CONCEPT: GRAVITATIONAL POTENTIAL ENERGY

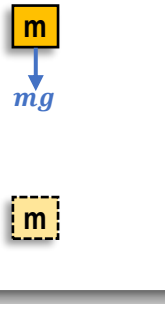
Mechanical Energy		
Kinetic	Potential	
	Elastic	Gravitational

● As objects fall, gravity does WORK on them and they fall *faster* (v __, KE __).

● This Energy must come from ***somewhere.*** KE is **transferred** from another *type* of Energy called _____.

- Gravitational POTENTIAL Energy ($\mathbf{U_g}$) is "_____" energy due to an object's _____: U_g = _____

EXAMPLE**:** You drop a 5.1kg box from 10m, and it falls to a height of 4m**. (a)** Calculate the initial Gravitational Potential Energy**. (b)** Calculate the final Gravitational Potential Energy**. (c)** Find the change in Gravitational Potential Energy**.**



$W_g = -mg\Delta y$

ΔU_g = _____

W_g = _____

● The WORK done by Gravity is the _____ in Gravitational Potential Energy**!**

IF no other forces are acting:

- As objects *FALL*, W_g is **[+ | –]**, KE **[INCREASES | DECREASES]**, U_g **[INCREASES | DECREASES]**
- As objects *RISE*, W_g is **[+ | –]**, KE **[INCREASES | DECREASES]**, U_g **[INCREASES | DECREASES]**

PROBLEM**:** A 2-kg ball initially 6m above the ground falls to a height of 3m**. a)** Calculate the change in Grav**.** Potential Energy if you choose the ground (y=0) to be where $U_g = 0$**. b)** Calculate the change in Grav**.** Potential Energy if you choose y = 6 to be where $U_g = 0$**.**

GRAV. POT. ENERGY
$W_g = -mg\Delta y = -\Delta U_g$
$U_g = mgy$
$\Delta U_g = mg\Delta y$

- In Energy problems, Grav. Potential Energy is always calculated ***relative*** to an arbitrary reference point**.**
  - When calculating ΔU_G, only the _____ in height is important, not the initial or final height**!**
  - If you know $\boldsymbol{\Delta y}$, you can set the "ground level" ($\mathbf{U_g =}$ __) wherever, but usually pick the *lowest point* of the problem**.**