CONCEPT: CONSERVATION OF ENERGY EQUATION WITH NON-CONSERVATIVE FORCES

Conservative Forces		Non-Conservative Forces	
Gravity	Springs	Applied	Friction

● If NON-conservative forces do work (W_{NC} __ **0**), Mech. Energy is _____ conserved.

- However, still use the **Conservation of Energy** equation to solve these problems!

$$K_i + U_i + \_\_\_\_\_ = K_f + U_f$$

(Conservation of Energy)

$$W_{NC} = \_\_\_\_\_$$

- W_{NC} is simply the _____ of work done by any applied forces + friction.

EXAMPLE: A 0.5 kg hockey puck is initially moving along the smooth ice at 4m/s. Using your hockey stick, you push the puck with a constant 200N through a distance of 0.3m. Calculate the puck's final speed.

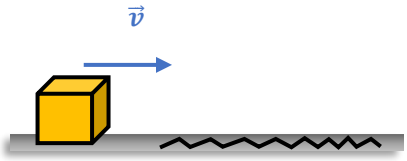
CONSERVATION OF ENERGY

1) Draw Diagram
2) Write Cons. of Energy EQ
3) Eliminate & expand terms
4) Solve

WORK & ENERGY

$W = Fd\cos\theta$
$W_{F_A} = F_A d\cos\theta$
$W_{f_k} = -f_k d$

PROBLEM: A block of unknown mass is sliding along a flat surface with 30m/s when it enters a long, rough patch. If the coefficient of friction between the block and the floor is 0.6, calculate the distance the block travels before stopping.



CONSERVATION OF ENERGY

1) Draw Diagram
2) Write Cons. of Energy EQ
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- Whenever **M.E.** isn't conserved, $\mathbf{W_{NC}}$ always makes up the difference. $\mathbf{W_{NC}}$ = energy added/removed from system

PROBLEM: An 800kg car skids to a stop from 30m/s through a distance of 90m. Calculate the coefficient of friction between the car and the road.

CONSERVATION OF ENERGY
1) Draw Diagram **2)** Write Cons. of Energy EQ **3)** Eliminate & expand terms **4)** Solve

PROBLEM: A 2-kg object dropped from a height of 80m reaches the floor with 30m/s. Using Energy Conservation, calculate **a)** the amount of work done by air resistance, and **b)** the *average* force of air resistance.

CONSERVATION OF ENERGY
1) Draw Diagram **2)** Write Cons. of Energy EQ **3)** Eliminate & expand terms **4)** Solve

● We can use Energy Conservation to solve problems with "resistive" forces like air/water resistance, which act like friction!