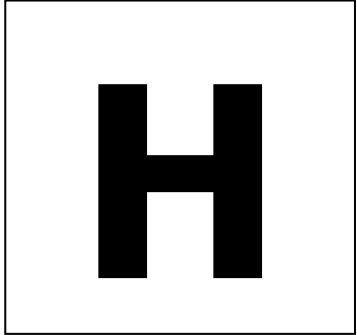




**ST MARY'S SCIENCE
DEPARTMENT:
PHYSICS**



**GCSE PHYSICS HOMEWORK BOOK
TOPIC 4: PARTICLE MODEL OF MATTER
STUDENT BOOK**

YOU MUST ANSWER ALL THREE SECTIONS IN EACH PART OF THE HOMEWORK TASKS

NAME	
CLASS	
TEACHER	
FORM	

TASK	MARK	GRADE
1		
2		
3		
4		
OVERALL		

**GCSE
PHYSICS
YEAR 10
TOPIC 1**



HOMEWORK SCHEDULE

Please use the following table to ensure each homework task is completed and submitted on time.

Carrying out these homework tasks can only increase your ability to gain a high grade in the GCSE examinations.

Failure to hand in work on time will lead to sanctions to complete this work.

Task	Submission Date	Completed?	On Time?
Task 1 Density			
Task 2 Internal Energy			
Task 3 Latent Heat			
Task 4 Gases			



SCIENCE DEPARTMENT MARKING CODE

ID = Insufficient detail in answer

W = Wrong understanding of science.

IR = Irrelevant information given.

V = This is too vague to get a mark.

AQ = Answer the question asked

R = Read the question/information

M = Maths mistake

BOD = Benefit of the doubt given.

E = Explain the answer further please.

U = Wrong units used.

SF = Wrong significant figures used.

SP = Wrong spelling of a technical term

SR = Same reason given twice.

A circle means this lost you marks

An underline means this gained you marks

IMPORTANT NOTE

All sections in each task must be **FULLY ATTEMPTED**.

If students fail to achieve an acceptable mark on each task, they will be made to carry out supervised intervention the following week.

Each week, intervention sessions will be provided to help assist with answering the questions in the homework booklet if students are struggling with the difficulty of the problems.



PLEASE READ

This homework booklet has made with custom selected examination questions and activities to assess your understanding in the concepts covered in class. This will increase your familiarity with the style of examination questions.

Carrying out these questions can only increase your ability to gain a high grade in the GCSE examination.

Thank you for your hard work in completing this book, and good luck.

Mr. Turnbull



TASK 1: DENSITY

SPEC CHECK

Content	Achieved?
The density of a material is defined by the equation: density = mass / volume $\rho = m / V$ density, ρ , in kilograms per metre cubed, kg/m^3 mass, m , in kilograms, kg volume, V , in metres cubed, m^3	
The particle model can be used to explain <ul style="list-style-type: none"> • The different states of matter. • Differences in density. 	
You should be able to recall and apply this equation to changes where mass is conserved.	
You should be able to recognise/draw simple diagrams to model the difference between solids, liquids and gases.	
You should be able to explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules.	

Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
 Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?



SECTION A

This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. Figure 3 shows a battery operated remote control car.

Figure 3



1.1 The car's battery contains a store of energy.

As the car moves, energy from one store is transferred to another store.

Describe how different stores of energy change as the car moves.

[2 marks]

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The car has a top speed of 12 m/s and a mass of 800 g.

1.2 Write down the equation that links kinetic energy, mass and speed.

[1 mark]

Equation

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1.3 Calculate the maximum kinetic energy of the car.

[2 marks]

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Maximum Kinetic Energy = J

1.4 Explain why having a more efficient motor increases the top speed of the car.

[2 marks]

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Figure 4 shows an electric car being charged.

Figure 4



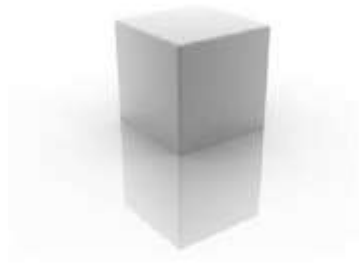


SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1.1 A student wants to calculate the density of the two objects shown in the figure below.



Metal cube



Small statue

© Whitehouse/iStock/Thinkstock,

© Marc Dietrich/Hemera/Thinkstock

Describe the methods that the student should use to calculate the densities of the two objects.

[6 marks]

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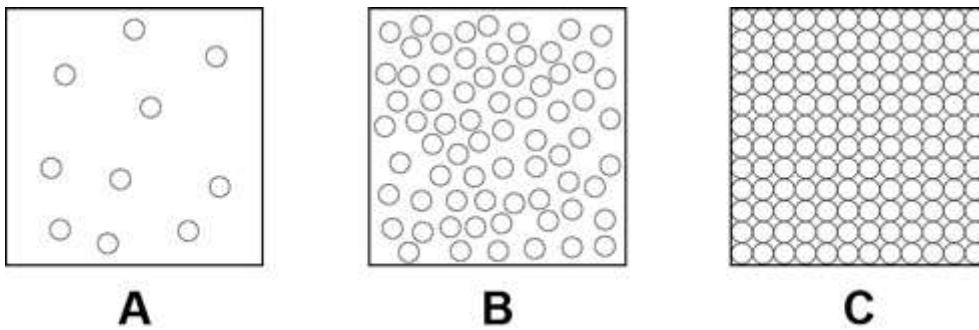
SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. Figure 6 shows a simple model of the three states of matter.

Figure 6



1.1 What is the correct equation to work out the density of a material?

[1 mark]

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1.2 A student explains density to his teacher using the particle model in **Figure 6**.

His teacher says there are limitations to the model.

Give two limitations of the particle model in **Figure 6**.

[2 marks]

Limitation **1**

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Limitation **2**

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1.3 When the gas in a container with a fixed volume is heated, the pressure increases as the temperature increases.

Explain why the pressure increases.

Use the model in **Figure 6** to help you.

[4 marks]

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FEEDBACK SHEET

Overall Mark:	/24	GRADE ACHIEVED:	
Section A :	/11	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B :	/6	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C :	/7	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Previous Topics <input type="checkbox"/> Analytical Skills <input type="checkbox"/> Problem Solving Others (Topic Specific)			
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Previous Topics <input type="checkbox"/> Analytical Skills <input type="checkbox"/> Problem Solving Others (Topic Specific)			
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning. | <ul style="list-style-type: none"> <input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. <p>Other:</p> |
|--|--|

Student response



SECTION A

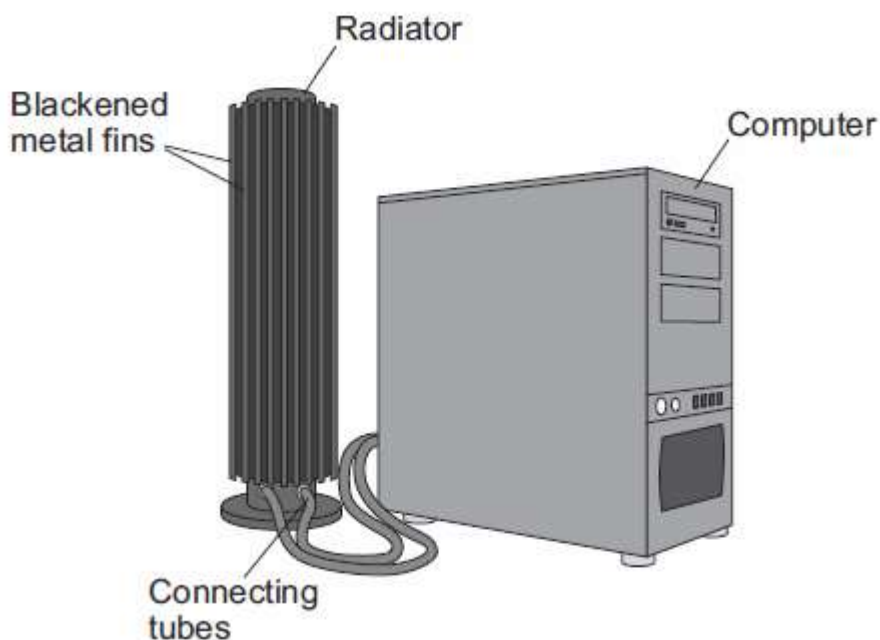
This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. A radiator can be used to help cool the components inside a computer, and prevent the computer overheating.

Figure 12 shows a computer and the radiator that helps to cool it.

Figure 12



The radiator and connecting tubes contain a liquid with a high specific heat capacity. The liquid is heated by the hot components in the computer. The liquid then passes through the connecting tubes to the radiator, where some of its energy is transferred to the surrounding air.

1.1 Explain how each of the design features of the radiator enables it to transfer energy quickly to the surrounding air.

[6 marks]

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1.2 To decrease the temperature of the liquid from 120 °C to 80 °C the radiator transfers 14 000 J of energy.
Mass of liquid in radiator = 0.100 kg
Calculate the specific heat capacity of the liquid.
Use the correct equation from the Physics Equations Sheet.

[4 marks]

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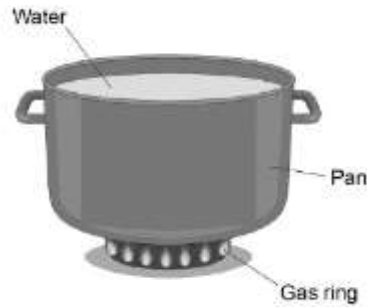
SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. Figure 5 shows a pan of water on a gas ring.

Figure 5



1.1 What is meant by the internal energy of the water?

[1 mark]

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1.2 The water is heated until it boils.

The temperature remains constant at boiling point.

Explain the effect on:

The internal energy of the water

The movement of water molecules.

[3 marks]

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1.3 The energy transferred to the water is 302.4 kJ.

The temperature of the water increased from 20 °C to 100 °C.

Specific heat capacity of water = 4 200 J/kg °C.

Calculate the mass of the water in the pan.

Use the correct equation from the Physics Equation sheet.

[3 marks]

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Mass = kg



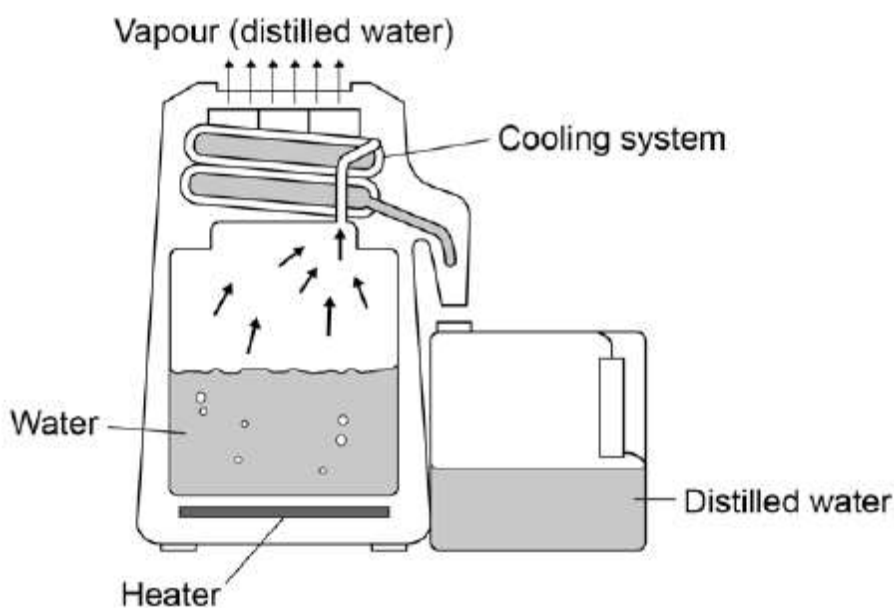
SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. Figure 6 shows a water distiller which is used to purify water.

Figure 6



The distiller boils water and then condenses most of the water vapour back to water.

1.1 The water distiller is filled with 5.0 kg of water at 20 °C

The specific heat capacity of water = 4 200 J/Kg °C

Calculate the energy needed to raise the temperature of the water to 100 °C

Write any equation that you use.

[3 marks]

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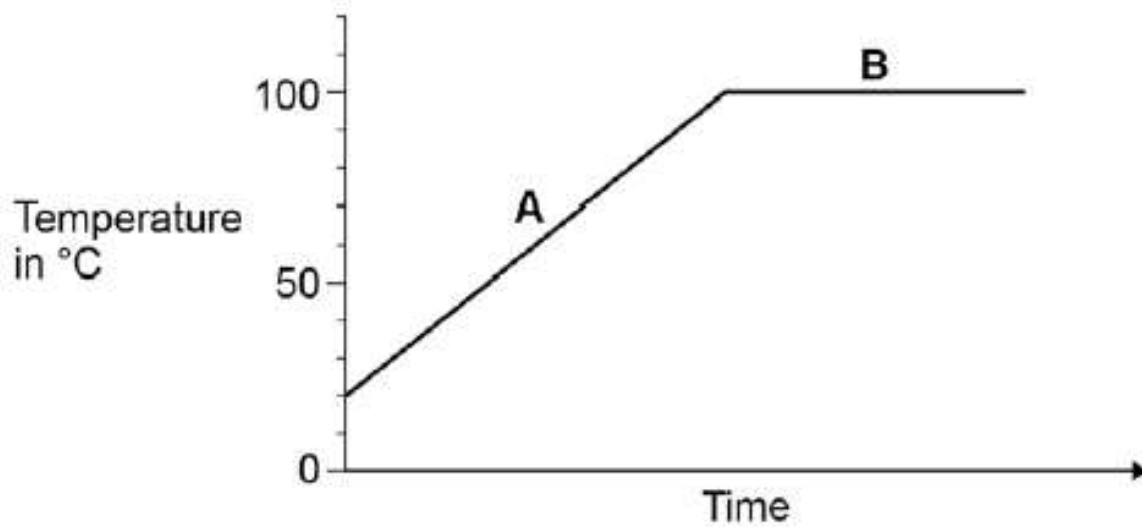
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Energy = J



Figure 7 shows how the temperature of the water in the distiller changes with time.

Figure 7



1.2 Energy is transferred to the water at a constant rate.

Explain why the graph is a different shape in parts **A** and **B**.

[3 marks]

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1.3 When the water drops to a low level, the heater automatically switches off.

Explain what problem would be caused if the heater did not automatically switch off.

[3 marks]

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1.4 The distiller is connected to the mains by a three-core cable.

The wires are covered by different coloured insulation.

What colour is the insulation covering each of the wires?

[2 marks]

Live wire

Neutral wire

Earth wire

1.5 Which statement gives the purpose of the earth wire?

[1 mark]

Tick **one** box.

It carries an alternating potential difference.

It melts if the current in the circuit is too high.

It provides a connection to complete the circuit.

It stops the casing of the appliance becoming live.



1.6 The heating element has a power of 2.5 kW

The resistance of the heating element is 17Ω

Calculate the current in the heating element.

Give your answer to 2 significant figures.

Write any equations that you use.

[5 marks]

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Current = A



FEEDBACK SHEET

Overall Mark:	/34	GRADE ACHIEVED:	
Section A :	/10	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B :	/7	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C :	/17	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

- | | |
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|--|--|

Student response



TASK 3: LATENT HEAT

SPEC CHECK

Content	Achieved?
The specific latent heat of a substance is the amount of energy required to change the state of one kilogram of the substance with no change in temperature.	
energy for a change of state = mass \times specific latent heat $E = m L$ energy, E , in joules, J mass, m , in kilograms, kg specific latent heat, L , in joules per kilogram, J/kg	
Specific latent heat of fusion – change of state from solid to liquid Specific latent heat of vaporisation – change of state from liquid to vapour	
Students should be able to perform an experiment to measure the latent heat of fusion of water.	
Students should be able to interpret heating and cooling graphs that include changes of state.	
Students should be able to distinguish between specific heat capacity and specific latent heat.	

Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
 Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?



SECTION A

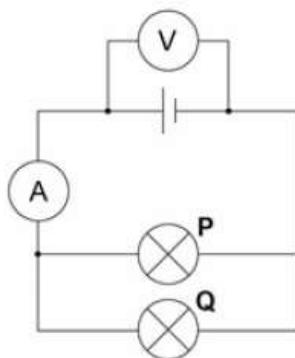
This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. Figure 1 shows a circuit diagram containing two identical lamps arranged in parallel.

The reading on the ammeter is 186 mA.

Figure 1



1.1 Which statement about the current through the lamps is true?

[1 mark]

Tick **one** box.

The current through both lamp **P** and lamp **Q** is **0.093 A**

The current through both lamp **P** and lamp **Q** is **0.186 A**

The current through both lamp **P** and lamp **Q** is **0.93 A**

The current through both lamp **P** and lamp **Q** is **1.86 A**

1.2 One of the lamps breaks and is not replaced.

Which statement about the current in the other lamp is true?

Tick **one** box.

[1 mark]

The current through the lamp is **0.093 A**

The current through the lamp is **0.186 A**

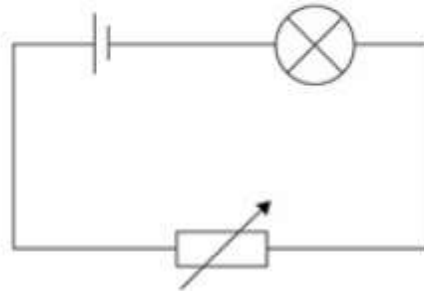
The current through the lamp is **0.93 A**

The current through the lamp is **1.86 A**



Figure 2 shows a circuit that can be used to alter the brightness of a lamp.

Figure 2



1.3 The resistance of the variable resistor is increased.

What effect will this have on the brightness of the lamp?

Explain your answer.

[2 marks]

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When the potential difference across the lamp is 3.3 V, the current is 0.15 A.

1.4 Write down the equation that links current, potential difference and resistance.

[1 mark]

Equation

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1.5 Calculate the resistance of the lamp.

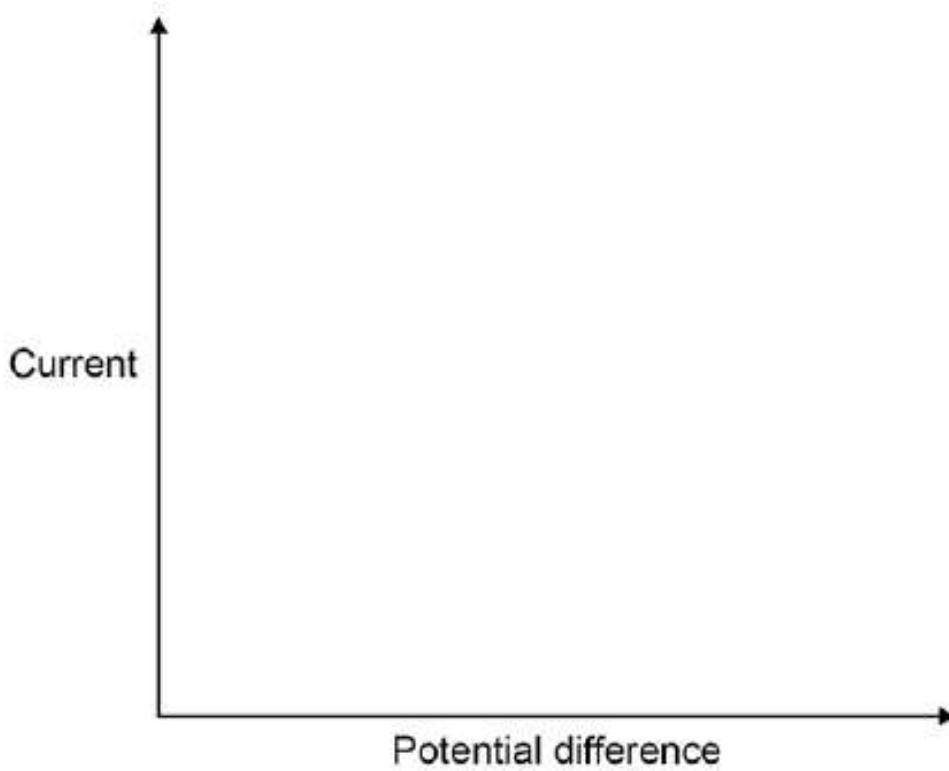
[3 marks]

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Resistance = Ω

1.6 Sketch a current–potential difference graph for a filament lamp.

[1 mark]





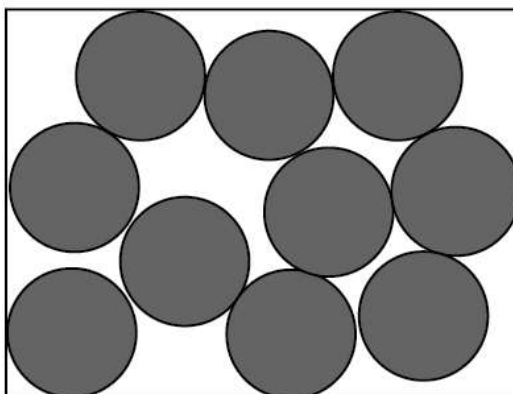
SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. Figure 3 shows a model of the particles in a liquid.

Figure 3



1.1 Give **one** similarity and **one** difference you would see in **Figure 3** if it showed the same substance as a gas.

[2 marks]

Similarity

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Difference

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1.2 Describe **two** limitations of the model shown in **Figure 3**.

[2 marks]

Limitation 1

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Limitation 2

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1.3 Explain why substances have different melting points.

[2 marks]

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1.4 Some fire extinguishers contain liquid carbon dioxide.

Suggest how carbon dioxide gas can be changed to liquid carbon dioxide without reducing its temperature.

[1 mark]

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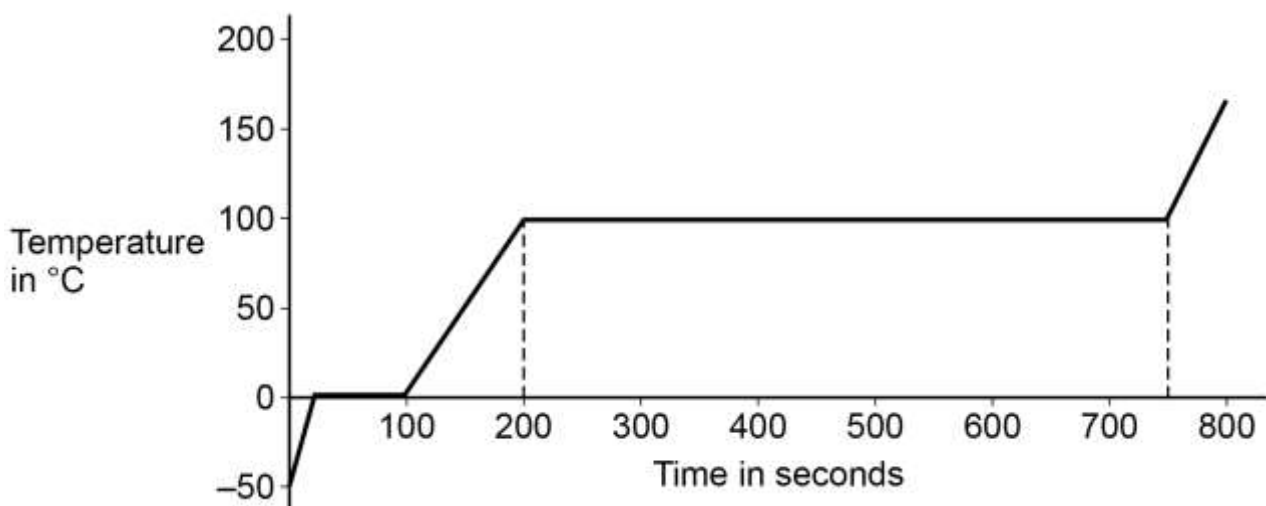
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Ice was heated at a constant rate.

Eventually all the ice changed to a gas.

Figure 4 shows how the temperature changed over 800 seconds.

Figure 4



1.5 What change of state occurs between 200 seconds and 750 seconds?

[1 mark]

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1.6 Explain how **Figure 4** shows that the specific latent heat of vaporisation is greater than the specific latent heat of fusion.

Use data from **Figure 4**.

[2 marks]

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1.7 1695 kJ of energy is transferred to water at 100 °C

The specific latent heat of vaporisation of water is 2.260×10^6 J / kg

Calculate the mass of water changed into a gas at 100 °C

Use the Physics Equations Sheet.

[3 marks]

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Mass of Water = kg



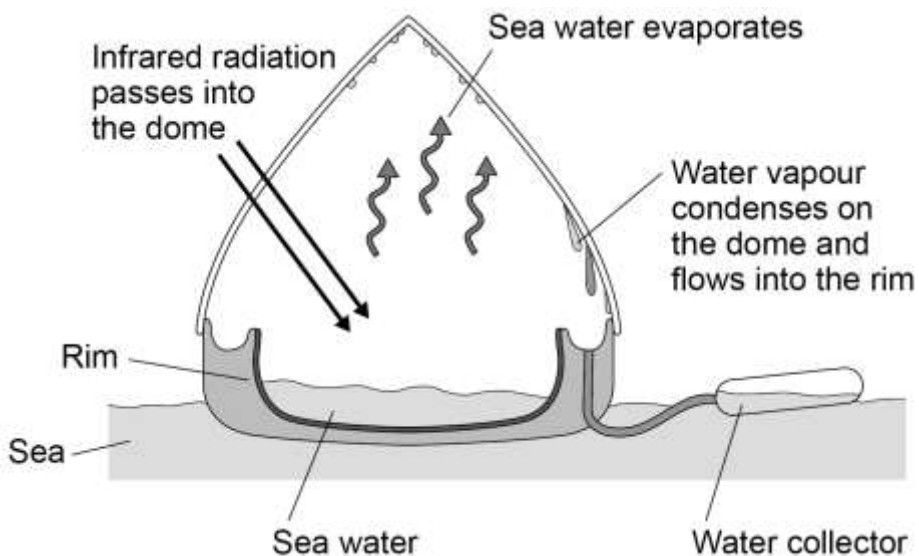
SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. Figure 11 shows a solar still. A solar still is used to purify salt water in areas where there is not much fresh water for drinking. Energy from the Sun causes the water to evaporate. The water vapour then condenses on the dome and flows into the rim of the solar still.

Figure 11



1.1 Explain how evaporation and condensation take place in the solar still.

Refer to the water particles in your answer.

[4 marks]

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1.2 The specific latent heat of vaporisation of water is 2.3×10^6 J/kg.

Calculate the energy required to produce 2.5 kg of fresh water.

Give your answer to 2 significant figures.

Use the Physics equation sheet.

[2 marks]

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Energy = J

1.3 One disadvantage of this process is that it takes a long time to collect the fresh water.

Suggest **two ways** to improve the design of the solar still so that it takes less time to collect the fresh water.

[2 marks]

Improvement 1

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Improvement 2

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FEEDBACK SHEET

Overall Mark:	/30	GRADE ACHIEVED:	
Section A :	/9	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B :	/13	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C :	/8	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

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|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning. | <ul style="list-style-type: none"> <input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. <p>Other:</p> |
|--|--|

Student response



TASK 4: GASES

SPEC CHECK

Content	Achieved?
The molecules of a gas are in constant random motion. The temperature of the gas is related to the average kinetic energy of the molecules.	
Changing the temperature of a gas, held at constant volume, changes the pressure exerted by the gas.	
Students should be able to: <ul style="list-style-type: none"> • Explain how the motion of the molecules in a gas is related to both its temperature and its pressure 	
Students should be able to: <ul style="list-style-type: none"> • Explain qualitatively the relation between the temperature of a gas and its pressure at constant volume. 	
A gas can be compressed or expanded by pressure changes. The pressure produces a net force at right angles to the wall of the gas container (or any surface).	
Students should be able to use the particle model to explain how increasing the volume in which a gas is contained, at constant temperature, can lead to a decrease in pressure	
For a fixed mass of gas held at a constant temperature: pressure \times volume = constant $p V = \text{constant}$ pressure, p , in pascals, Pa volume, V , in metres cubed, m^3	
Students should be able to calculate the change in the pressure of a gas or the volume of a gas (a fixed mass held at constant temperature) when either the pressure or volume is increased or decreased.	
Work is the transfer of energy by a force.	
Doing work on a gas increases the internal energy of the gas and can cause an increase in the temperature of the gas.	
Students should be able to explain how, in a given situation e.g. a bicycle pump, doing work on an enclosed gas leads to an increase in the temperature of the gas.	



SECTION A

This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. A student uses a kettle to determine the specific heat capacity of water.

The student placed different masses of water into the kettle and timed how long it took for the water to reach boiling point.

The student carried out the experiment three times.

The student's results are shown in **Table 2**.

Table 2

Mass of water in kg	Time for water to boil in seconds				Mass × change in temperature in kg°C	Energy supplied in kJ
	1	2	3	Mean		
0.25	55	60	63	59	20	131
0.50	105	110	116	110	40	243
0.75	140	148	141	143	60	314
1.00	184	190	183	182	80	401
1.25	216	215	211	214	100	471
1.50	272	263	266	267	120	587
1.75	298	300	302		140	

1.1 Suggest how the student was able to ensure that the change in temperature was the same for each mass of water.

[2 marks]

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1.2 Calculate the uncertainty in the student's measurements of time to boil when the mass of water was 1.75 kg.

[2 marks]

.....
.....

Uncertainty = \pm s

1.3 The power rating of the kettle is 2.20 kW.

Calculate the average electrical energy used by the kettle, in kJ, for 1.75 kg of water to reach boiling point.

[2 marks]

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.....

Average energy = kJ

1.4 Use information from **Table 2** to calculate the change in temperature of the water during the investigation.

[2 marks]

.....
.....

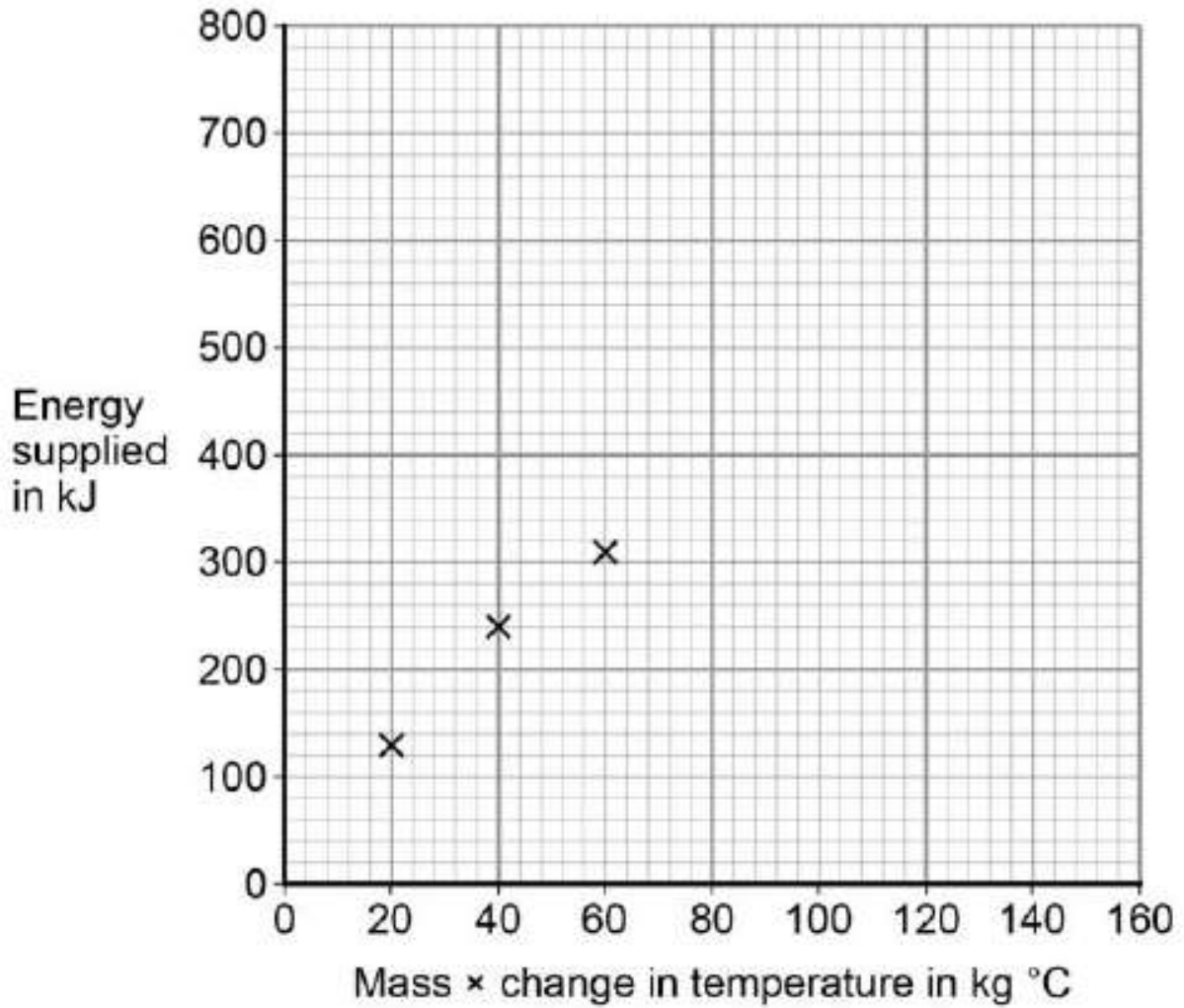
Change in temperature = °C



The student plotted a graph of energy supplied in kJ against mass \times change in temperature in kg $^{\circ}\text{C}$.

Figure 7 shows the graph the student plotted.

Figure 7



1.5 Use data from **Table 2** to plot the four missing points.

Draw a line of best fit on the graph.

[3 marks]



1.6 Use the graph to determine the mean value of the specific heat capacity of water, for the student's investigation.

[4 marks]

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Specific Heat Capacity of Water = J/kg °C

1.7 The student's value for the specific heat capacity of water was greater than the accepted value.

Suggest why.

[1 mark]

.....

.....

1.8 The kettle used in the experiment had a label stating that the power rating of the kettle was 2.2 kW.

The student did not measure the power of the kettle.

Suggest why measuring the power of the kettle may improve the student's investigation.

[1 mark]

.....

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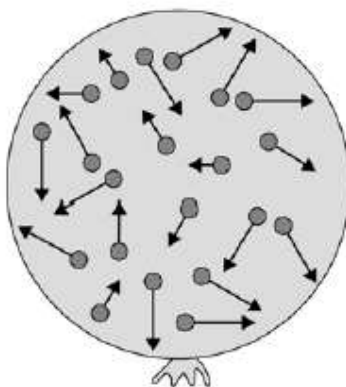
SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. Figure 1 shows a balloon filled with helium gas.

Figure 1



1.1 Describe the movement of the particles of helium gas inside the balloon.

[2 marks]

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1.2 What name is given to the total kinetic energy and potential energy of all the particles of helium gas in the balloon?

[1 mark]

Tick **one** box.

External energy

Internal energy

Movement energy



1.3 Write down the equation which links density, mass and volume.

[1 mark]

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.....

1.4 The helium in the balloon has a mass of 0.00254 kg.

The balloon has a volume of 0.0141 m³.

Calculate the density of helium. Include a unit with your answer.

[3 marks]

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Density = Unit:



SECTION C

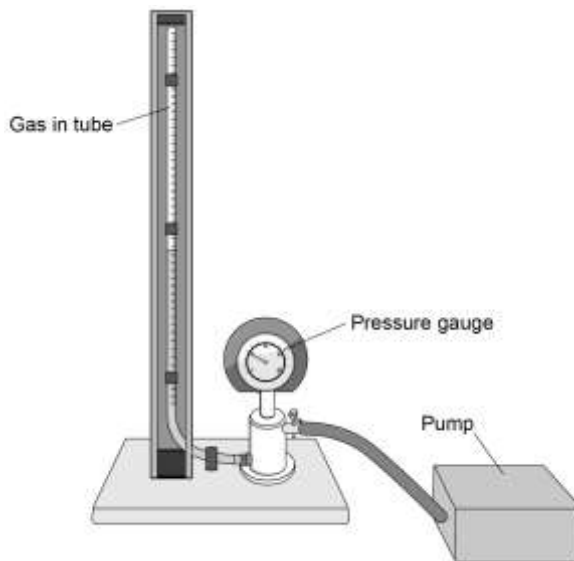
This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. A student investigated how the pressure exerted by a gas varied with the volume of the gas.

Figure 12 shows the equipment the student used.

Figure 12



A pump was used to compress the gas in a tube. As the volume of the gas decreases, the pressure of the gas increases.

1.1 The student only recorded one set of results.

Give **two** reasons why taking repeat readings could provide more accurate data.

[2 marks]

Reason **1**

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.....

Reason **2**

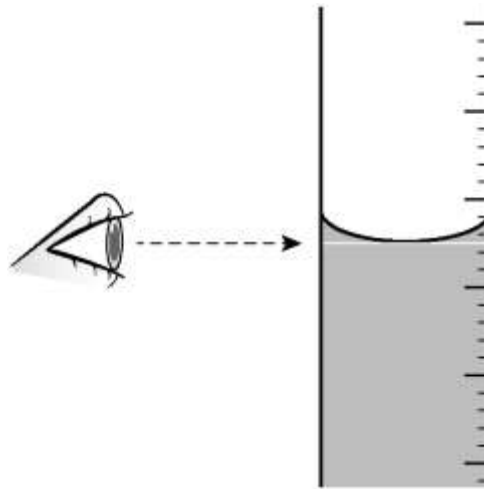
.....

.....



1.2 Figure 13 shows the position of the student's eye when taking volume measurements.

Figure 13



Explain what type of error would be caused if the student's eye was not in line with the level of the liquid in the tube.

[2 marks]

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1.3 If the gas is compressed too quickly the temperature of the gas increases.

Explain how the temperature increase would affect the pressure exerted by the gas.

[2 marks]

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1.4 One of the student's results is given below.

Pressure = 1.6×10^5 Pa

Volume = 9.0 cm^3

Calculate the volume of the gas when the pressure was 1.8×10^5 Pa.

The temperature of the gas was constant.

[3 marks]

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Volume = cm^3

Figure 14 shows a person using a bicycle pump to inflate a tyre.

Figure 14



1.5 The internal energy of the air increases as the tyre is inflated.

Explain why.

[2 marks]

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FEEDBACK SHEET

Overall Mark:	/35	GRADE ACHIEVED:	
Section A :	/17	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B :	/7	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C :	/11	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning. | <ul style="list-style-type: none"> <input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. <p>Other:</p> |
|--|--|

Student response



GCSE Physics Equation Sheet

1	pressure due to a column of liquid = height of column \times density of liquid \times gravitational field strength (g)	$p = h \rho g$
2	(final velocity) ² - (initial velocity) ² = 2 \times acceleration \times distance	$v^2 - u^2 = 2 a s$
3	force = $\frac{\text{change in momentum}}{\text{time taken}}$	$F = \frac{m \Delta v}{\Delta t}$
4	elastic potential energy = 0.5 \times spring constant \times (extension) ²	$E_e = \frac{1}{2} k e^2$
5	change in thermal energy = mass \times specific heat capacity \times temperature change	$\Delta E = m c \Delta \theta$
6	period = $\frac{1}{\text{frequency}}$	
7	magnification = $\frac{\text{image height}}{\text{object height}}$	
8	force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density \times current \times length	$F = B I l$
9	thermal energy for a change of state = mass \times specific latent heat	$E = m L$
10	$\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$
11	potential difference across primary coil \times current in primary coil = potential difference across secondary coil \times current in secondary coil	$V_s I_s = V_p I_p$
12	For gases: pressure \times volume = constant	$p V = \text{constant}$



Acknowledgements

This document has been produced by Mr J Turnbull.

All relevant information has been credited in the document.

This document has been produced for educational purposes only.

This document has been produced for the AQA GCSE Science Specification.

