

# Graph Skills 1 : Hooke's Law

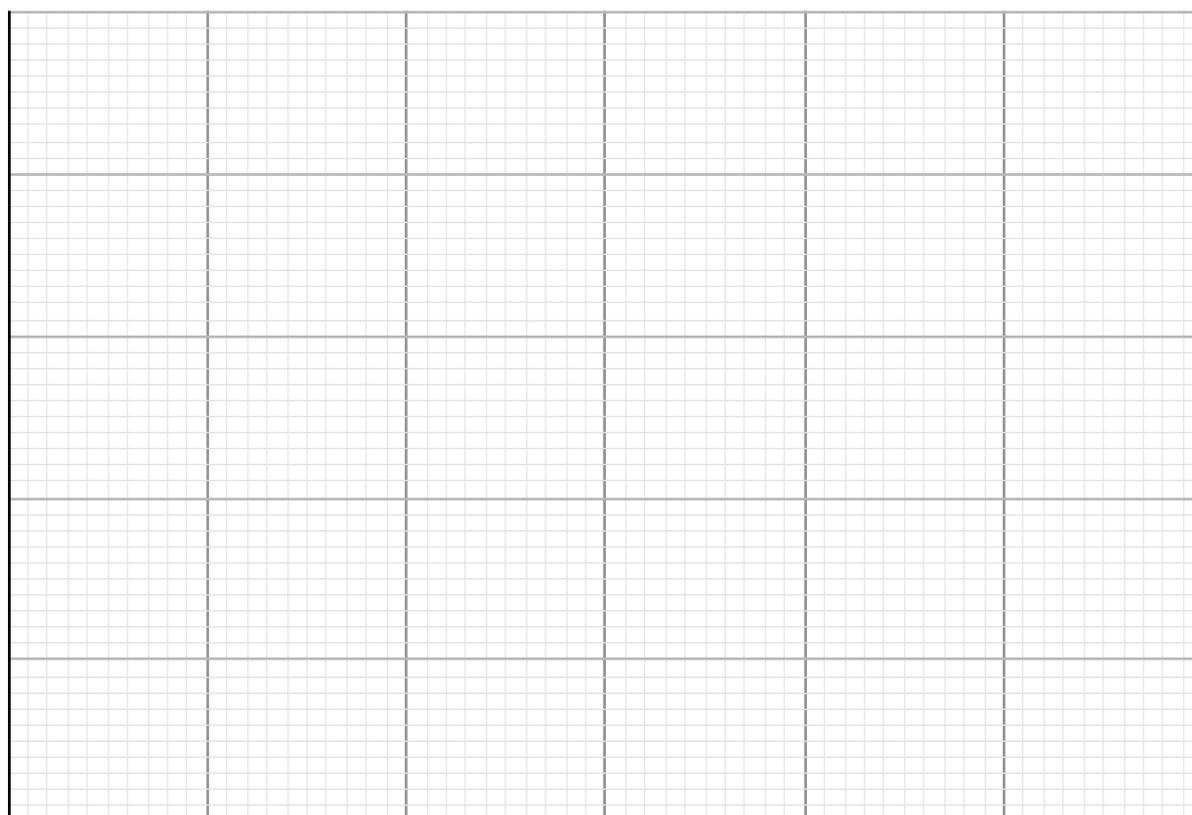
1. Complete this table of data and then plot the results onto the graph grid below by using an appropriate set of scales on the axes.

Mass (g)	Load (N)	Length (cm)	Extension (cm)
0		2.2	
100		5.6	
200		9.1	
300		12.7	
400		15.5	
500		19.1	
600		23.0	

Load (y-axis) against Extension (x-axis)

Load = mass in kg  $\times$  9.81

Extension = length - original length (original length is length for load = 0 N)



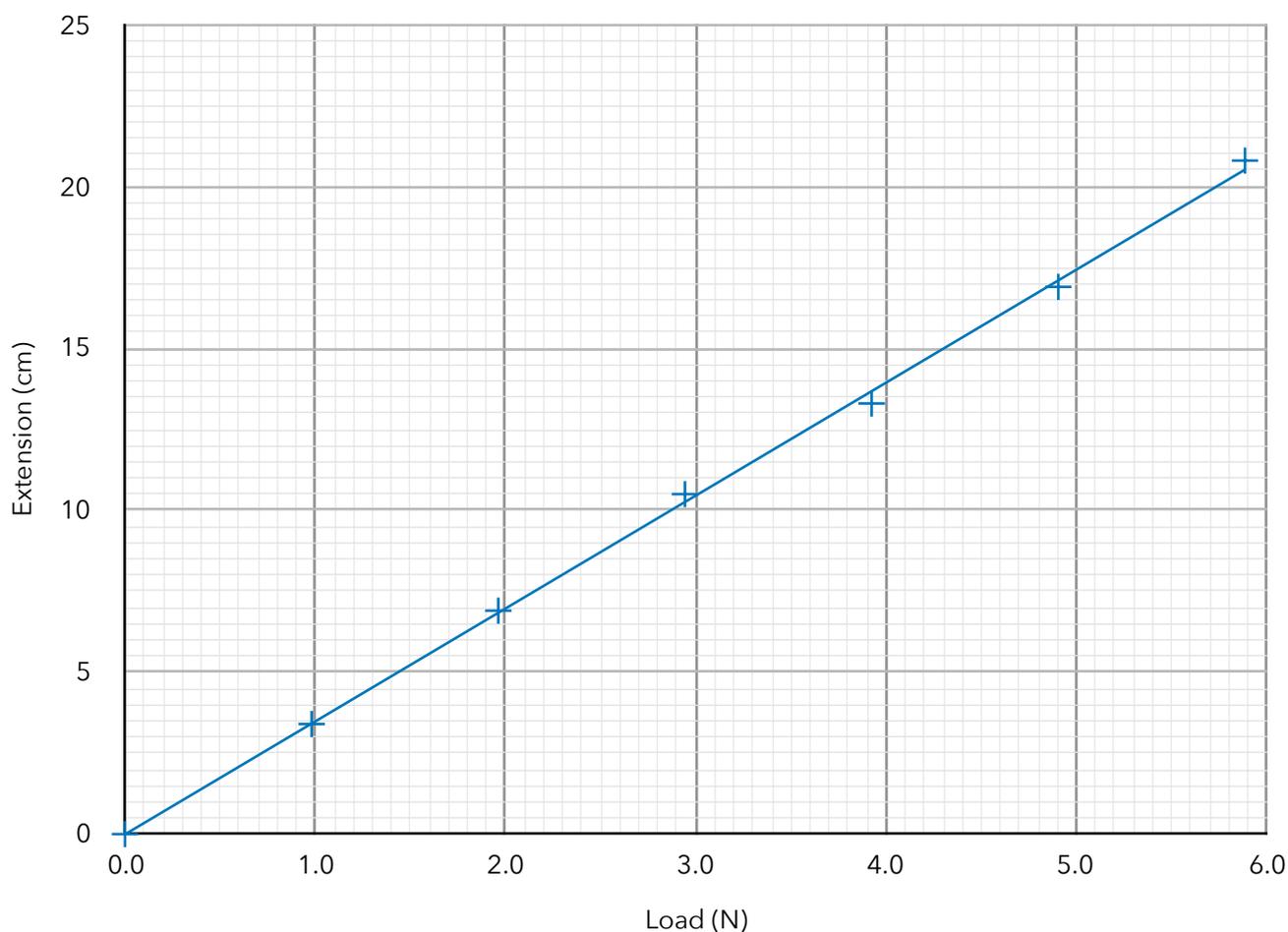
2. Draw a straight line of best fit.
3. Calculate the force constant of the spring (equal to the reciprocal of the gradient of the line).

# Graph Skills 1 Solutions

1. Table of data.

Mass (g)	Load (N)	Length (cm)	Extension (cm)
0	0.0	2.2	0.0
100	1.0	5.6	3.4
200	2.0	9.1	6.9
300	2.9	12.7	10.5
400	3.9	15.5	13.3
500	4.9	19.1	16.9
600	5.9	23.0	20.8

2. Graph with line of best fit.



3. **Calculate gradient:**  $\text{gradient} = (y_2 - y_1) \div (x_2 - x_1) = (20.5 - 0) \div (5.9 - 0) = \underline{\underline{3.47}}$   
**Force constant:**  $k = 1 \div \text{gradient} = \underline{\underline{0.29 \text{ N cm}^{-1}}}$