

# OCR (B) Physics GCSE

Topic 6.3 - How does the particle model  
relate to materials under stress?

Flashcards

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When **more than one force** is applied to a solid object it can be...



When **more than one force** is applied to a solid object, it can become...

Compressed, stretched or twisted.



# What is elastic deformation?



# What is elastic deformation?

The object returns back to its original shape when stresses are removed.



# What is plastic deformation?



# What is plastic deformation?

When the object is permanently deformed; it no longer returns to its original form.



How does compression/stretching affect particle arrangement?





How does compression/stretching affect particle arrangement?

It changes the spacing and forces between particles.



# What is Hooke's law?



## What is Hooke's law?

The extension of an elastic object is directly proportional to the force applied to it.

(note: only within the limit of proportionality).



Describe a force/extension graph for an elastic material



Describe a force extension graph for an elastic material

It will form a straight line through the origin.

Gradient =  $k$  (spring constant)



What does the curved section of a force/extension graph represent?



What does the curved section of a force/extension graph represent?

Plastic deformation.



When work is done on a spring, what kind of energy is converted?





When work is done on a spring, what kind of energy is converted?

Elastic potential energy.



Give the equation for work done on a  
spring



Give the equation for work done on a spring

Where...

$$W = \frac{1}{2}kx^2$$

$W$  = work done (J)

$K$  = spring constant (Nm)

$X$  = extension (m)

