

For today, let us...

- discuss the law of conservation of mechanical energy
- recall relevant concepts like work and conservative/non-conservative forces
- define power
- solve a simple exercise on conservation of mechanical energy and power

CONSERVATION LAWS

One of the greatest & most powerful achievements in science

LAW OF CONSERVATION OF ENERGY

The total energy of a system remains the same.

Although energy may be changed from one form to another, it cannot be created nor destroyed.

CONSERVATION OF MECHANICAL ENERGY

If all the forces on a system are conservative, the mechanical energy of the system remains the same.

"Memory recall" on energy

$$ME = KE + PE$$

$$KE = \frac{1}{2} (mv^2)$$

$$PE_g = mgh$$

$$PE_{elas} = \frac{1}{2} kx^2$$

Unit: Joule (J)

For today, let us...

recall the simple exercise on conservation of mechanical energy

define power

recall the concept of work

solve a simple exercise on power

Simple Equations

$$\Delta ME = 0$$

$$\Delta KE + \Delta PE = 0$$

$$+ \Delta KE = - \Delta PE$$

$$+ \Delta PE = - \Delta KE$$

POWER

-Rate at which energy is changed

-Rate at which work is done

$$P = \frac{\text{work}}{\text{time}}$$

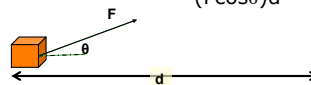
UNIT: 1 WATT (W) = 1 J/s

WORK

$$W = Fd \cos \theta$$

(constant force)

$$(F \cos \theta) d$$



UNIT: 1 Joule (J) = 1 N•m

Work – Mode of energy transfer