PhET Pendulum Lab – Pandemic Version

Purpose:

Determine the relationship between Gravitational Energy and Kinetic Energy when using a pendulum.

Instructions:

Simulation: Run http://phet.colorado.edu/en/simulation/pendulum-lab

Choose a fixed mass and length to keep throughout the experiment.

Choose no friction. Choose Earth. The pendulum bob has width .1 meters.

To determine the experimental velocity of the bob, choose 1/16 time and use the stopwatch to measure the time it takes for the diameter of the pendulum bob to pass completely through the lowest point.

Fill in the blanks:

Mass of weight_____ kg

Diameter of mass _____ m

Solve for the velocities at the bottom of the swing for three different initial heights of your choice.

Use conservation of energy principles.

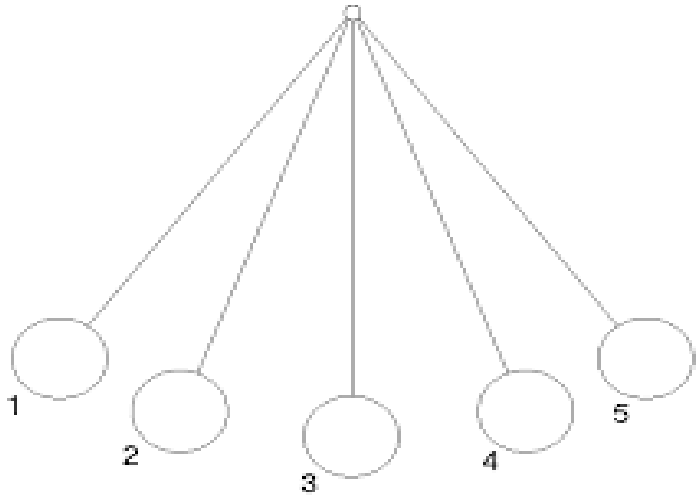
Hint: $E_g=mgh$ $E_k=.5mv^2$

(a) h = ____m (b) h = ___ m (c) h = ___ m

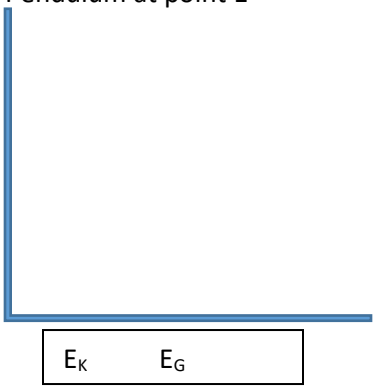
Record your solutions as 'theoretical velocity' in the data table below. The pendulum bob has width .1 meters. To determine the 'experimental velocity' of the bob, choose 1/16 time and use the stopwatch to measure the time it takes for the width of the pendulum bob to pass completely through the lowest point.

Condition	Height (m)	Experimental Velocity (m/s)	Theoretical Velocity (m/s)
1			
2			
3			

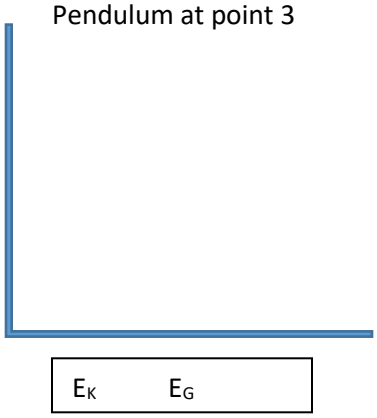
What are some reasons the theoretical and experimental velocities may differ?



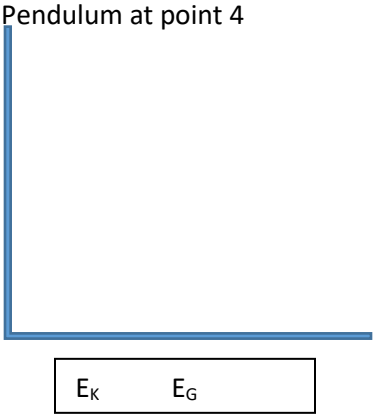
Pendulum at point 1



Pendulum at point 3



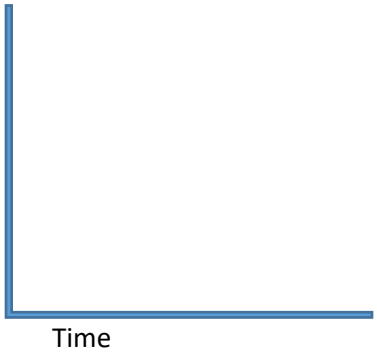
Pendulum at point 4



Sketch the following qualitative graphs when the pendulum begins at the top of its swing:

Mechanical Energy v. Time

Gravitational Energy v. Time



Kinetic Energy v. Time