

Name: _____ Period: _____

PHYSICS: HOOKE'S LAW LAB

The purpose of this lab is to graphically and mathematically determine the relationship between the force and the amount of stretch of a spring.

Caution against over-stretching the springs.

Materials

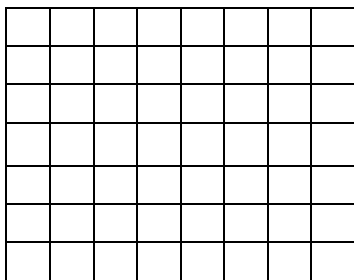
- Spring
- Meter stick
- Masses

Data

Mass (g)	Force (N)	Spring Stretch – Displacement (cm)	Spring Stretch – Displacement (m)

Hooke's Law Practicum

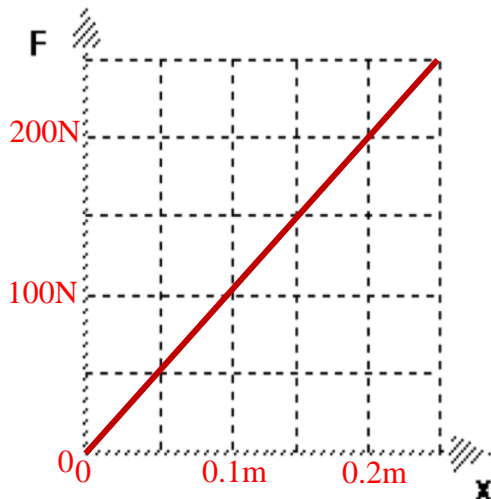
1. Graph F (N) vs. X (stretch in meters), despite the fact that force was the independent variable.
2. Label X & Y axis of graph and sketch a line. Fill-in data table and with correct units.



Your Slope with units	
Given Mass	
Equation for your line	
Equation with variables used	
Prediction of Spring Stretch	
Actual Spring Stretch	
% Error	

Hooke's Law and Elastic Energy

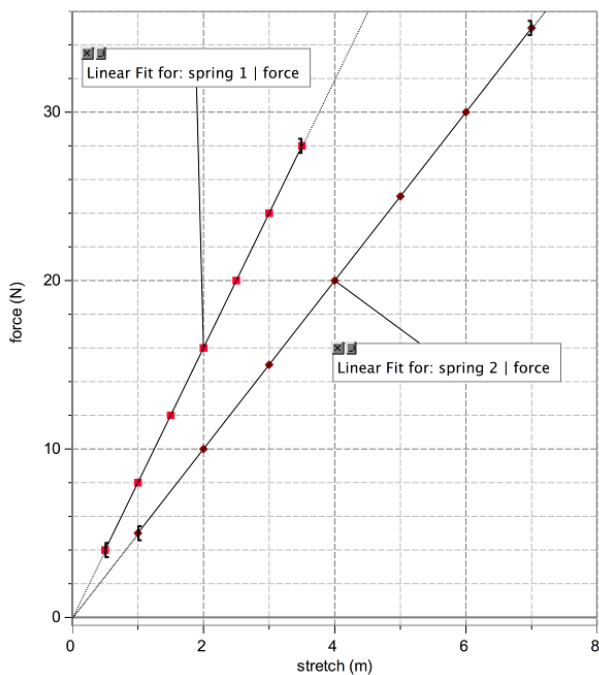
Suppose one lab group found that $F = 1000 \text{ N/m} (\Delta x)$. A graph has been made with their data.



1. Graphically determine the amount of energy stored while stretching the spring described above from $x = 0$ to $x = .1\text{m}$

2. Graphically determine the amount of energy stored while stretching the spring described above from $x = 15$ to $x = 25$

The graph below was made from data collected during an investigation of the relationship between the amounts two different springs stretched when different forces were applied.



3. Determine the spring constant for each spring. (Hint: slope of the line)

Spring 1 = _____

Spring 2 = _____

4. For each spring, compare:

a. the amount of force required to stretch the spring 3.0 m.

Spring 1 = _____

Spring 2 = _____

b. the E_{el} stored in each spring when stretched 3.0m.

Spring 1 = _____

Spring 2 = _____

5. The spring below has a spring constant of $10. \text{ N/m}$. If the block is pulled 0.30 m horizontally to the right, and held motionless, what force does the spring exert on the block? Sketch and label a force diagram with correct vector lengths for the mass as you hold it still. (Assume a frictionless surface.)

