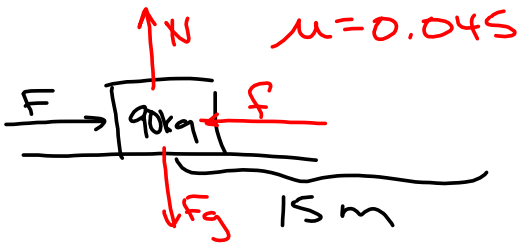
Homework Questions

1.



$F = f$

3.

$W = F_{\parallel} d = F_x d$

$= (250N \cos 35°)(500m)$

$= 1.03 \times 10^5 J$

Energy

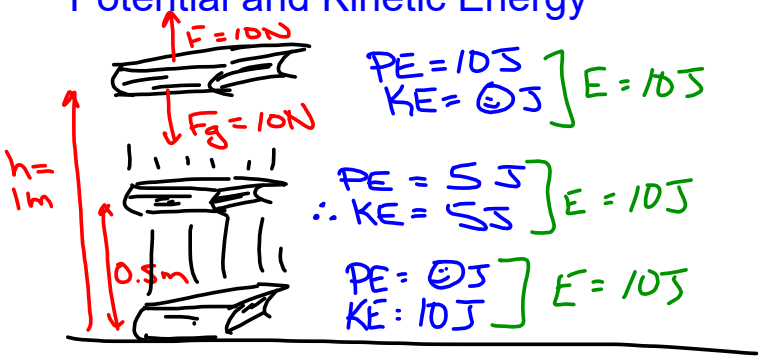
Potential Energy - energy stored in an object

Several types → gravitational PE
electrical PE
magnetic PE
chemical PE
:

Kinetic Energy (KE) - energy of motion
- dependent on mass and speed.

Both PE and KE provide the ability to do work.

Potential and Kinetic Energy



$W = Fd$
$= 10N(1m)$
$= 10J$

$F = F_g = mg$

$W = Fd$ h = height
$= mgh = PE$

$PE_g = mgh$ near surface of Earth

↑ gravitational potential energy

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

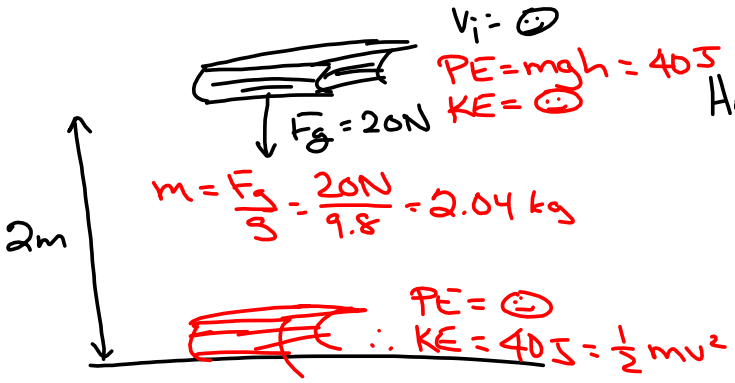
Conservation of Energy

The total energy in an isolated system remains constant regardless of the interactions that take place within the system. → forces / collisions

System - group of objects

open systems (anything in or out)
closed systems (no matter in or out) ← Cons. of $\vec{p}$
isolated systems (no energy in or out)

No ΣF acting on the group of objects. No heat in/out. No light in/out.



$m = \frac{F_g}{g} = \frac{20N}{9.8} = 2.04\ kg$

$40 = \frac{1}{2}(2.04kg)v^2$

$v = 6.3\ m/s$

How fast is the book moving at the moment it hits the ground?

$v_f^2 = v_i^2 + 2ad$

$= 2(-9.8\ m/s^2)(-2m)$

$v_f = -6.3\ m/s$

Homework #4, 7, 8, 10 on sheet. Chapter 6.2, 6.3