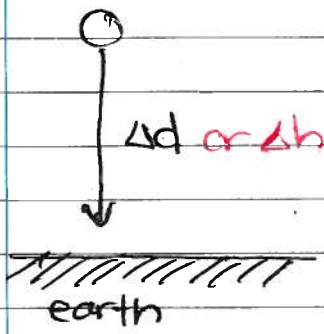
Nov 5, 2012

Gravitational Potential Energy

→ Last time: Kinetic Energy → moving objects can do work

• objects that are lifted in the air can do work as well!

Consider



$W = F \cdot \Delta d$

what force does the work? Gravity!

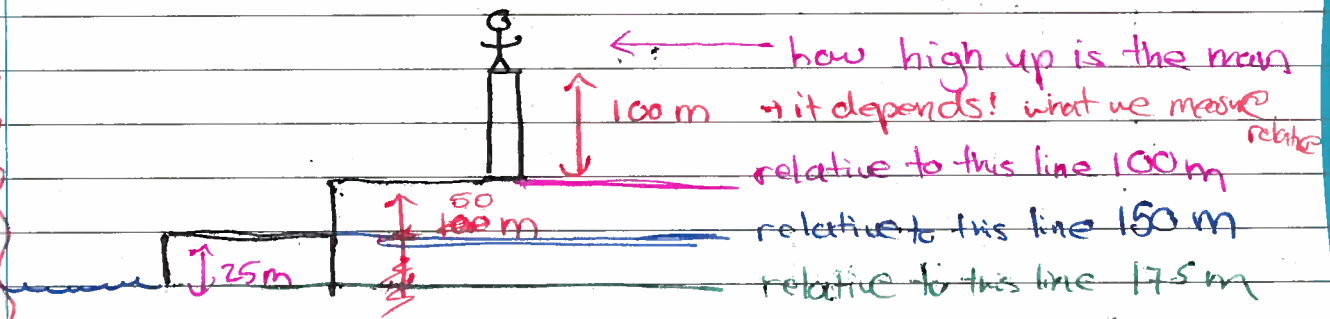
$F = F_g = mg$

→ our Δd is also called the height Δh above the earth's surface

$W = F \cdot \Delta d = mg\Delta h = mgh_2 - mgh_1$

→ we set $h_1 = 0$ [why?]

Side-note



* this is significant! * we must always set a reference level [a good rule of thumb is the lowest point]

$W = \Delta E_g = mgh_2 - mgh_1$

E_2 E_1

usually we set this equal to zero

$E_g = mgh$

Side note $(kg)\left(\frac{m}{s^2}\right)(m)$

units $m = kg$ $g = 9.8\ m/s^2$ $h = m$

↑ keep in mind this is not absolute gravitational potential energy

Units

E_g
- units of J

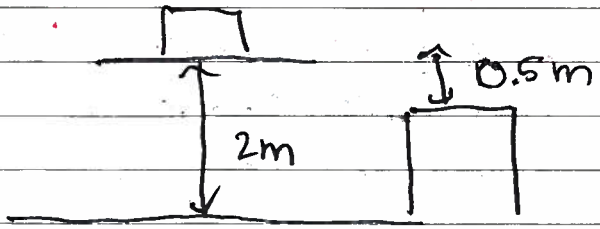
mgh
$(kg)\left(\frac{m}{s^2}\right) \cdot m$

$N \cdot m = J$

Sample problem 1

What is your gravitational potential ($m = 70kg$) energy at the top of the CN tower relative to the ground (

Sample problem 2



a book is sitting on a shelf,

what is GPE

a.) relative to the floor

b.) relative to the bookshelf