GCSE

Combined Science: Trilogy

8464/P/1H Combined Science: Trilogy Physics Paper 1H

Report on the exam

Published: August 2025

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

Support and guidance from AQA

Our reports on the exams are part of a suite of support we offer to enhance your understanding of our assessments and your students' performance.

Mark ranges and award of grades

Grade boundaries and cumulative percentage grades are available on the results statistics page of our website.

Data Insights (replaces Enhanced Results Analysis)

Data Insights is our new powerful online platform designed to help schools analyse exam performance in detail. You can:

- View how your students' grades compare to previous years and to other AQA centres.
- Analyse average marks and grade distributions for specific subjects.
- Drill down into individual student performance across components, units, and assessment objectives.
- Use heatmaps to identify patterns in question performance, spot strengths and weaknesses, and inform teaching strategies.
- Download tailored reports to support post-results analysis and intervention planning.

For more information on Data Insights, log in through Centre Services.(Sign in to your AQA account). Take a look at our Data Insights Video , quick reference guide or Data Insights user guide which have helpful insights on how to analyse your data.

Professional development

Attend one of our feedback courses where you can review example responses from students and commentaries from our examiners.

Enhance your understanding of GCSE science mark schemes and how to apply them with our eLearning courses.

AQA resources

We explain common misunderstandings and mistakes that students make when answering exam questions, and provide top tips on good exam technique in our Teaching Guide.
Enhance your understanding of vital aspects of the GCSE science assessments using our dedicated Teacher training (Focus on Success) packs.

© 2024 AQA and its licensors. All rights reserved.

Contents

The below table is interactive. You can press the control button click on the title of the question to go directly to that page.

© 2024 AQA and its licensors. All rights reserved.

Overview

This paper is one of the six examined components for Combined Science: Trilogy. All of these papers follow a similar structure and test the same assessment objectives.

This paper has 70 marks available to students and is made up of six questions.

- Approximately 40% of marks assess AO1; 40% of marks assess AO2; and 20% of marks assess AO3.
- Approximately 40% of marks target Standard demand, 40% of marks target Standard/high demand and 20% of marks target High demand.

Questions 1 and 2 on this paper and questions 5 and 6 on the Foundation Tier paper are common. These questions are identical and are targeted at standard demand.

Questions are set at three levels of demand for this paper:

- **Standard demand** questions are designed to broadly target grades 4–5.
- **Standard/high demand** questions are designed to broadly target grades 6–7.
- **High demand** questions are designed to broadly target grades 8–9.

A student's final grade is based on their attainment across all six papers.

© 2024 AQA and its licensors. All rights reserved.

Summary of overall performance

On the whole, students found this paper to be accessible, with the vast majority attempting to answer all questions.

Students were provided with a Physics Equations Sheet that included all equations needed. This considerably eased the demand of some of the calculation questions. Two of the calculation questions were more challenging than in previous years. Questions **03.4** and **05.5** had fewer students than expected gaining full marks. Both these questions tested students' problem-solving skills and were not just a case of using the correct equation.

Some questions highlighted skills gaps. Question **04.3** required students to determine the half-life from a graph. This skill has been tested numerous times, and it is a skill that the majority of Higher tier students should have practiced several times. Well over a quarter of students demonstrated that they did not understand how to do this.

Question **02.1** asked students to describe how three measurements could be made. This was not very well answered. The majority of students could give some of the equipment they would need to take the measurements. With all practical method questions students should always state the equipment and describe what they are measuring and with which piece of equipment. Only about 10% of students described a method that would lead to a valid outcome.

© 2024 AQA and its licensors. All rights reserved.

Question 1 (Standard demand)

01.1 75% of students gained at least one mark on this question. 50% of students gained one mark, mostly for either stating that a thermal store of energy increased or that a kinetic store of energy increased. 25% of students gained 2 marks for making both statements and/or identifying that a chemical store of energy was decreasing.

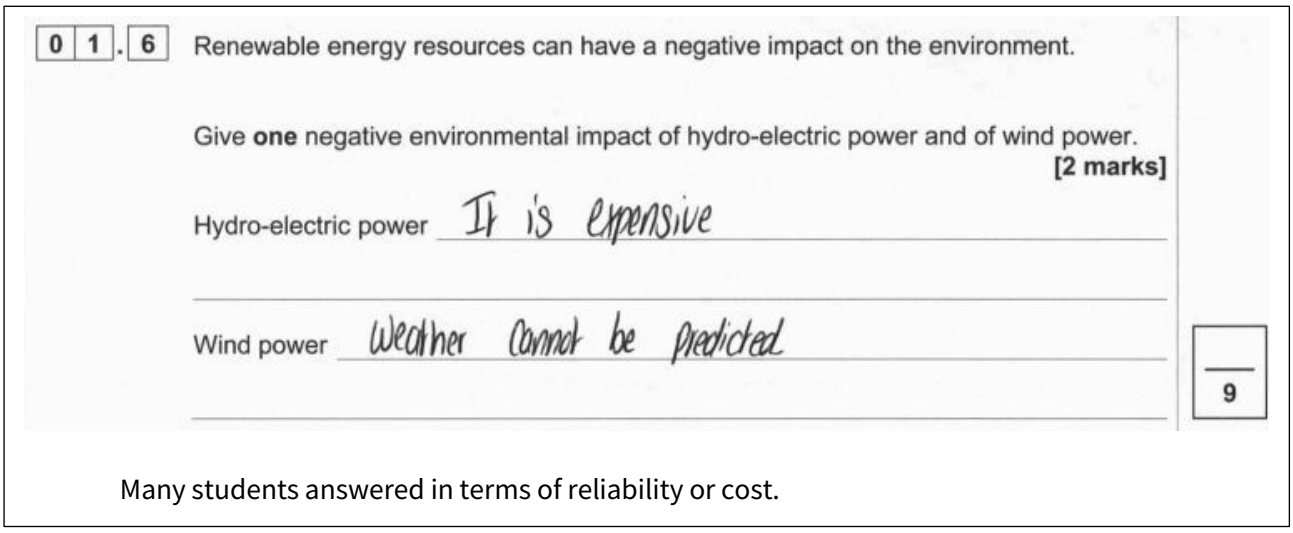
01.2 This question was reasonably well answered, with approximately 50% of students answering correctly.

01.3 This question was very well answered with 95% of students answering correctly by stating that the cars are powered by a battery or by electricity.

01.4 80% of students could correctly analyse the bar chart to conclude that the amount of fossil fuel that is burnt to generate electricity each year has decreased.

01.5 Only a very small number of students gained 2 marks on this question. 40% of students gained one mark for identifying that it is expensive, but the vast majority of those students did not state that *many* generators or resources are required.

01.6 Many students did not give a negative impact on the environment in their answer and described both types of resource as being unreliable. 40% of students were able to gain 1 mark mostly for giving a negative impact on the environment for wind power. Many students suggested that hydro-electric power has a damaging impact on habitats in the sea. 20% of students were able to give a negative impact on the environment for both resources.



0 1 . 6 Renewable energy resources can have a negative impact on the environment.

Give **one** negative environmental impact of hydro-electric power and of wind power.

[2 marks]

Hydro-electric power It is expensive

Wind power Weather cannot be predicted

9

Many students answered in terms of reliability or cost.

© 2024 AQA and its licensors. All rights reserved.

Question 2 (Standard demand)

02.1 This standard demand calculation was well answered with over 80% of students gaining full marks. Nearly all students that did a correct substitution were able to rearrange correctly and calculate the final answer.

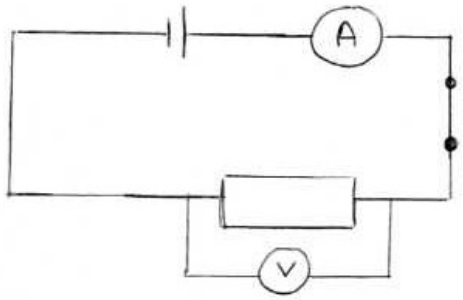
02.2 Students found this question quite demanding. Over 20% of students did not attempt the question. 40% of students were able to write something creditworthy. 85% of students wrote a creditworthy response. Half of students that gained marks wrote Level 1 responses, the most common Level 1 response just suggested measuring temperature with a thermometer. The 40% of students that wrote Level 2 or 3 answers went on to describe measuring the energy transferred with either a joulemeter or other method and/or measuring mass using a top pan balance.

02.3 Over 95% of students were able to gain at least 1 mark on this question. The majority of students who gained one mark identified that the amount of wasted energy is less. 45% of students gained a second mark for also identifying that the temperature increase of the aluminium block is greater.

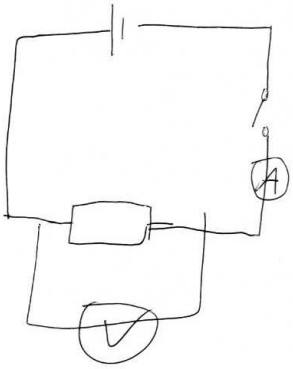
© 2024 AQA and its licensors. All rights reserved.

Question 3 (Standard and standard/high demand)

03.1 Nearly 90% of students gained at least 1 mark on this question. 40% gained all three marks for using all the correct circuit symbols and drawing an ammeter in series and voltmeter in parallel with the resistor. 25% of students gained 2 marks due to having one error, which most commonly was having an incorrect circuit symbol or having the voltmeter in series.



It is expected that students draw circuit diagram accurately. This an excellent example, scoring all 3 marks.



There should be no lines through the symbols, this example shows incorrect circuit symbols and there is a significant gap in the circuit next to the cell.

03.2 This calculation was reasonably well answered. Over 70% of students gained at least 3 marks. Nearly all students that did a correct substitution were able to rearrange correctly and calculate the final answer. 45% of students did a correct conversion of the current to amps and did the calculation correctly so gained 4 marks.

03.3 75% of students draw a straight line through the origin in both 1st and 3rd quadrant so gained the mark. A number of students only drew the line in the 1st quadrant, so did not gain the mark. Some students drew the IV curve for a lamp.

03.4 There were two different valid calculations students could do to determine which resistors in figure 3 were suitable to be used. The most common method was to determine the power when a current of 0.012A was in a resistor. 10% of students gained a mark for converting the resistance in ohms but could not get any further. 45% of students completed a valid calculation so gained 3 marks. Only 15% went on to draw the correct conclusion based on their calculation and were awarded 4 marks.

© 2024 AQA and its licensors. All rights reserved.

Question 4 (Standard/high and high demand)

04.1 Some students misinterpreted the question and did not describe an alpha particle, beta particle, and gamma ray, but described their properties. 50% of students were able to correctly describe one of them, but only 20% correctly described all three.

04.2 40% of students gained both marks. The majority of the 15% of students who only gained one mark, made a mistake on the bottom row.

04.3 60% of students gained a mark on this question. 10% of students correctly drew the line from 11, but either the line was not drawn accurately enough, or they then mis-read the scale on the *x*-axis. 50% of students gained both marks.

04.4 80% of students were able to get started on this question by correctly reading the activity as 6.0 (kBq) but could not get any further. Many of those that failed to gain any further calculation marks worked out what 6.0 was as a percentage of 22. 40% of students gained the 3 calculation marks. The mark for the correct significant figures was still awarded if an error had been made in the calculation.

04.5 Students found this high demand question challenging. 30% of students did gain a mark and most of those answered that the sample being very near to the cancer cells decreases the risk to healthy cells. Less than 5% of students gained two marks for also saying that beta only has a short range. Very few students stated that it increased the chance of killing the cancer cells.

04.6 20% of students gained the mark on this high demand question. There were approximately equal numbers of answers that stated the risk of removing the sample is greater than the risk of leaving the sample in the patient and answers that stated the activity will reduce to a safe level in a short time. A common incorrect answer was that it would protect the patient if the cancer returned, most students did not appreciate the short half-life of the gold-198.

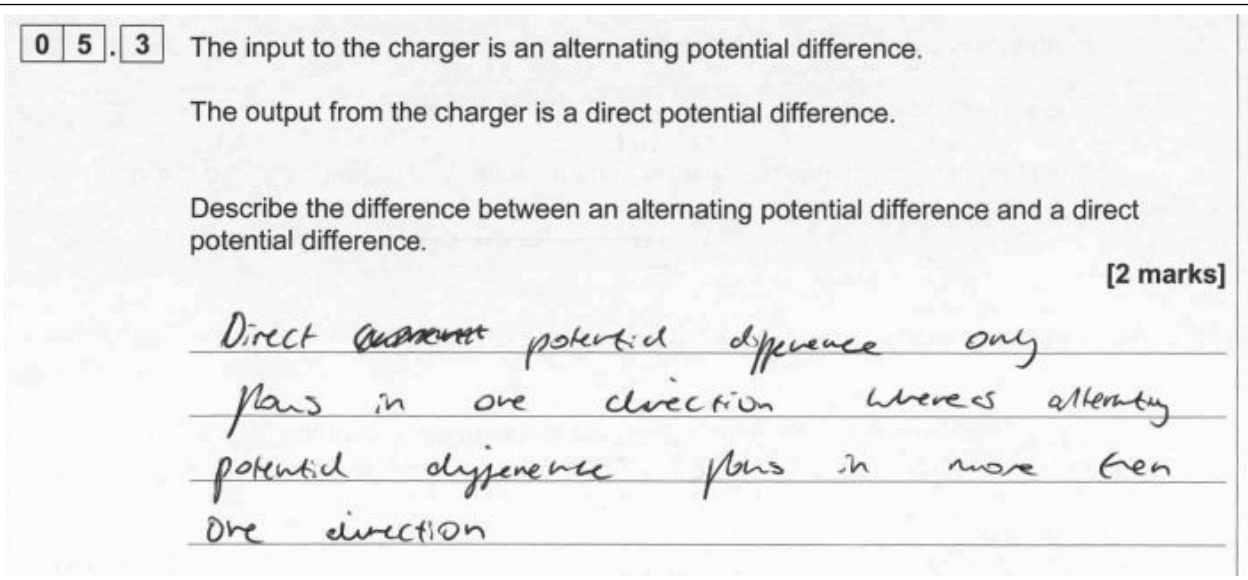
© 2024 AQA and its licensors. All rights reserved.

Question 5 (Standard/high and high demand)

05.1 55% of students gave one correct value and 20% gave both correct. Where, only one was correct, the frequency was more commonly known.

05.2 75% of students correctly named both wires and the correct colour of insulation. Where only one mark was awarded, it was most common to see the live wire and colour correct, but the name of the second wire was incorrect. Incorrect responses often gave the colour of the earth wire.

05.3 43% gained 1 mark. The vast majority of these were awarded the mark for direct (potential difference) is always in the same direction. Under 10% of students also gained the mark for the alternating potential difference. For alternating potential difference, the idea that it is continuously changing direction must be explicit.



0 5 . 3 The input to the charger is an alternating potential difference.

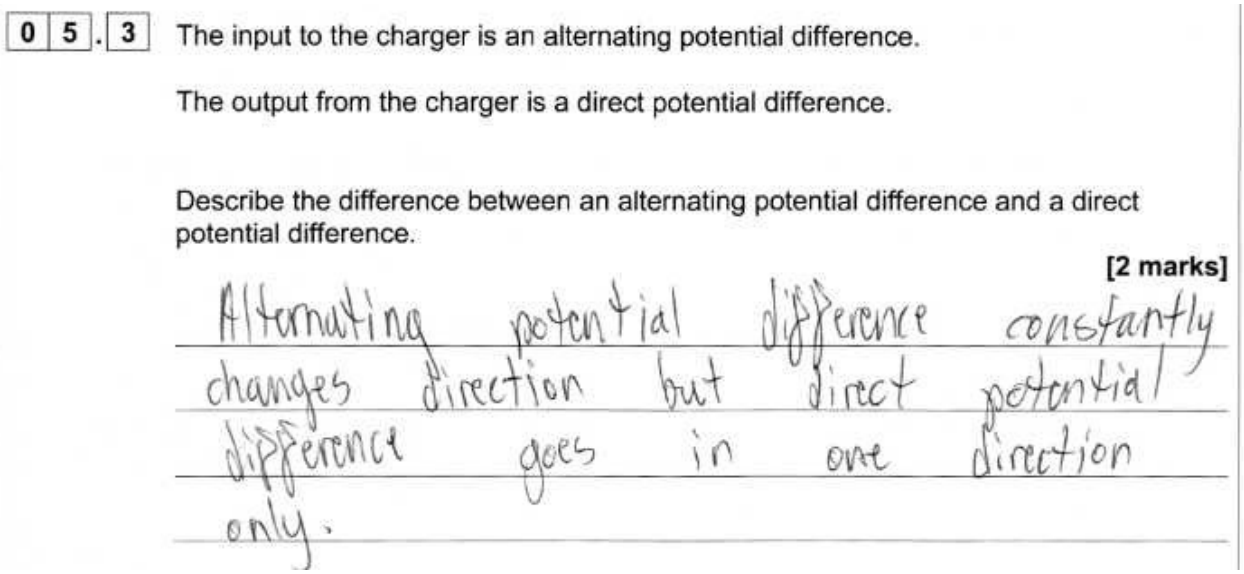
The output from the charger is a direct potential difference.

Describe the difference between an alternating potential difference and a direct potential difference.

[2 marks]

Direct potential difference only
flows in one direction whereas alternating
potential difference flows in more than
one direction

This answer gains 1 mark. For alternating potential difference, 'more than one direction' is insufficient.



0 5 . 3 The input to the charger is an alternating potential difference.

The output from the charger is a direct potential difference.

Describe the difference between an alternating potential difference and a direct potential difference.

[2 marks]

Alternating potential difference constantly
changes direction but direct potential
difference goes in one direction
only.

This answer gains 2 marks; the idea that an alternating potential difference is continuously changing direction is explicit, along with a correct description of direct potential difference.

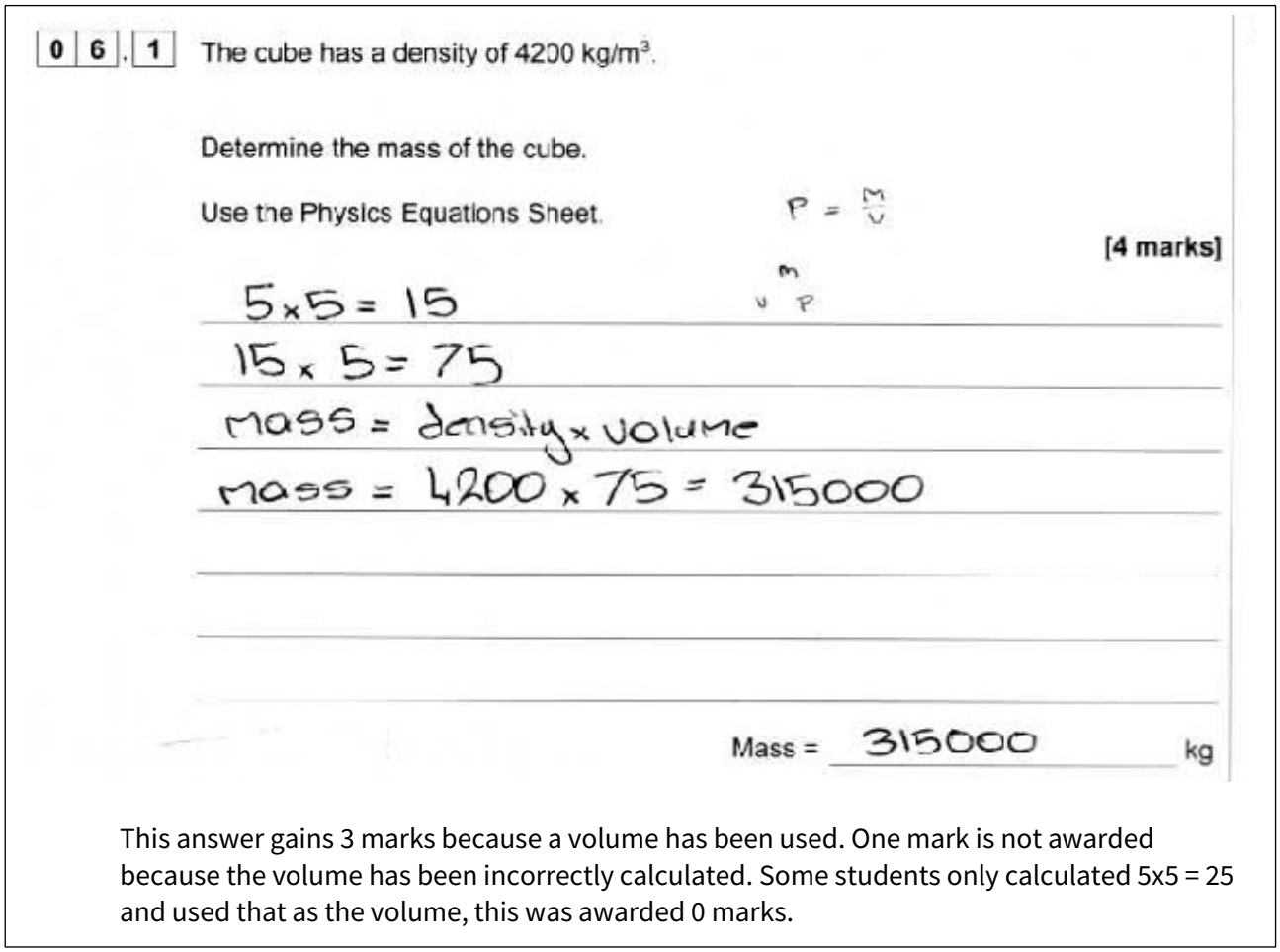
© 2024 AQA and its licensors. All rights reserved.

05.4 60% of students correctly identified that the laptop is using energy as it is still being used. Only a very small number correctly explained that this meant that the rate at which the energy is stored in the battery decreases.

05.5 This multi-step calculation proved to be more challenging than in previous years. Only approximately 15% of students gained full marks. 50% of students calculated the power of the laptop but could not get any further. Some students calculated the time in seconds correctly but could not convert the answer to hours. Students are reminded that they should show their working for multi-step calculations.

Question 6 (High demand)

06.1 Students that could not calculate the volume of the cube struggled to gain marks. When using the density equation students had to substitute a volume, or no marks are awarded. Some students used an area and not a volume. 80% of students gained a mark on this question but only 55% gained all 4 marks.



0 6 . 1 The cube has a density of 4200 kg/m^3.

Determine the mass of the cube.

Use the Physics Equations Sheet. $P = \frac{m}{V}$

[4 marks]

$\frac{m}{V}$ P

5 x 5 = 15

15 x 5 = 75

mass = density x volume

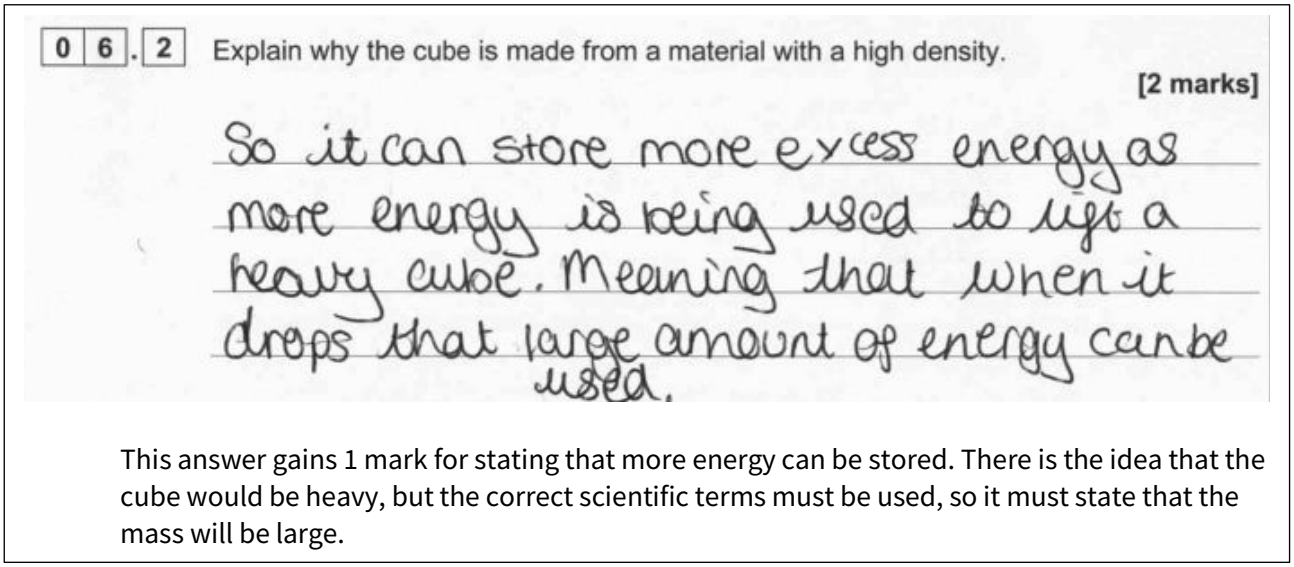
mass = 4200 x 75 = 315000

Mass = 315000 kg

This answer gains 3 marks because a volume has been used. One mark is not awarded because the volume has been incorrectly calculated. Some students only calculated 5x5 = 25 and used that as the volume, this was awarded 0 marks.

© 2024 AQA and its licensors. All rights reserved.

06.2 26% of students gained a mark for identifying the either this meant the cube had a greater mass or that it can store more energy. Less than 5% of students made both statements.



This answer gains 1 mark for stating that more energy can be stored. There is the idea that the cube would be heavy, but the correct scientific terms must be used, so it must state that the mass will be large.

06.3 This high demand question performed as expected with only a small percentage of students gaining any marks. For marks to be awarded answers had to refer to the overall efficiency of the entire system, just quoting the efficiency equation from the equations sheet was insufficient.

06.4 This high demand question performed as expected with only a small percentage of students gaining any marks. The most common incorrect answer only stated that you should lift it faster.

© 2024 AQA and its licensors. All rights reserved.

Contact us

Our friendly team will be happy to support you between 8am and 5pm, Monday to Friday.

Tel: 01483 477756
Email: gcsescience@aqa.org.uk

aqa.org.uk

© 2024 AQA and its licensors. All rights reserved.