

## 9-4: Energy Conversion & Conservation

### I. Conversions between energy forms

1) Flashlight - Chemical Energy in batteries  $\rightarrow$  Electrical En.  $\rightarrow$  Light and Heat Energy (Thermal)

2) Match - Ch. En. in tip + Mechanical En. of striking  $\rightarrow$  Light and Heat En.

3) Marble Down Ruler - GPE  $\rightarrow$  KE + Thermal En. from friction

### II. Conservation of Energy

A. "When energy is converted (transformed) from one type to another, no energy is gained or lost." } TE Stays Constant

### B. Energy & Friction

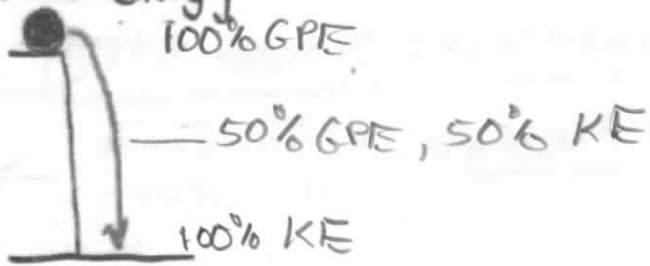
- Moving objects experience Friction

So some of the KE will be turned into Thermal Energy, Sound, etc.

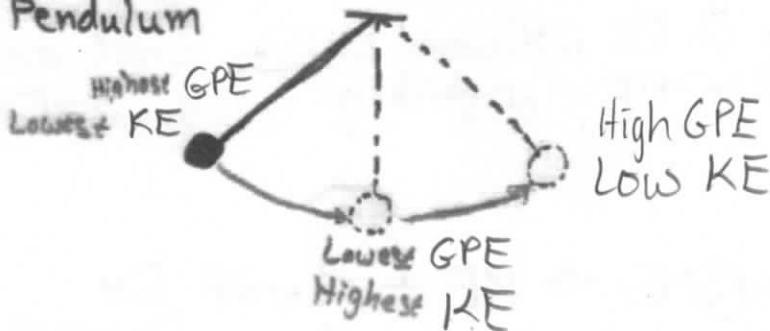
## C. Kinetic & Potential Energy

- A common change of energy

- A falling Ball



- Pendulum



Eg. 9-7

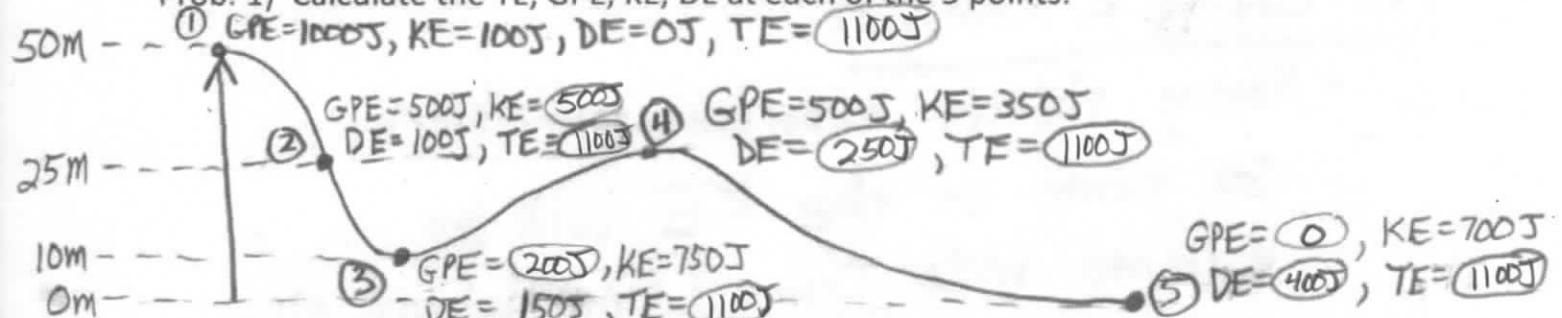
$$\text{Mechanical Energy} = \text{GPE} + \text{KE}$$

Eq. 9-8 Total Energy = GPE + KE + Dissipated Energy

Heat, sound, etc

$$\text{Total Energy} = \text{GPE} + \text{KE} + \text{DE}$$

Prob. 1) Calculate the TE, GPE, KE, DE at each of the 5 points.



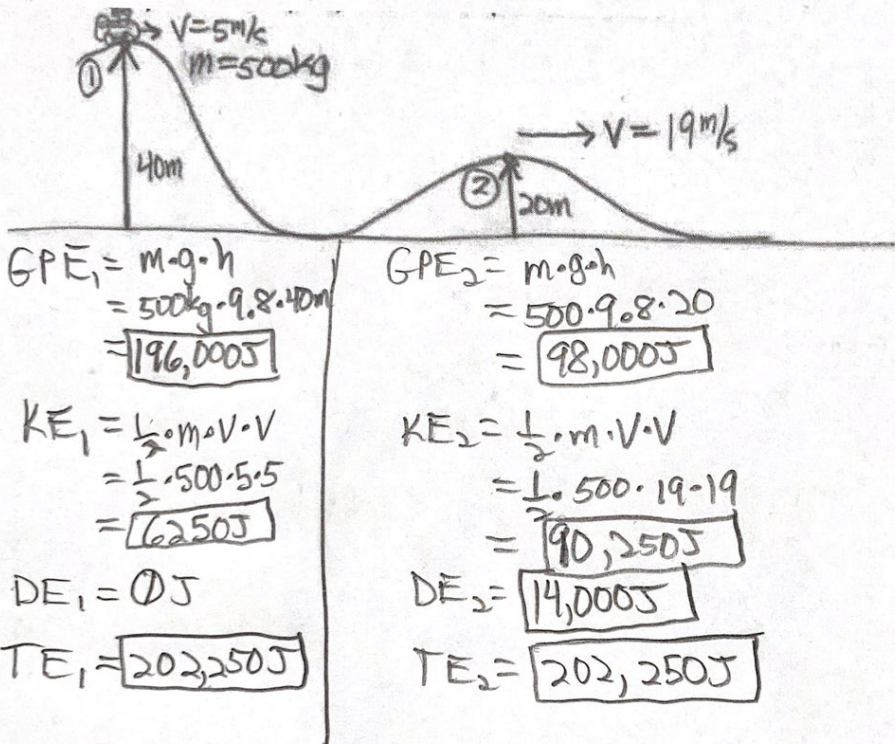
What Energy consistently increased?

DE

What En. did not change?

TE

Prob. 2) Calc. GPE, KE, TE, and DE at points 1 and 2



How much DE was there between points 1 and 2?  $14,000\text{J}$

What was this cause of this Dissipated Energy?  $\text{Friction}$