Energy – Force Lab

Procedure

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

Data

Cart Mass = _____

Peg Diameter = _____

x	F_{red}	F_{blue}	t

Graphs

Using appropriate scales, labels and units, graph F_{red} vs. x and F_{blue} vs. x. to find the spring constant of each spring. Then graph E_{total} vs. x and F_{total} vs. x. Place one graph immediately above the other, and use the same scale for displacement. These two graphs will likely use all four quadrants, so place your origin in the center of your graph, rather than in the bottom left corner. If one is not linear, figure out how to make another graph linear. Draw a best-fits line for any linear graph.

Questions

1) Use your F_{red} and F_{blue} to complete a column in your data table for F_{total}. Use your peg diameter and time to complete a column for velocity through the equilibrium point. Use the cart mass and velocity to complete a column for E_{total} through the equilibrium point. Show one example of each calculation.

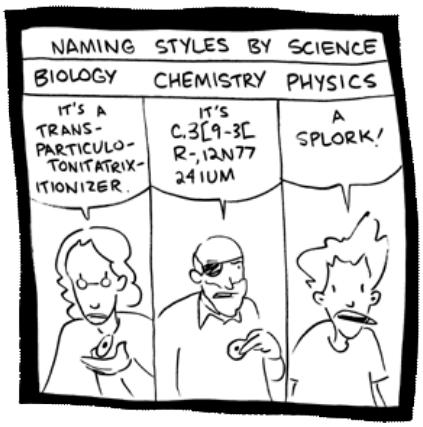
2) Find the spring constants of the "red" and "blue" springs. Show your work.

3) Find the equation for the best fits line of your F_{total} graph. Show your work. Use the slope of your line to find the combined spring constant of the springs.

4) Find the equation for the best fits line of your linear E_{total} graph. Show your work. Use the slope of your line to find the combined spring constant of the springs.

5) Are the springs in series, or parallel? Look up these terms and use your actual graphs and equations to support your answer.

6) Find the percent difference (not the same as percent error) between the combined spring constants.



Error Analysis

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