

**GNSC 1110L LAB PRE-TEST
THE SPRING CONSTANT**

1. State the objective of this experiment.
2. What is spring constant?
3. What law will be used to describe the relationship between the force and the elongation?
4. What is Hooke's law? Explain in words. Also write down the formula.
5. What is elastic limit?
6. What does each symbol in the formula represent? $F = k d$

Write down the SI units for each.

7. A graph of applied force vs. elongation will be plotted. What does the slope represent?
8. Find the slope of this graph. What does the slope represent?
9. What is the difference between two springs made of the same material, one that has a k value of 100 N/m and one that has a k value of 1000 N/m

Ans.

6. F - force exerted on spring; Newtons

k - Spring constant; N/m

d - Elongation; m

7. Spring Constant

8. Take two points that are on the line for the slope calculation (mark with 2 dashed lines). Remember do not use original data points.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4.40 \text{ N} - 1.90 \text{ N}}{0.430 \text{ m} - 0.182 \text{ m}} = 10.1 \text{ N/m}$$

Spring Constant, $k = \text{slope} = 10.1 \text{ N/m}$

9. It takes 10 times as much force to stretch or compress the second spring the same distance as the first spring.