Name Teacher Hour

Xtreme Swing

OBJECTIVE: Determine the time of one full swing. Use a stopwatch to measure several cycles and average the readings. Calculate the cycle using the following equation:

$$T = 2\pi\sqrt{\text{(Length of arm/gravity)}}$$

DATA: Length of arm = 30 meters

Time seconds for a complete cycle = _____ sec

Time seconds for a complete cycle = _____ sec

Time seconds for a complete cycle = _____ sec

Measured Average time = (_____ s + _____ s + _____ s)/3 = _____ s

FORMULA USED: $T = 2\pi\sqrt{\text{(Length of arm/gravity)}}$

WORK:

Calculated Answer: _____ **s**

Compare your average time with the calculated time. Are they the same? Why or why not?

OBJECTIVE: Calculate the Gravitational Potential Energy of the people at the top of the ride. The arm is 40 meters high.

DATA: Height = 40 meters Mass of car = 1,000 kilograms

Mass of people = 20 people x 60 kg = 1200 kilograms

FORMULA USED: PE = m x g x h m = Mass in kilograms
h = Height in meters g = Gravity at 9.8 m/s/s

WORK:

Answer: _____ Newton-meters

OBJECTIVE: Using the Law of Conservation of Energy, calculate the expected speed of the boat at the bottom of the hill.

DATA: Gravitational Potential Energy = _____ Newton-meters

FORMULA USED:

PE = KE KE = $\frac{1}{2}$ m x v^2 m = Mass in kilograms, v = speed in m/s
Potential Energy = Kinetic Energy m = √(2KE/m) or V= √(2PE/m)

Work:

Answer: _____ Newton-meters

OBJECTIVE: Concentrate only on how forceful you are "pushed" down in the seat, or "lifted" against the retaining bar while you are the ride. If you can, try this with your eyes closed for the entire ride!

L = LARGE M = MEDIUM S = SMALL N = NEUTRAL

Where you are pushed…	Into the seat			Or	Against the bar		
Half way up	L	M	S	N	S	M	L
At the top	L	M	S	N	S	M	L
At the bottom	L	M	S	N	S	M	L