ST MARY'S SCIENCE DEPARTMENT:

PHYSICS

F

GCSE PHYSICS **HOMEWORK BOOK**
TOPIC 1: ADVANCED ENERGY
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 9

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 Specific Heat Capacity 1			
Task 2 Specific Heat Capacity 2			
Task 3 Insulation			
Task 4 Elastic Energy			

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: SPECIFIC HEAT CAPACITY 1

SPEC CHECK

Content	Achieved?
The amount of energy stored in or released from a system as its temperature changes can be calculated using the equation: change in thermal energy = mass× specific heat capacity × temperature change $\Delta E = m c \Delta \theta$ change in thermal energy, ΔE, in joules, J mass, m, in kilograms, kg specific heat capacity, c, in joules per kilogram per degree Celsius, J/kg °C temperature change, Δθ, in degrees Celsius, °C	
The specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.	

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. A weightlifter picks up a barbell.

1.1 Which type of energy is stored in the barbell when it is held above the weightlifter's head?

Tick **one** box only.

[1 mark]

- Chemical potential ☐
- Elastic potential ☐
- Gravitational potential ☐
- Kinetic ☐

1.2 The weightlifter drops the barbell.

The barbell's store of which type of energy increases as the barbell falls.

Tick **one** box only.

[1 mark]

- Chemical potential ☐
- Elastic potential ☐
- Gravitational potential ☐
- Kinetic ☐

1.3 The weightlifter drops the barbell.

The barbell's store of which type of energy decreases as the barbell falls.

Tick **one** box only.

[1 mark]

- Chemical potential ☐
- Elastic potential ☐
- Gravitational potential ☐
- Kinetic ☐

1.4 The weightlifter drops the barbell.

What happens to the overall energy of the system as it falls. Assume the system is closed

Tick **one** box only.

[1 mark]

- Increases ☐
- Decreases ☐
- Stays the same ☐
- Goes to zero. ☐

1.5 The weightlifter drops the barbell.

What happens to the internal energy of the surroundings as it falls. Assume the system is open.

Tick **one** box only.

[1 mark]

- Increases ☐
- Decreases ☐
- Stays the same ☐
- Goes to zero. ☐

1.6 State the unit of energy.

Tick **one** box only.

[1 mark]

- Joules ☐
- Newtons ☐
- Watts ☐
- Kilograms ☐

1.7 State the efficiency value which is impossible to achieve in the Universe.

Tick **one** box only.

[1 mark]

- 95% ☐
- 0.78 ☐
- 1.21 ☐
- 22% ☐

1.8 A motor transfers 10,000J of energy in 25 seconds. What is the power?

Tick **one** box only.

[1 mark]

- 10,000W ☐
- 250,000W ☐
- 400W ☐
- 40,000W ☐

SECTION B

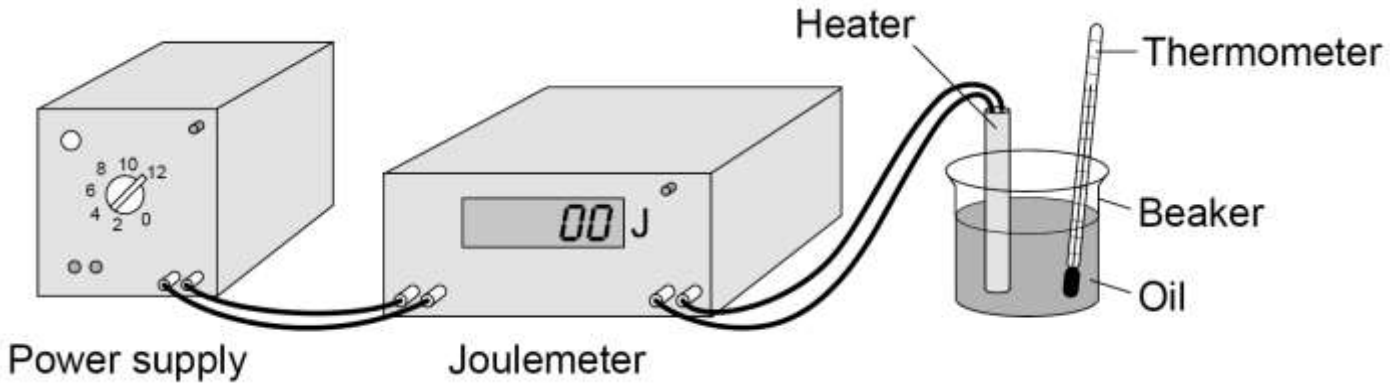
This is a question to revise understanding carried out in lesson.

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

1. Students investigated the specific heat capacity of different oils.

Figure 2 shows the equipment used.

Figure 2



This is the method used:

1. Put 200 g of an oil in a beaker.

2. Record the temperature of the oil.

3. Switch on the heater.

4. After 5 minutes, record the temperature of the oil and the reading on the joulemeter.

5. Repeat steps **1–4** with different oils.

1.1 Give one variable the students controlled in the investigation.

[1 mark]

Table 2 shows the students' results for one oil.

Table 2

Temperature at start in °C	Temperature after 5 minutes in °C
21	68

1.2 What is the resolution of the thermometer used in the investigation?

[1 mark]

Resolution = ... °C

The students calculated the specific heat capacity of the oil as 2100 J/kg °C

The correct value for the specific heat capacity for the oil is 1630 J/kg °C

1.3 Calculate the percentage difference between the two values.

[2 marks]

.....

.....

Percentage difference = ... %

1.4 Suggest **two** improvements the students could make to obtain a more accurate value for the specific heat capacity.

[2 marks]

Improvement **1**

.....

.....

Improvement **2**

.....

.....

1.5 A company is considering what metal to use to make saucepans.

They use data about the:

Cost of each metal

Specific heat capacity of each metal.

Suggest **two other** properties the company needs to consider when deciding which metal to use.

[2 marks]

Property **1**

.....

.....

Property **2**

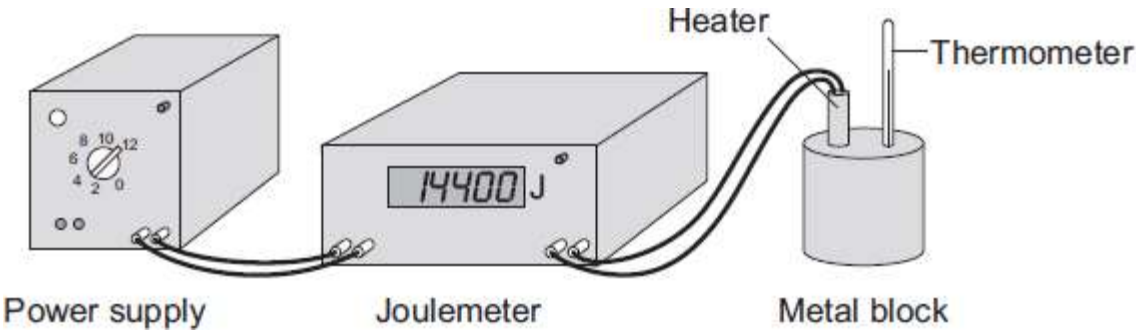
.....

.....

SECTION C
This is a revision question to consolidate your understanding.

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

1. A student used an electric heater to heat a metal block. The student measured the energy input to the heater with a joulemeter.



Before starting the experiment, the student reset the joulemeter to zero. The student switched the power supply on for exactly 10 minutes. During this time, the reading on the joulemeter increased to 14 400.

1.1 Calculate the energy transferred each second from the power supply to the heater.

Show clearly how you work out your answer.

[2 marks]

.....

.....

Energy Transferred Each Second = _____ J/s

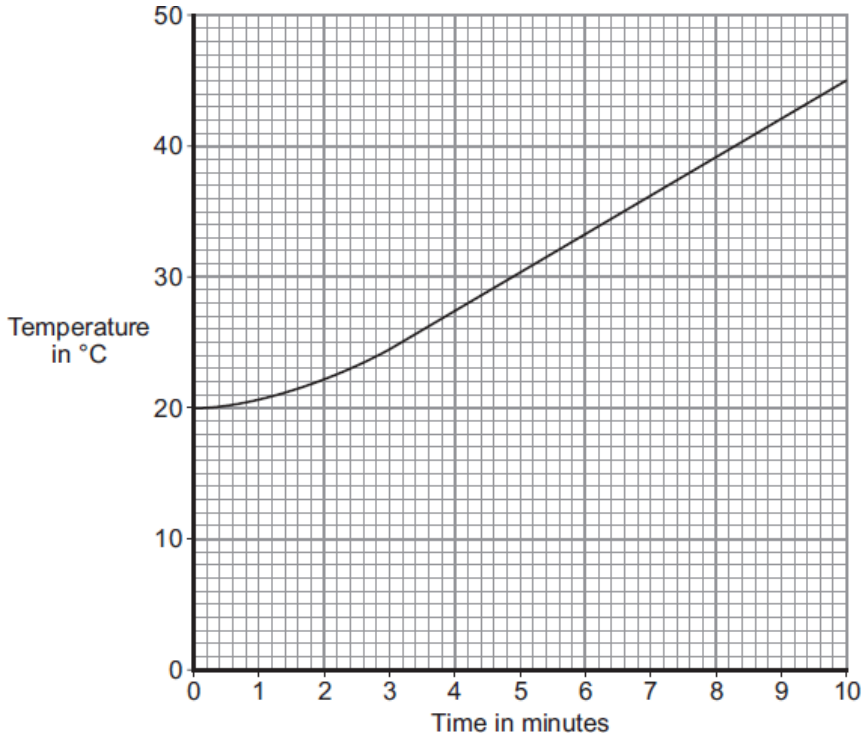
1.2 What is the power of the heater?

[1 Mark]

.....

.....

The student measured the temperature of the metal block every minute. The data obtained by the student is displayed in the graph.



1.3 What range of temperatures did the student measure?

[1 Mark]

From _____ °C to _____ °C

1.4 Before starting the experiment, the student had calculated that the temperature of the block would go up by 36 °C.

The student's data shows a smaller increase.

Which **one** of the following statements gives the most likely reason for this?

Put a tick (✓) in the box next to your answer.

[1 Mark]

The student does not read the thermometer accurately.	☐
The block transfers energy to the surroundings.	☐
The power supply is not connected correctly to the joulemeter.	☐

FEEDBACK SHEET

Overall Mark:	**/21**	**GRADE ACHIEVED:**	
Section A :	/8	**9** ☐	**5** ☐
Section B :	/8	**8** ☐	**4** ☐
Section C :	/5	**7** ☐	**3** ☐
		6 ☐	**U** ☐

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding

Strengths:	☐ Basic Knowledge of Concepts ☐ Quality of Written Communication ☐ Working Scientifically ☐ Answering Examination Questions ☐ Analytical Skills **Others** (Topic Specific)	☐ Applications of Concepts ☐ Mathematical Skills ☐ Experimental Technique ☐ Previous Topics ☐ Problem Solving
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Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	**(your target)**
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

☐ Carry out **independent** revision. ☐ Complete outstanding work. ☐ Make corrections as indicated by the teacher. ☐ Attend intervention for this topic ☐ Include more information in responses. ☐ Include more key words in responses. ☐ Attend departmental revision sessions. ☐ Read the questions carefully. ☐ Explain your answers in more detail. ☐ Carry out revision on Seneca Learning.	☐ Revise the equations. ☐ Check the units on answers. ☐ Check the correct amount of sig figs on answers. ☐ Check to convert values correctly. ☐ Show your full working out. ☐ Check your calculations. ☐ Revise the science investigative skills. ☐ Revise the key concepts of the topics. ☐ Thoroughly check your work for mistakes. Other:

Student response

TASK 2: SPECIFIC HEAT CAPACITY 2

SPEC CHECK

Content	Achieved?
The amount of energy stored in or released from a system as its temperature changes can be calculated using the equation: change in thermal energy = mass× specific heat capacity × temperature change $\Delta E = m c \Delta \theta$ change in thermal energy, ΔE, in joules, J mass, m, in kilograms, kg specific heat capacity, c, in joules per kilogram per degree Celsius, J/kg °C temperature change, Δθ, in degrees Celsius, °C	
The specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.	

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?

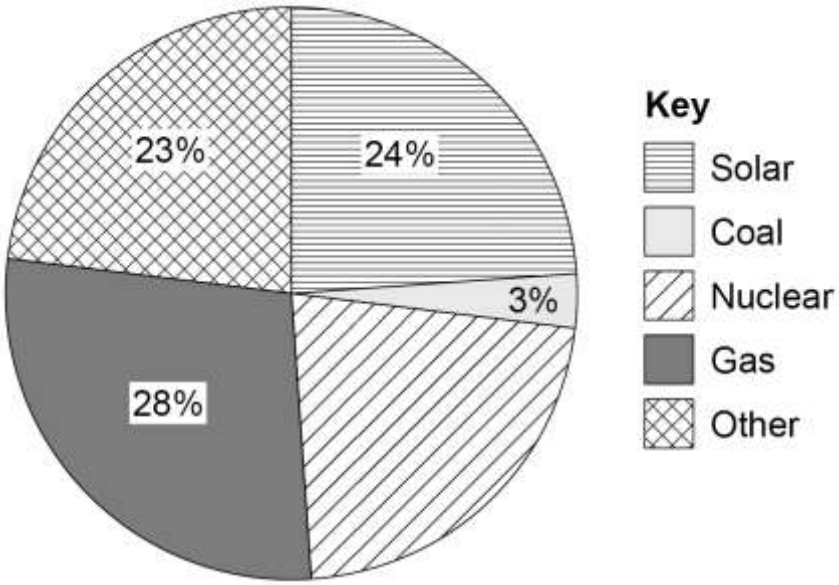
SECTION A

This is a revision question on a previous topic.

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

1. Figure 6 shows how different energy resources were used in the United Kingdom (UK) to generate electricity on one day in June 2018.

Figure 6



1.1 The UK government plans to stop using coal-fired power stations by 2025.

Explain **one** environmental problem caused when electricity is generated by burning coal.

[2 marks]

.....

.....

1.2 Give **two** renewable energy resources that could make up the 'Other' energy resources in **Figure 6**.

[2 marks]

Resource **1**

.....

.....

Resource **2**

.....

.....

1.3 Determine the percentage of electricity generated in nuclear power stations that day.

Use data from **Figure 6**.

[2 marks]

.....

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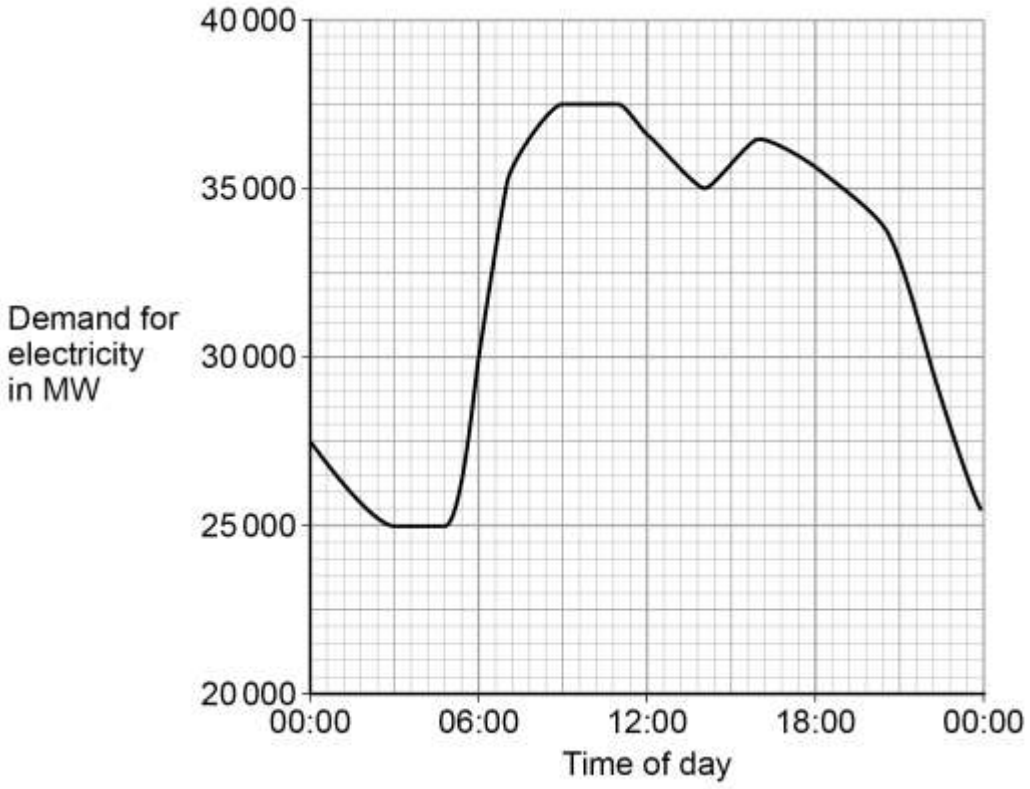
.....

Percentage of Electricity Generated in Nuclear Power Stations =..... %

Figure 7 shows how the demand for electricity varied with the time of day.

Figure 7



1.4 What was the difference between the maximum demand and minimum demand for electricity during this day?

[2 marks]

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.....

.....

Difference =..... MW

1.5 Figure 7 shows that the demand for electricity increased between 06:00 and 09:00

Solar power could have met the demand if there were enough solar panels installed in the UK.

Explain why.

[2 marks]

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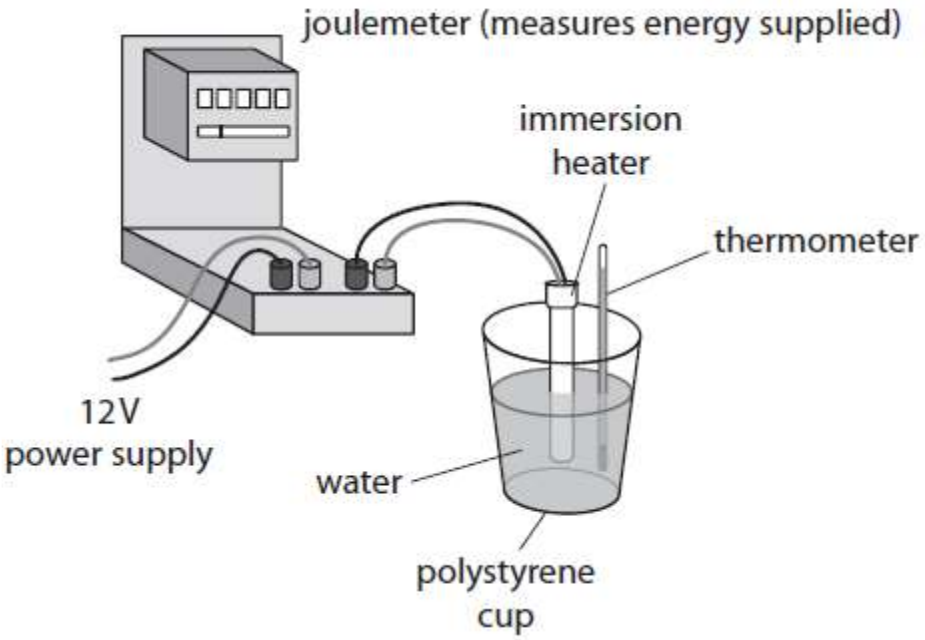
SECTION B

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

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

1. A student uses the apparatus in **Figure 3** to determine the specific heat capacity of water.

Figure 3



1.1 State the measurements needed to calculate the specific heat capacity of water.

[4 Marks]

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.....

.....

1.2 State two ways that the apparatus could be adapted to improve the procedure.

[2 Marks]

Adaptation **1**

.....

.....

Adaptation **2**

.....

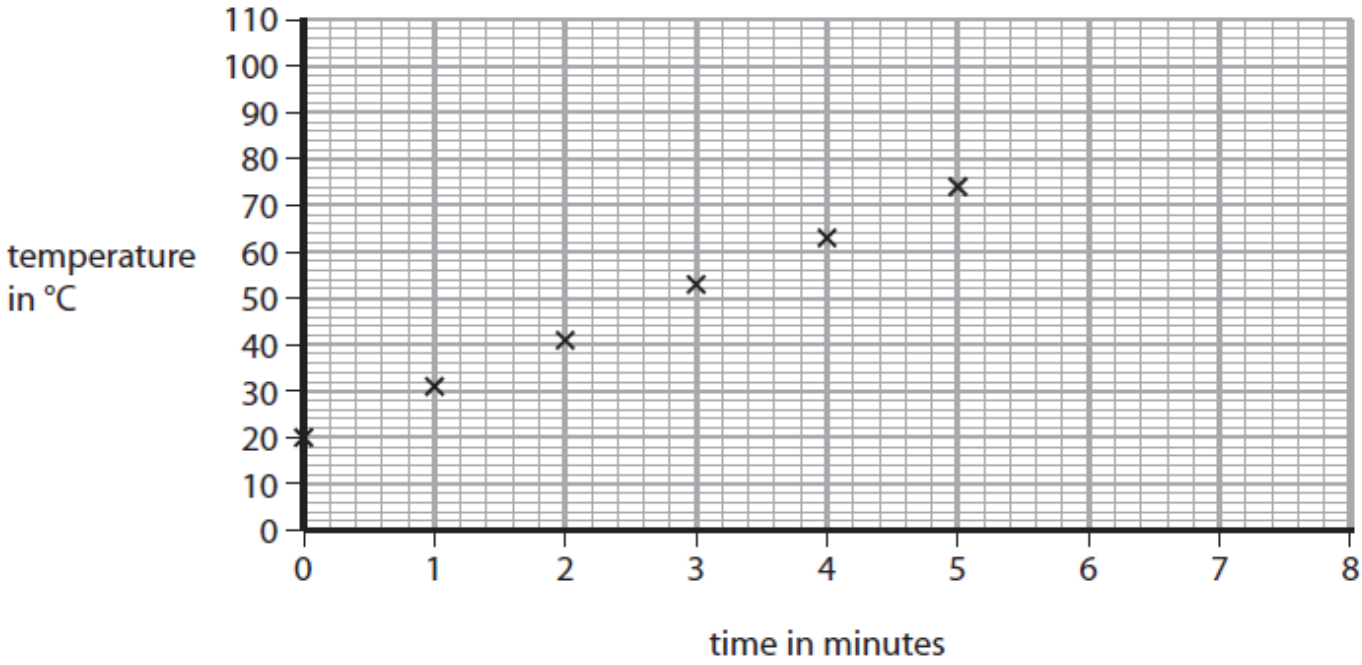
.....

The student decides to measure the temperature of the water every minute while

it is being heated.

Figure 4 shows a graph of the student's results.

Figure 4



1.3 Predict the temperature of the water if the heating continues up to 8 minutes.

[1 Mark]

.....

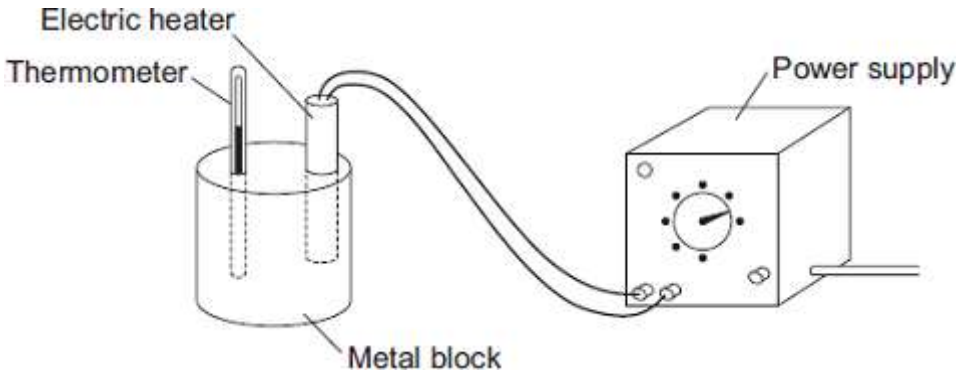
.....

Temperature of the Water = ... °C

SECTION C
This is a revision question to consolidate your understanding.

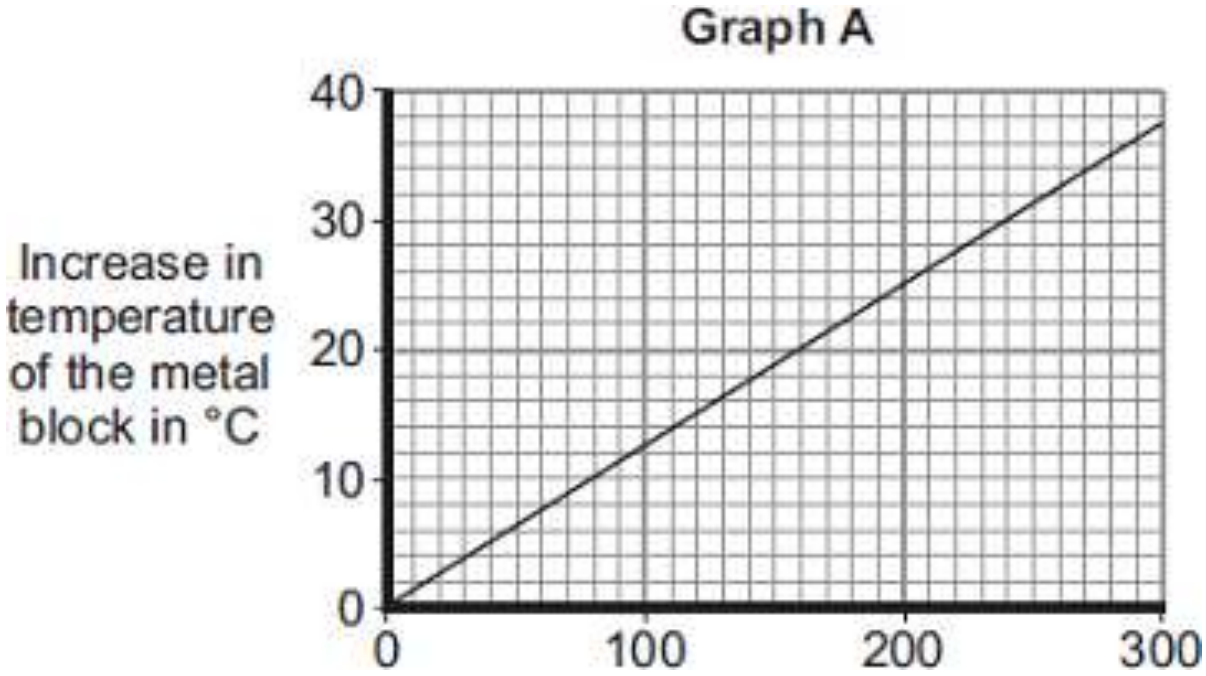
You should aim to spend **10 minutes** answering this section

1. A student used the apparatus drawn below to investigate the heating effect of an electric heater.



1.1 Before starting the experiment, the student drew **Graph A**.

Graph A shows how the student expected the temperature of the metal block to change after the heater was switched on.



Describe the pattern shown in **Graph A**.

[2 Marks]

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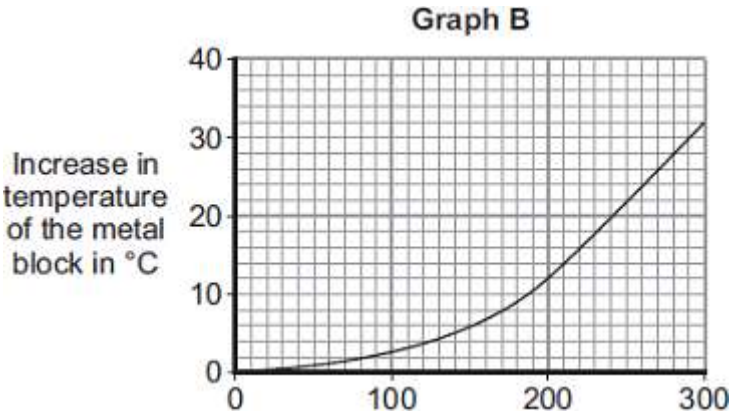
.....

The student measured the room temperature. He then switched the heater on and measured the temperature of the metal block every 50 seconds.

The student calculated the increase in temperature of the metal block and plotted **Graph B**.



1.2 After 300 seconds, **Graph B** shows the increase in temperature of the metal block is lower than the increase in temperature expected from **Graph A**.

Suggest **one** reason why.

[1 Mark]

.....

.....

1.3 The power of the electric heater is 50 watts.

Calculate the energy transferred to the heater from the electricity supply in 300 seconds.

[2 Marks]

.....

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.....

.....

Energy Transferred = _____ J

The student uses the same heater to heat blocks of different metals. Each time the heater is switched on for 300 seconds.

Each block of metal has the same mass but a different specific heat capacity.

Metal	Specific heat capacity in J/kg°C
Aluminium	900
Iron	450
Lead	130

1.4 Which **one** of the metals will heat up the most?

Draw a ring around the correct answer.

aluminium **iron** **lead**

Give, in terms of the amount of energy needed to heat the metal blocks, a reason for your answer.

[2 Marks]

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FEEDBACK SHEET

Overall Mark:	**/24**	**GRADE ACHIEVED:**	
Section A :	/10	**9** ☐	**5** ☐
Section B :	/7	**8** ☐	**4** ☐
Section C :	/7	**7** ☐	**3** ☐
		6 ☐	**U** ☐

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding

Strengths:	☐ Basic Knowledge of Concepts ☐ Quality of Written Communication ☐ Working Scientifically ☐ Answering Examination Questions ☐ Analytical Skills **Others** (Topic Specific)	☐ Applications of Concepts ☐ Mathematical Skills ☐ Experimental Technique ☐ Previous Topics ☐ Problem Solving
Areas to Improve:	☐ Basic Knowledge of Concepts ☐ Quality of Written Communication ☐ Working Scientifically ☐ Answering Examination Questions ☐ Analytical Skills **Others** (Topic Specific)	☐ Applications of Concepts ☐ Mathematical Skills ☐ Experimental Technique ☐ Previous Topics ☐ 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:

☐ Carry out **independent** revision. ☐ Complete outstanding work. ☐ Make corrections as indicated by the teacher. ☐ Attend intervention for this topic ☐ Include more information in responses. ☐ Include more key words in responses. ☐ Attend departmental revision sessions. ☐ Read the questions carefully. ☐ Explain your answers in more detail. ☐ Carry out revision on Seneca Learning.	☐ Revise the equations. ☐ Check the units on answers. ☐ Check the correct amount of sig figs on answers. ☐ Check to convert values correctly. ☐ Show your full working out. ☐ Check your calculations. ☐ Revise the science investigative skills. ☐ Revise the key concepts of the topics. ☐ Thoroughly check your work for mistakes. Other:

Student response

TASK 3: INSULATION

SPEC CHECK

Content	Achieved?
Energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed.	
Students should be able to describe with examples where there are energy transfers in a closed system, that there is no net change to the total energy.	
Students should be able to describe, with examples, how in all system changes energy is dissipated, so that it is stored in less useful ways. This energy is often described as being 'wasted'.	
Students should be able to explain ways of reducing unwanted energy transfers, for example through lubrication and the use of thermal insulation.	

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?

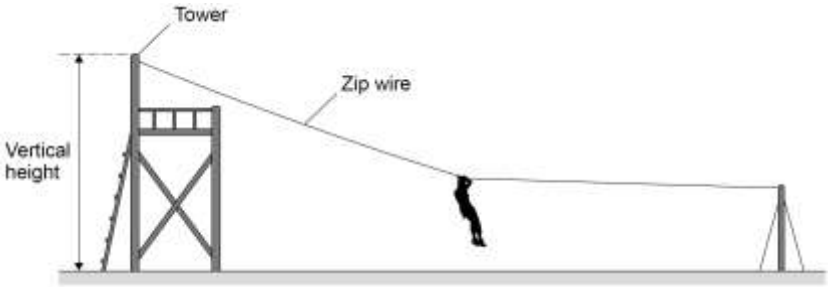
SECTION A

This is a revision question on a previous topic.

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

1.1 Figure 4 shows a person sliding down a zip wire.

Figure 4



1.1 Describe how the vertical height of the tower could be measured accurately.

[2 marks]

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.....

.....

.....

1.2 When using the zip wire, the person moved through a vertical height of 2.0 m

The person has a mass of 45 kg

gravitational field strength = 9.8 N/kg

Calculate the change in gravitational potential energy of the person.

Use the equation:

gravitational potential energy = mass × gravitational field strength × height

[2 marks]

.....

.....

.....

.....

Change in Gravitational Potential Energy =..... J

1.3 Give **three** factors that affected the kinetic energy of the person as she reached the bottom of the zip wire.

[3 marks]

Factor **1**

.....

.....

Factor **2**

.....

.....

Factor **3**

.....

.....

SECTION B

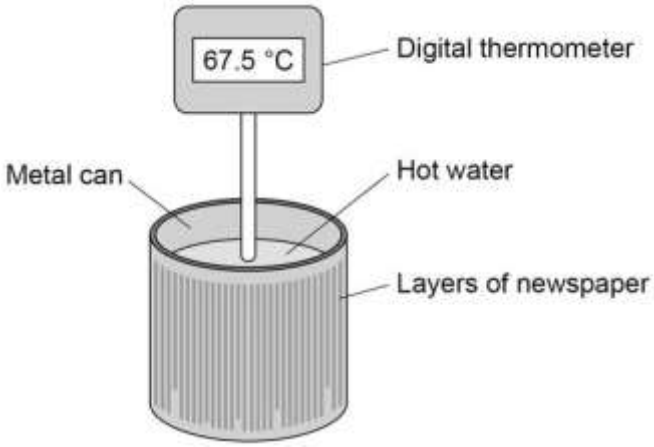
This is a question to revise understanding carried out in lesson.

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

1. A student investigated the insulating properties of newspaper.

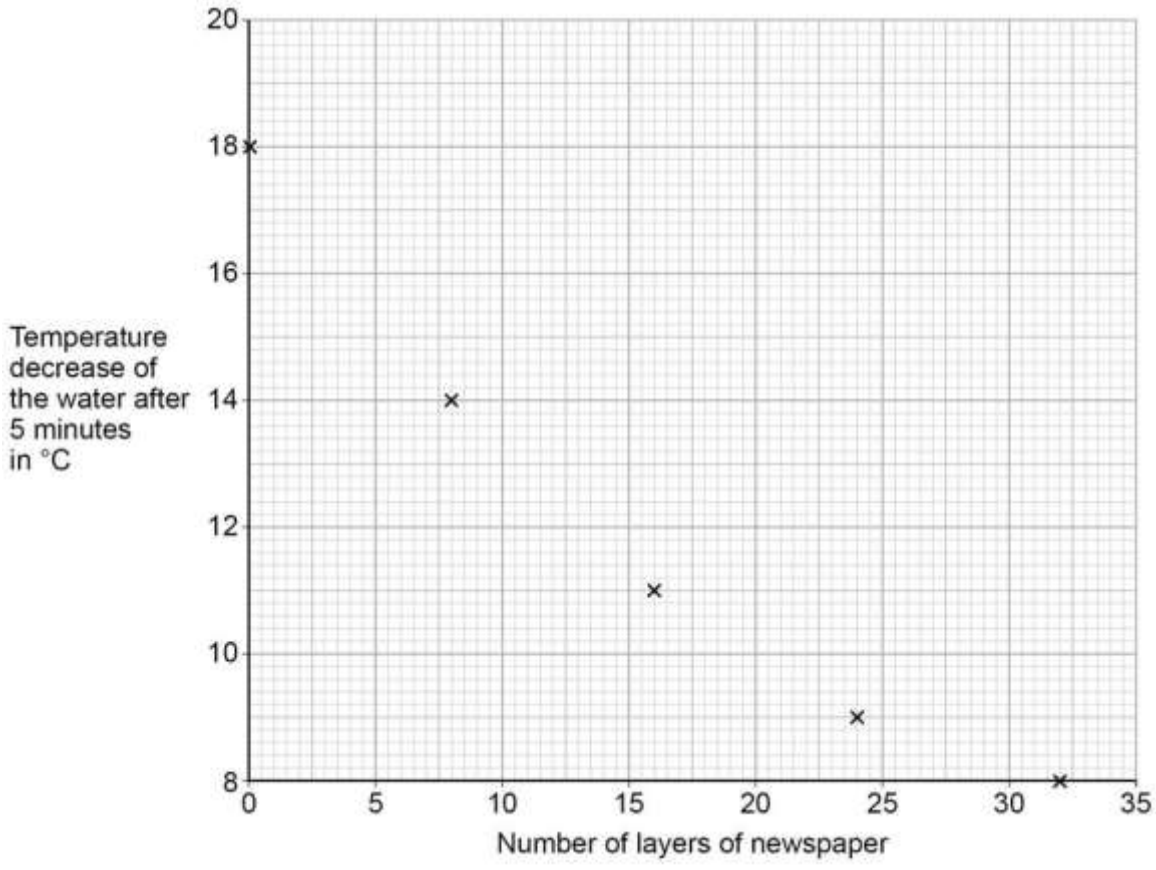
Figure 1 shows the apparatus the student used.

Figure 1



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

Figure 2



1.1 Describe a method the student could have used to obtain the results shown in **Figure 2.**

[6 marks]

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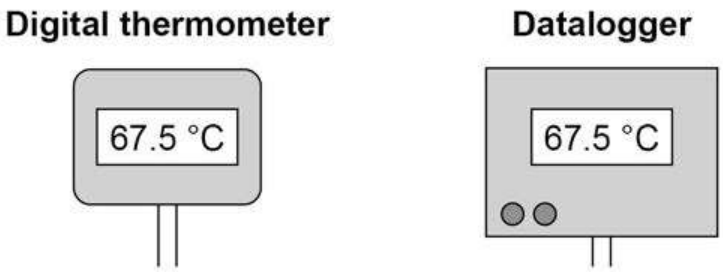
1.2 The student could have used a datalogger with a temperature probe instead of the digital thermometer.

Figure 3 shows the readings on the digital thermometer and the datalogger.

Figure 3



The datalogger records 10 readings every second.

The student considered using a temperature probe and datalogger.

Explain why it was not necessary to use a temperature probe and datalogger for this investigation.

[2 marks]

.....

.....

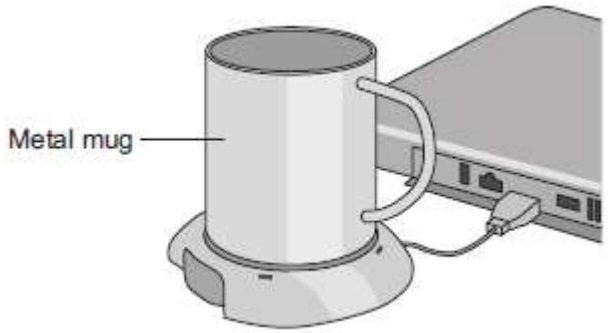
.....

SECTION C
This is a revision question to consolidate your understanding.

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

1. A heater uses energy from a laptop computer to keep a drink hot.

The image shows a metal mug on the heater.



1.1 The laptop computer is operating on battery power.
How would connecting the heater affect the amount of time the laptop computer would operate for, before needing to be recharged?

Tick **one** box.

[1 mark]

	Tick (✔)
it would decrease the time	
it would not affect the time	
it would increase the time	

1.2 The power output from the heater is 12 W.

Calculate the energy transferred to the metal mug in 60 seconds.

[2 marks]

.....

.....

.....

Energy = _____ joules

1.3 The table lists changes that may affect the energy transfer per second from the heater to the liquid.

Tick **one** box to show the effect of each change.

[3 marks]

Change	Energy transfer per second to the liquid		
	increases	**decreases**	**does not change**
use a mug with a smaller base			
use a lower power heater			
use a plastic mug instead of a metal mug			

FEEDBACK SHEET

Overall Mark:	**/21**	**GRADE ACHIEVED:**	
Section A :	/7	**9** ☐	**5** ☐
Section B :	/8	**8** ☐	**4** ☐
Section C :	/6	**7** ☐	**3** ☐
		6 ☐	**U** ☐

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
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☐ Include more key words in responses.	☐ Check your calculations.
☐ Attend departmental revision sessions.	☐ Revise the science investigative skills.
☐ Read the questions carefully.	☐ Revise the key concepts of the topics.
☐ Explain your answers in more detail.	☐ Thoroughly check your work for mistakes.
☐ Carry out revision on Seneca Learning.	Other:

Student response

TASK 4: ELASTIC ENERGY

SPEC CHECK

Content	Achieved?
The amount of elastic potential energy stored in a stretched spring can be calculated using the equation: elastic potential energy= 0.5× spring constant × extension ^{2} $E_e = 1/2\ k\ e^2$ (assuming the limit of proportionality has not been exceeded) elastic potential energy, Ee, in joules, J spring constant, k, in newtons per metre, N/m extension, e, in metres, m	

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. A homeowner had a new gas boiler installed.

The following information is an extract from the information booklet supplied with the boiler.

Fuel	Natural Gas
Water temperature	60 °C
Energy supplied to gas boiler	8.0 kJ/s (8.0 kW)
Efficiency	0.95

1.1 Calculate the energy transferred each second by the gas boiler to the water inside the boiler.

Show clearly how you work out your answer.

[2 Marks]

.....

.....

.....

Energy Transferred by the Gas Boiler Each Second = ... kJ

1.2 The energy value of the gas used in a home is measured in kilowatt-hours (kWh).

The homeowner has a pre-payment meter and pays £30 into his account. With a pre-payment meter, gas costs 15p per kilowatt-hour.

Calculate the total number of hours that the gas boiler would operate for £30.
Show clearly how you work out your answer.

[2 Marks]

.....

.....

.....

Number of Hours = ...

1.3 Although the gas boiler is very efficient, some energy is wasted.

Explain what happens to the waste energy.

[2 Marks]

.....

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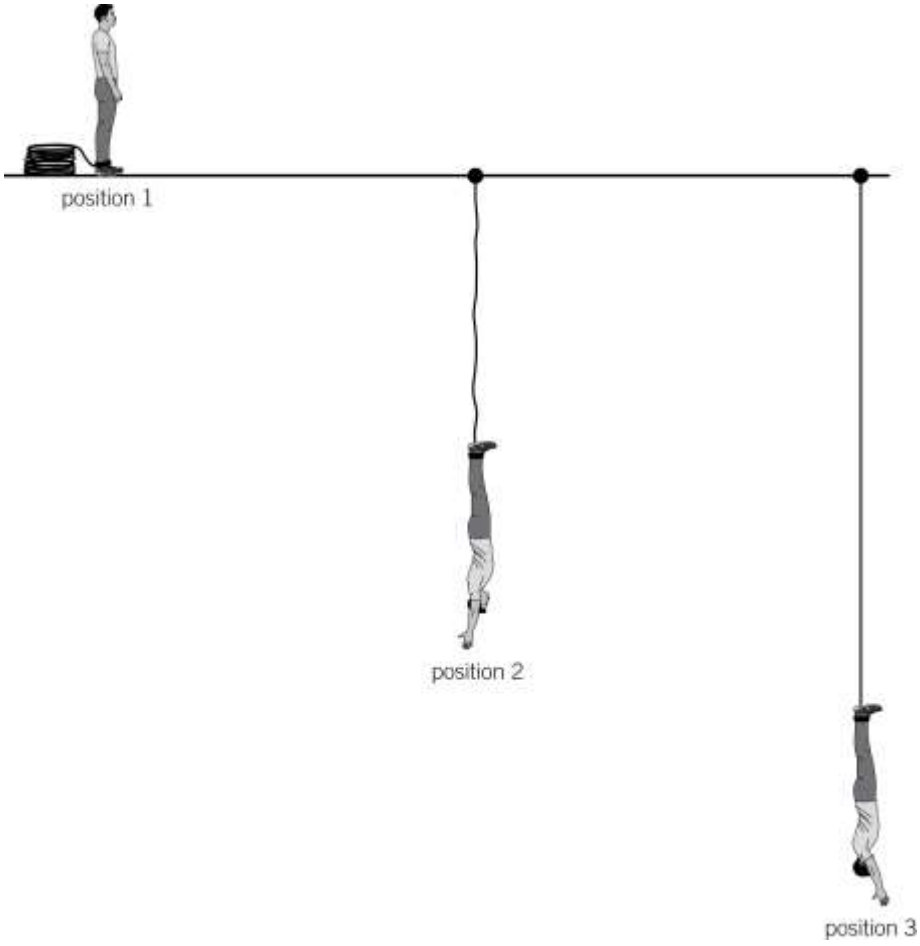
.....

SECTION B

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

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

1. The diagram shows a bungee jumper at three different positions: waiting to jump (position **1**), at the point where the bungee rope is fully unwound and about to start stretching (position **2**), and at the lowest point before he rebounds (position **3**).



1.1 In which of the three positions is the bungee jumper's gravitational potential energy store largest? Explain your answer.

[2 Marks]

.....

.....

.....

1.2 In which of the three positions is the bungee jumper's gravitational energy store smallest?

Explain your answer.

[2 Marks]

.....

.....

.....

1.3 In which of the three positions is the rope's elastic energy store largest? Explain your answer.

[2 Marks]

.....

.....

.....

1.4 Describe and explain the changes in the rope's elastic energy store as the jumper moves from position **1** to position **3**.

[5 Marks]

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1.5 Explain, in terms of energy transfer, why a bungee jumper eventually stops moving.

[3 Marks]

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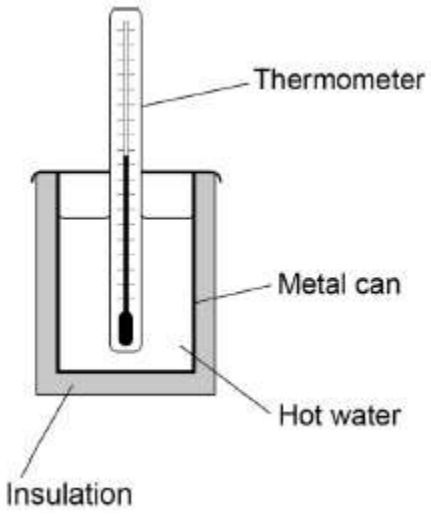
SECTION C
This is a revision question to consolidate your understanding.

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

1. A student investigated the properties of three insulating materials.

Figure 1 shows the apparatus the student used.

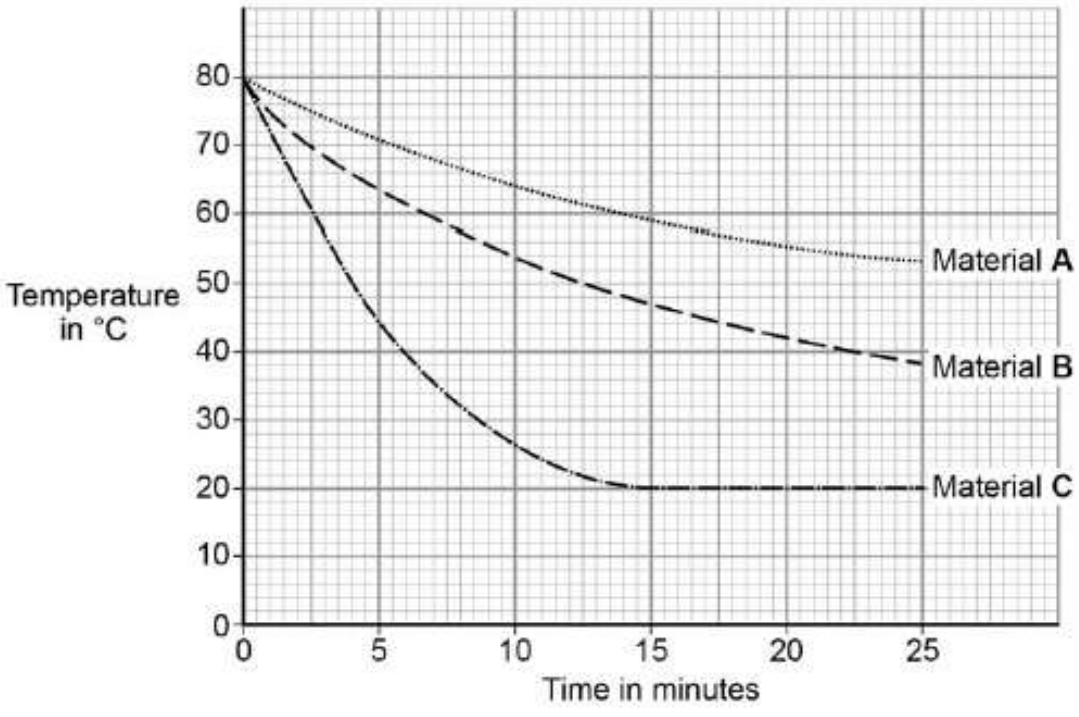
Figure 1



In the investigation, different insulating materials were used to insulate a metal can filled with hot water.

Figure 2 shows how the temperature measured by the thermometer changed over 25 minutes for each of the materials.

Figure 2



1.1 What was the temperature of the room where the student carried out the investigation?

Tick **one** box.

[1 Mark]

20 °C ☐ 38 °C ☐ 53 °C ☐ 80 °C ☐

1.2 Material **C** has the highest thermal conductivity.

How does the graph in **Figure 2** show this?

[1 Mark]

.....

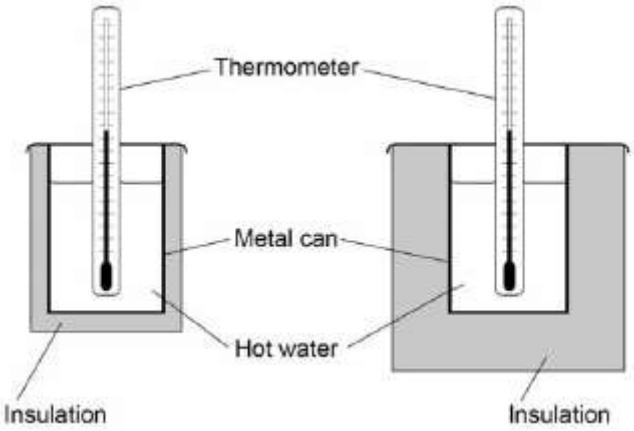
.....

.....

1.3 Another student repeated the investigation using the equipment shown in **Figure 3**.

Figure 1 shows the first set of equipment used.

Figure 1 **Figure 3**



Suggest how using the equipment in **Figure 3** will have affected the student's results.

[2 Marks]

.....

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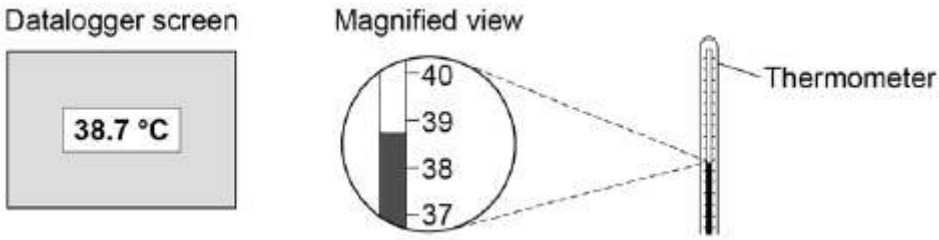
.....

1.4 The students could have used a temperature probe and datalogger instead of a thermometer.

Figure 4 shows the datalogger screen and the thermometer.

Figure 4



Complete the sentences.

Choose the answers from the box.

[2 Marks]

higher	**lower**	**the same**

Compared to the thermometer, the datalogger and temperature probe have a resolution that is _____ .

Compared to the thermometer, the chance of misreading the datalogger and temperature probe is _____ .

1.5 The table gives information about four types of insulation that could be used in the walls of houses.

Type of insulation	**Thermal conductivity in W/m °C**
Felt wool	0.070
Mineral wool	0.040
Polyurethane foam	0.030
Rock wool	0.045

Which type of insulation would be most effective in reducing the rate of cooling of a building?

Tick **one** box.

Felt wool ☐

Mineral wool ☐

Polyurethane foam ☐

Rock wool ☐

Give a reason for your answer.

[2 Marks]

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FEEDBACK SHEET

Overall Mark:	**/28**	**GRADE ACHIEVED:**	
Section A :	/6	**9** ☐	**5** ☐
Section B :	/14	**8** ☐	**4** ☐
Section C :	/8	**7** ☐	**3** ☐
		6 ☐	**U** ☐

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding

Strengths:	☐ Basic Knowledge of Concepts ☐ Quality of Written Communication ☐ Working Scientifically ☐ Answering Examination Questions ☐ Analytical Skills **Others** (Topic Specific)	☐ Applications of Concepts ☐ Mathematical Skills ☐ Experimental Technique ☐ Previous Topics ☐ Problem Solving
Areas to Improve:	☐ Basic Knowledge of Concepts ☐ Quality of Written Communication ☐ Working Scientifically ☐ Answering Examination Questions ☐ Analytical Skills **Others** (Topic Specific)	☐ Applications of Concepts ☐ Mathematical Skills ☐ Experimental Technique ☐ Previous Topics ☐ 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:

☐ Carry out **independent** revision. ☐ Complete outstanding work. ☐ Make corrections as indicated by the teacher. ☐ Attend intervention for this topic ☐ Include more information in responses. ☐ Include more key words in responses. ☐ Attend departmental revision sessions. ☐ Read the questions carefully. ☐ Explain your answers in more detail. ☐ Carry out revision on Seneca Learning.	☐ Revise the equations. ☐ Check the units on answers. ☐ Check the correct amount of sig figs on answers. ☐ Check to convert values correctly. ☐ Show your full working out. ☐ Check your calculations. ☐ Revise the science investigative skills. ☐ Revise the key concepts of the topics. ☐ Thoroughly check your work for mistakes. Other:

Student response

AQA
Realising potential

GCSE Physics Equation Sheet

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

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.