Demonstration Spring Set

Model No. ME-9866

PASCO®
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Warranty

For a description of the product warranty, see the warranty description in the *PASCO* catalog.

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Equipment List

Included Equipment	Replacement Part Number*
1. Four Demonstration Springs Spring constants: 4N/m to 14 N/m Lengths: 11 cm to 22 cm	

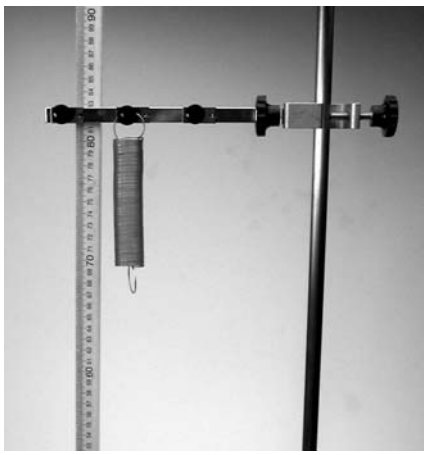
*Use Replacement Model Numbers to expedite replacement orders.

Additional Equipment Recommended	
Hooked Mass Set	SE-8759
Large Rod and Base	ME-9355
Pendulum Clamp	SE-9443
Physics String	SE-8050
Meter Stick	SE-8695

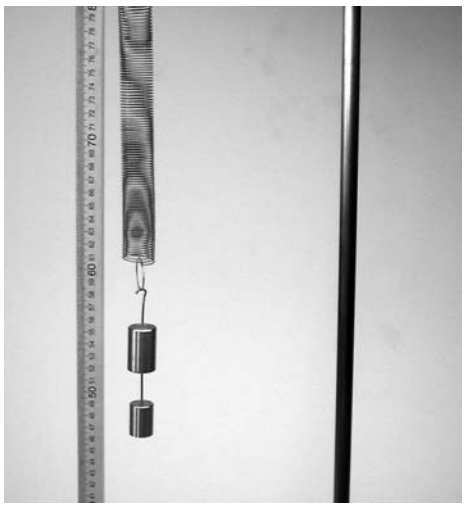
Introduction

PASCO's Demonstration Spring Set includes four large springs for use in demonstrations of Hooke's Law, static equilibrium and conservation of energy. Each spring is constructed of durable spring steel and includes convenient hooks at each end.Independence of X and Y Motion.

Discovering Hooke's Law



1. Hang the desired spring from a horizontal support and measure the distance from the bottom of the spring to the tabletop or floor. Record this distance in a data table.



2. Place a hooked mass or mass hanger on the bottom on the spring.

3. Measure the distance from the bottom of the spring to the tabletop or floor.

4. Subtract the "initial distance" from the new distance to calculate the stretch of the spring. Record this value in a data table.

5. Place more mass on the spring and repeat measurements/ calculations.

6. Collect at least six pairs of hanging mass and stretch data.

7. Convert the hanging masses to force using the acceleration due to gravity:

$$9.81\ \frac{m}{s^2}$$

8. Create a graph with force on the vertical axis and stretch on the horizontal axis.

9. Using y = mx + b, write an equation for each of the lines. Make sure to include appropriate variables, numbers, and units in the equation.

10. The slope of the Force vs. Stretch graph in known as the spring constant or rate. The vertical intercept represents the amount of force needed to begin stretching the spring and is also known as the initial tension.

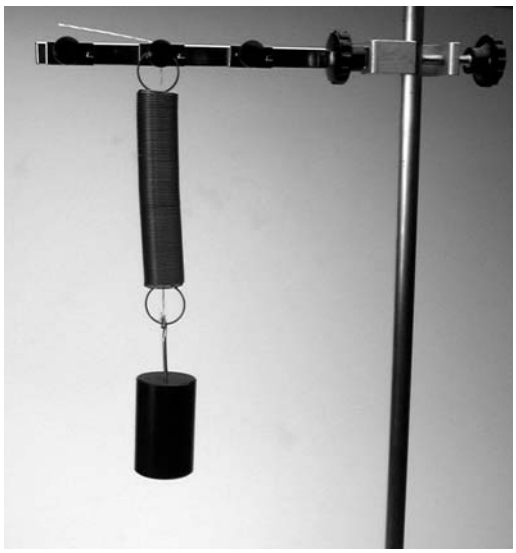
Conservation of Energy

1. Determine the spring constant of the strongest spring.

2. Hang the spring from horizontal support above a tabletop.

3. Tie a 30 cm piece of string to a 200 g mass.

4. Feed the string through the center of the spring and tie to the horizontal support such that the hook of the mass is around the bottom loop of the spring, but not stretching it.



5. Ask students to use conservation of energy to calculate how far the mass will fall when the string is cut.

6. The horizontal support should then be adjusted so the mass will just miss the tabletop when the string is cut.

7. Cut the string to test the students' hypothesis.