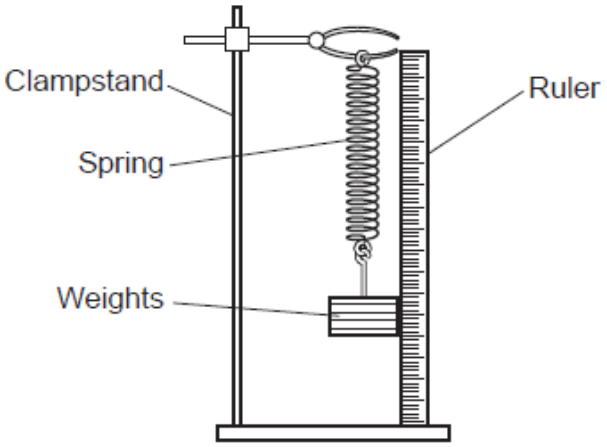
Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)

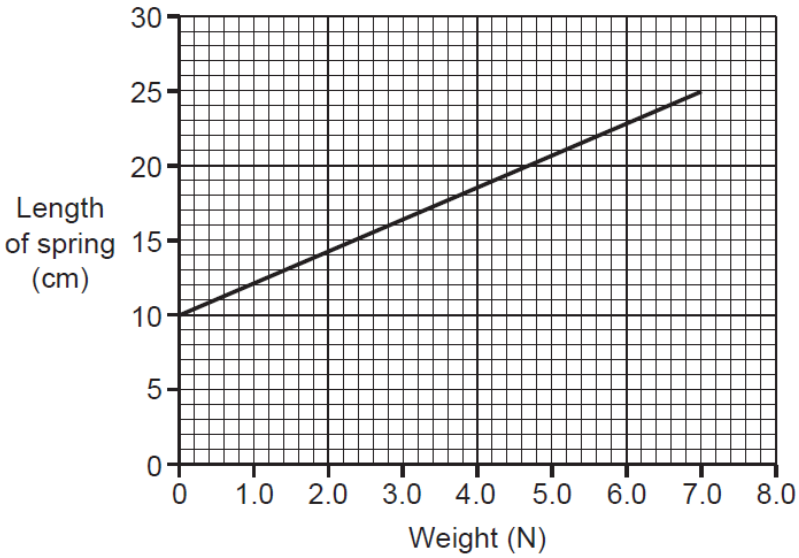
J259/04 Depth in physics (Higher Tier)

Question Set 24

1 Li does an experiment to investigate the stretching of a spring.



Li records the length of the spring for different weights on the spring, and plots the graph, as shown.



(a) **(i)** The relationship for the spring can be expressed in the form L **= m**W + **c**, where L is the length and W is the weight.

Find out the gradient, **m**, and the y-intercept, **c**, to complete the relationship for this spring.

Relationship for the spring = ... **[3]**

(ii) The length of the spring is proportional to the weight on the spring.

What physical quantities are represented by the y-intercept, **c** and the gradient, **m**?

[2]

(b) Li tests another spring which has a spring constant of 60 N / m.

The spring has an original length of 6 cm, and stretches to a length of 18 cm when some weights are added.

Calculate the energy stored in this spring when these weights are added.

Use the equation:
energy stored in a stretched spring = ½ × spring constant × (extension)^2

Energy stored = ... J **[4]**

Total Marks for Question Set 24: 9