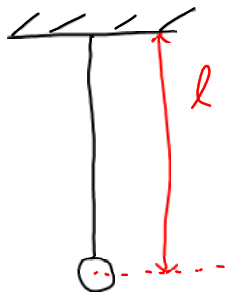
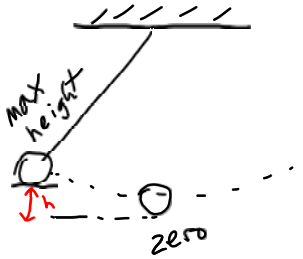
CP - Dec 7 27 years of teaching today

CLT - Describe what affects the period of a pendulum, Compare PE + KE for a Pendulum.



when motionless,
PE = 0
KE = 0



PE = mgh

highest 100cm
lowest 34cm

$12lb\left(\frac{kg}{2.2lb}\right) = 5.45kg$ h = 100 - 34cm = 66cm = .66m

$PE_{Top} = (5.45)(9.8)(.66m)$

$\boxed{35.25\ J}$

$PE_1 + KE_1 = PE_2 + KE_2$
before after

Example

100J + 0 = 0 + 100J

= 20J + 80J
PE KE

what is the velocity of the ball at the lowest point?

$PE_{max} + KE_{zero} = PE_{zero} + KE_{max}$

$mgh = (5)(9.8)(.4m) = 19.6J = KE$

$2(19.6J) = \frac{1}{2}mv^2$

$\frac{39.2J}{m} = \frac{mv^2}{m}$

$\frac{39.2J}{5kg} = v^2$

$7.84\frac{m^2}{s^2} = v^2$

$\boxed{v = 2.8\frac{m}{s}}$

Data from Lab

Mass	length	release angle
ℓ = 25 cm 15°	M = 100 g 15°	M = 100 g ℓ = 25 cm
1 50 g		
2 100 g		
3 200 g		

$\frac{18\,s}{5\ swings} = \frac{3.6\,s}{swing}$ = The Period

Period – time for 1 event
(swing, wave, season, etc)

$$T = 2\pi\sqrt{\frac{\ell}{|g|}}$$ — length; g

guess 4m = length

$$T = 2\pi\sqrt{\frac{4\,m\,s^2}{9.8\,m}}$$

$$= 2\pi\sqrt{\frac{4}{9.8}\,s^2}$$

T = 4.01 s

ℓ = 2.87 m

$$T = 2\pi\sqrt{\frac{2.87}{9.8}}$$

= 3.4 s