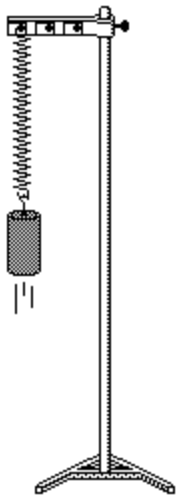
Lab 6-2: The Spring Challenge



In this experiment, each lab group will be given a spring, meter sticks and rulers, and a set of masses. Using only this equipment (and calculators and/or computers), it is your task to determine as precisely as possible:

I. The mass which, when attached to this spring, would give the system a **period of 0.75 seconds**.

II. How far that mass will fall before springing back up again when it is **released from rest with the spring in the unstretched (relaxed) position**.

Points for this assignment will be awarded for accuracy, as well as for the quality of your method and the clarity of your report. Of course, you may ask questions of your instructor along the way (and he/she may or may not answer them...).

When you think you are ready to test your predictions, call your instructor over. Your instructor will measure your period of oscillation with a stopwatch. Then you will set your mass up in the appropriate position so that it should nearly hit the table when you drop it. You should measure how fall the mass actually falls, so that you can compare this to your predicted distance.

This lab is **not** to be carried out in a trial and error manner. You will not have access to a stopwatch, and you may not use a timing device of your own (or someone else's). You also may not test drop the mass to see how far it falls.

The report for this assignment should include the following:

- A method section in which you carefully describe how you determined the mass that would give you a period of 0.75 seconds , and the distance that this mass would fall when released from rest from the unstretched spring.

- A data section listing *all* of the measurements you made, and your predicted and measured results for the period and distance fallen.

- An analysis section containing

  I. A set of calculations and/or graph showing how you obtained your value for the spring constant

  II. A calculation showing how you determined the mass to be attached to your spring to achieve the desired period

  III. A calculation showing how you determined the distance that the mass would fall when released from rest with the spring relaxed

- A conclusion in which you summarize your results and discuss what you see as the main sources of error.

EXTRA CALCULATIONS

These calculations, if done properly and shown neatly, will raise your grade on this lab.

1. Calculate the maximum velocity obtained by your mass during its oscillation and state where this velocity occurs.

2. Calculate the maximum upward acceleration obtained by your mass during its oscillation and state where this acceleration occurs.

3. Calculate the average speed obtained by your mass during its oscillation.