CP12-13 Revision Mat

Energy and Changes of State

Describe what happens to particles in a solid when they gain thermal energy

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State 3 factors which affect the amount of thermal energy stored in an object

1. ……………………………………………………………………………
2. …………………………………………………………………………….
3. …………………………………………………………………………….

State what is meant by specific heat capacity

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State what is meant by specific latent heat

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Sketch a heating curve to show the state changes of a pure substance

*Identify the three states of matter*

*Identify the melting and boiling point*

*Practical Skills:*

List the equipment needed to investigate densities of objects

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Describe one way of increasing the accuracy of measuring the density

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Describe the difference between chemical and physical changes

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State the equation that links mass, density and volume

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A 400kg block of steel has a volume of 10m3. Calculate the density

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If the density of an object is 3500kg/m3. Calculate the volume if the object has a mass of 400kg.

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Particles and density

What does the kinetic theory state?

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Draw particle diagrams for solid, liquid and gases

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|  |  |  |
| Solid | Liquid | Gas |

Describe how particles are arranged in solids

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Describe how particles are arranged in liquids

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Describe how particles are arranged in gases

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Explain why gases are compressible

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Gas Temperature and Pressure

Describe the effect of temperature of the average kinetic energy

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Describe what causes pressure

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State the units of pressure

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Explain what happens to the pressure when a gas in a sealed container is heated

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**Convert the following:**

0K into oC …………………………………….

10K into oC …………………………………..

500K into oC ………………………………..

0oC into K …………………………………..

30oC into K ………………………………..

100oC into K ………………………………..

Describe the relationship between average kinetic energy and kelvin temperature of a gas

………………………………………………………………………………………….

Energy Calculations

**Equation given in exam:**

**Q = m x L**

*Q = Thermal energy (J)*

*m= mass (kg)*

*L = specific latent heat J/kg)*

When a kettle boils, 180g of water changes to steam. Calculate the amount of energy required for this change.

Specific latent heat of vapourisation = 2.3 x 106 J/kg

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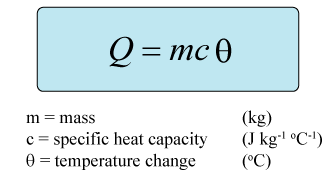
Calculate the energy released when 0.025kg of condensation form.

The specific latent heat of vapourisation of water = 2.3 x 106 J/kg

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Energy Calculations

**Equation given in exam:**

[](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjvv-qgo5TYAhVQKFAKHZcKBsMQjRwIBw&url=https%3A%2F%2Fwww.pinterest.com%2Fpin%2F207236020326354168%2F&psig=AOvVaw1dVArJEyYUFS1jVyfvIIW8&ust=1513711050382718)

The specific heat capacity of water is 4182 J/kgoC. Calculate the energy needed to heat 4kg of water from 20 to 80oC

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Calculate the temperature change when 30000J of energy is transferred to a 3kg brick if the specific heat capacity is 840 J/kgoC.

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Calculate the mass of bricks if 50000J of energy is transferred raising the temperature from 20 to 40oC.

Specific heat capacity is 840 J/kgoC.

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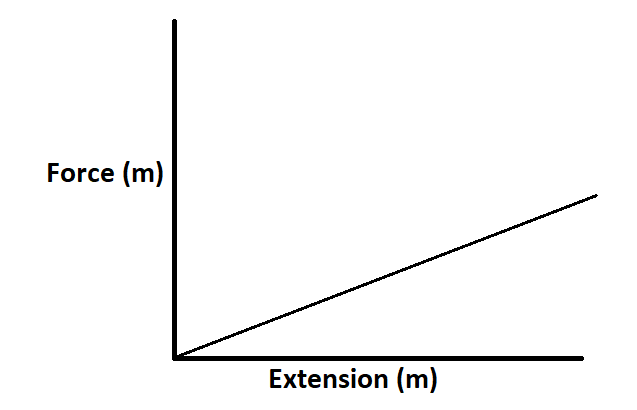
Describe what the spring constant is of a spring

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Sketch a graph to show a spring which has a higher spring constant

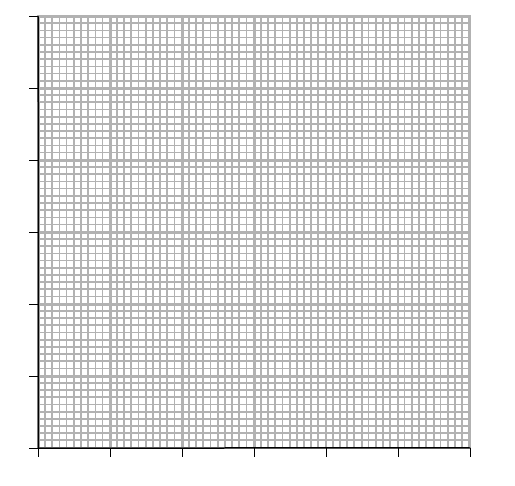


**Equation given in exam**

**E = ½ x k x X2**

Calculate the energy transferred when a spring with a spring constant of 200N/m is stretched by 30cm

Bending and Stretching



Describe the conclusions that can be made from the graph

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State the equation that links spring constant, extension and force

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Calculate the force needed to make a spring extend by 10cm if the spring constant is 200N/m

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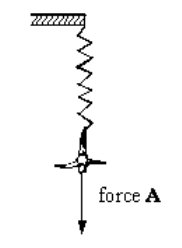
Bending and Stretching

Describe the difference between elastic and inelastic objects

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Identify force A which is acting on the bungee jumper …………………………………………………………………………….



Plot the following data on the graph paper provided

