Hook's law

Objective:-

To calculate the spring constant **k** .

Theory:-

Hooke's Law is a scientific law which concerns itself with the elasticity of materials. It states that when a force is applied to a spring, the displacement of that spring will be directly proportional to the amount of force applied

As an equation, it can be written as:

$$F = - k\Delta x$$

$$-Mg = - k\Delta x$$

Where

F is the force applied to the spring (**N**), and **F = Mg**
M is the mass of body (**kg**), **g** is the acceleration due to gravity ($\mathbf{m/s^2}$)
Δ *x* is the elongation of the spring (**m**).
k is the spring constant (**N/m**).

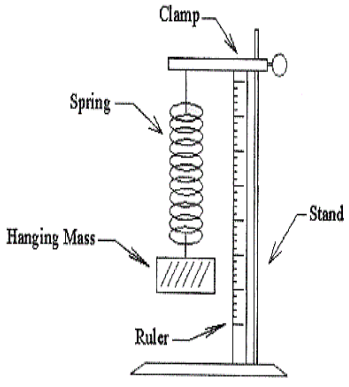
The force is in opposite direction of the elongation.

$$\Delta x = \frac{g}{k} M$$

$$k = \frac{g}{slope}$$

Apparatus:-

Clamp	Mass	Ruler
Spring	Stand	



Procedures :

1. Measure the initial length of spring x_0 without hang any mass.
2. Hang a **M_1** on spring and record the displacement.
3. Record the displacement for different values of mass **M** and tabulate the results.
4. Graph the relation between the mass **m** on the **x-axis** and the elongation **Δx** on the **y-axis** and **calculate the slope.**
5. Use the graph to calculate the **spring constant k.**