

GCSE Physics A (Gateway)

J249/01 Physics A P1-P4 and P9 (Foundation Tier)

Question Set 11

1 A student has a spring, a ruler and a 2.0 N weight.

- (a) Describe how the student can use this equipment to determine the **spring constant** of the spring.

[3]

the student can use hooke's law
 $F = kx$. F would be the 2 N weight
and the student could then measure
the extensions of the spring and rearrange
the formula for k which will be the spring
constant ($\frac{F}{x} = k$). Calculate the average
of k .

- (b) The 2.0 N weight has a surface area of 0.005 m².

Calculate the **pressure** when it is placed on a surface.

Use the equation: pressure = force normal to a surface ÷ area of that surface

$$2 \times 0.005 = 0.01$$

$$\text{Pressure} = \dots\dots\dots 0.01 \dots\dots\dots \text{Pa}$$

[2]

- (c) Describe how to change the shape of an object.

Use the idea of forces in your answer.

[2]

you can apply a force to an object that can stretch or compress
it, therefore changing its shape

- (d) Describe the differences between elastic and plastic deformation.

[2]

Elastic deformation: the object will return to its original
shape when the force is removed
Plastic deformation: the object will not return to
its original shape and will be permanently deformed.

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