Oxford Cambridge and RSA

# 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 2N weight and the student could then measure the extension 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 $m^2$.

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

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

$2 \times 0.005 = 0.01$

Pressure = 0.01 Pa **[2]**

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

Use the idea of forces in your answer. **[2]**

you can an 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.