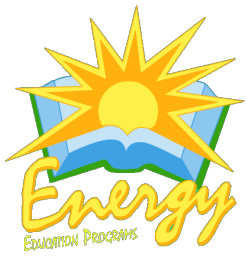
# Energy

## Objectives

Identify types of energy

Define & calculate potential and kinetic energy

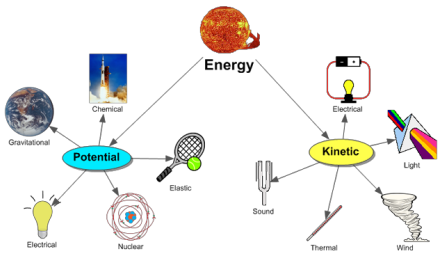
Use conservation of mechanical energy to solve for velocity




## Energy

drives all processes in all parts of Physics!

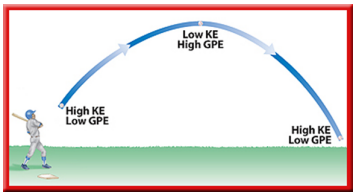
the thing that enables us to do work = energy




## Mechanical Energy

energy of position and motion in a system

Mechanical Energy = PE + KE




## Kinetic Energy

energy of motion

$$KE = \frac{1}{2} m \cdot v^2$$

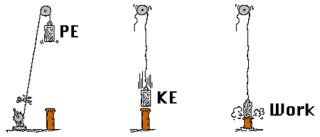
Unit: Joules (J)


## Potential Energy

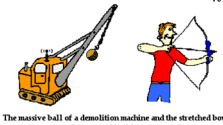
energy of position

**PE = mgh**

Unit: Joules (J)




The ram of a pile-driver possesses mechanical energy – the ability to do work. When held at a height, it possesses mechanical energy in the form of potential energy. As it falls it possesses mechanical energy in the form of kinetic energy. As it strikes the spike, it applies a force to displace the spike – i.e., it does work on the spike.

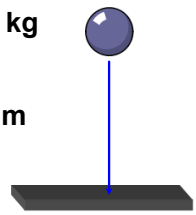


The massive ball of a demolition machine and the stretched bow possesses stored energy of position - potential energy.

## Potential Energy

**m = .1 kg**

**h = .2 m**



PE = mgh

= (.1 kg)(10 m/s²)(.2 m)

= .2 J

## Conservation of Mechanical Energy

total energy is constant

BUT energy is transferred between forms (PE & KE)

$$PE_1 + KE_1 = PE_2 + KE_2$$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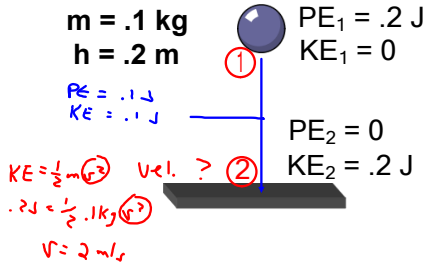
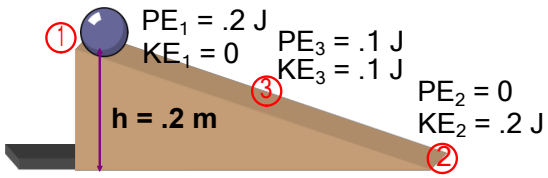
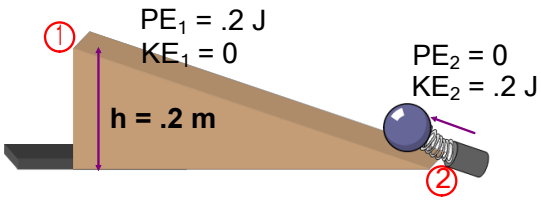
## Conservation of Mechanical Energy



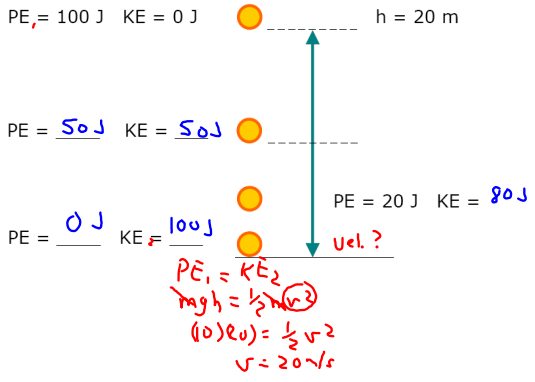

## Conservation of Mechanical Energy




## Conservation of Mechanical Energy




## Conservation of Mechanical Energy




## Assignments . . .

- Begin Chapter 7 Homework # 13 - 17

## Attachments

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