

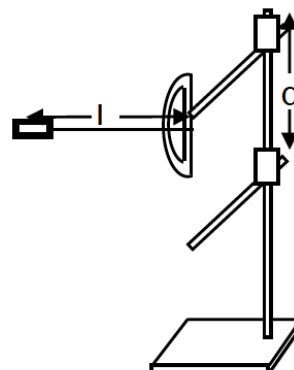
Peg and Pendulum Lab

Procedure

Briefly, but completely, describe the procedure for this lab – and include a labeled sketch.

Data

L	D



Graphs

Using appropriate scales, labels and units, graph D vs. L . This graph should be linear. Draw the best fits line of your graph.

Questions

- 1) Draw a free-body diagram for the mass when it is at the bottom of the little circle (vertically below the peg with the peg as the center). In terms of the variables used, and fundamental quantities, what is the speed for the mass at this position?
- 2) Draw a free-body diagram for the mass when it is at the top of the little circle (vertically above the peg with the peg as the center). In terms of the variables used, and fundamental quantities, what is the minimum speed for the mass at this position?
- 3) Using the Conservation of Energy Law, and the centripetal force equation, algebraically develop the relationship between D and L . What is the ratio of D to L ?
- 4) Use your answers to the first three questions, along with the appropriate radius, to derive expressions for the angular momentum of the mass at the bottom and top of the smaller circle. Use the peg as the center of rotation. Use a ratio to show that only about 45% of the angular momentum remains at the top, compared to the bottom. Why does this system lose angular momentum?
- 5) Find the equation of your best-fits line. Show your work.
- 6) Use your answer to (3) as the accepted value for the slope of the D vs. L graph. Find the percent error between this value and the slope of your best-fits line.

Error Analysis

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.

