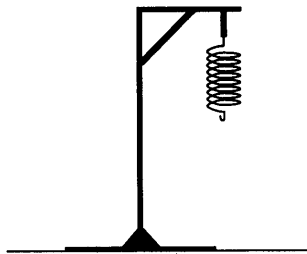


DISCUSSION:

The spring constant, k , of an ideal spring is defined as the force per unit length and differs from one spring to another. It can be measured in both a static (motionless) and dynamic (in motion) systems. Different techniques are used to determine the spring constant in these situations. In static determinations, Newton's 2nd Law can be applied to equilibrium positions and in dynamic systems laws of periodic motion apply.

THE EXPERIMENT:

A spring that can be assumed to be ideal hangs from a stand, as shown above.

1. You wish to determine experimentally the spring constant k of the spring in a static (motionless) situation.
 - a. What additional, commonly available equipment would you need?
 - b. What measurements would you make?
 - c. How would k be determined from these measurements?
2. You wish to determine experimentally the spring constant k of the spring in a dynamic (moving) situation.
 - d. What additional, commonly available equipment would you need?
 - e. What measurements would you make?
 - f. How would k be determined from these measurements?
3. Obtain a spring from the instructor and perform your experiment. Be sure to note which spring you have in your lab notebook.

ANALYSIS:

In addition to any necessary data, measurements and calculations from the experiment itself, include the following in your lab report.

1. Perform your experiments in static and dynamic situations and determine the spring constant in both.
2. Ask your instructor for the spring constant of the spring you received. Determine the experimental error from the standard value of the spring. Which method is more accurate? How could your experiment have been improved?