and potential energy?

# ENERGY

- The ability to cause change
- Some forms of energy include:
  - Electrical
  - Chemical
  - Thermal
  - Radiant

# KINETIC ENERGY

- energy in the form of motion
- KE depends on mass and speed of the moving object
- Example of KE: going down a slide



# POTENTIAL ENERGY

- Energy that is stored
- Example of PE: waiting at the top of the slide



# DIFFERENT TYPES OF POTENTIAL ENERGY

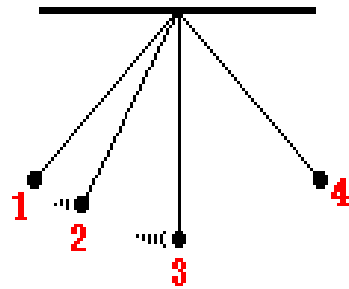
- Elastic Potential Energy (EPE): energy stored by something that can stretch or compress
  - Examples: rubber band, spring
- Chemical Potential Energy (CPE): energy stored in chemical bonds
  - Example: a glass of milk has CPE until you drink it then calories are used as energy for your body
- Gravitational Potential Energy (GPE): anything that can fall has stored GPE
  - Example: a rock on a ledge



# MECHANICAL ENERGY

- ME is the total amount of kinetic energy and potential energy in a system

$$\text{Mechanical Energy} = \text{PE} + \text{KE}$$



**Position 1**

**PE = 6 J**

**KE = 0 J**

**Position 2**

**PE = 3 J**

**KE = 3 J**

**Position 3**

**PE = 0 J**

**KE = 6 J**

**Position 4**

**PE = 6 J**

**KE = 0 J**

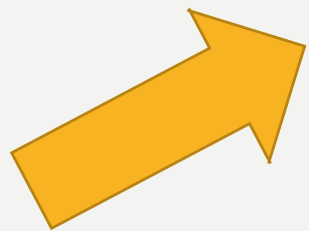
# CONSERVATION OF ENERGY

Just like matter can not be created or destroyed, energy can only be transformed from one form to another

Ex:



Electrical energy



Light Energy



Thermal Energy



# THE LAW OF CONSERVATION OF ENERGY

- Energy may change form, but it cannot be created or destroyed under ordinary conditions.

Example: When you are swinging on a swing, the breakfast you ate converts its chemical energy into mechanical energy. ME becomes heat energy so your muscles can help you pump your legs. As you go through the air, air resistance converts ME into thermal energy. The friction of the chain on the top bar converts ME into thermal energy.

