



GCSE

PHYSICS

8463/2F Paper 2 (Foundation)

Report on the Examination

8463

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General

Questions 8 and 9 are common with questions 1 and 2 in the GCSE Physics Paper 2 Higher tier.

Levels of demand

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

- **low demand** questions are designed to broadly target grades 1–3.
- **standard demand** questions are designed to broadly target grades 4–5.

A student's final grade, however, is based on their attainment across the qualification as a whole, not just on questions that may have been targeted at the level at which they are working.

Question 1 (Low demand)

- 01.1 Most of the students were able to identify correctly which pairs of magnets would attract and which would repel.
- 01.2 Most of the students scored at least one mark with just over half of the students scoring both marks.
- 01.3 This was not well known with only just over half of the students choosing iron.
- 01.4 Just over half of the students knew that when the circuit was complete there would be a current in the coil
- 01.5 Approximately three quarters of the students realised that the magnetic field would be stronger.
- 01.6 Around three quarters of the students realised that the magnetic field would be weaker.

Question 2 (Low demand)

- 02.1 Almost all of the students correctly identified 'gravitational force'.
- 02.2 About 70% of the students realised that 'air resistance' increased as the hailstones accelerated.
- 02.3 About 60% of the students gave the correct answer. The incorrect answers were equally split between the two distractors.
- 02.4 About half of the students made an attempt at extrapolating the line with a subsequent correct value read from the graph. Incorrect answers usually involved students trying to work out a mathematical pattern or simply writing a number down.
- 02.5 Approximately three quarters of the students realised that it was due to a greater weight.

- 02.6 Just over half of the students knew how to correctly calculate the resultant force.
- 02.7 Surprisingly, since the largest force arrow is shown pointing upwards, just under half of the students gave the correct answer of 'up'.

Question 3 (Low demand)

- 03.1 About three quarters of the students knew that the Sun is a star. Common incorrect answers were usually a simple description of its shape or its high temperature.
- 03.2 Nearly all the students knew that our solar system is called the Milky Way.
- 03.3 Whilst many of the students knew that a moon orbits a planet, less than 20% were able to correctly give the term 'natural satellite'. The weakest answers simply described the moon in terms of a 'round object' or a 'rock/planet'.
- 03.4 Less than half of the students were able to give two correct statements based on the data in Table 2. Many of the students failed to score a mark due to making vague or incorrect statements not related to the given data. The radius of Europa was often misread with Europa stated as being smaller than the dwarf planet.
- 03.5 Almost none of the students scored 2 marks, with only about a quarter scoring 1 mark. A significant number of students did not attempt the question. Most of the answers scoring 1 mark were for a suitable difference, usually given in terms of time taken to orbit or distance from the Earth.
- 03.6 The most common correct answers were given in terms of the cost of space travel or the training / skills required.

Question 4 (Low demand)

- 04.1 The correct answer was chosen by approximately 65% of the students.
- 04.2 The correct answer was chosen by approximately 70% of the students.
- 04.3 Approximately 80% of the answers were correct. Most errors occurred due to misreading the balance or dividing by a number other than five.
- 04.4 This was well answered. A significant number of the students gained both marks by correctly using an incorrect answer to part 04.3.
- 04.5 Just over 60% of the students were able to calculate the extension of the spring correctly.
- 04.6 Students who did not choose the correct value in part 04.5 were still able to score both marks for this part question. However, many of the students used values different to their choice in part 04.5 or tried a wrong conversion and so scored zero.

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- 04.7 This was generally well answered although some statements were in terms of the movement of the spring, rather than it reverting back to its original length / shape.

Question 5 (Low and standard demand)

- 05.1 Very few of the students seemed to know that all electromagnetic waves travel at the same speed in a vacuum.
- 05.2 The order of the waves in the electromagnetic spectrum was not well known with only about 40% of the students scoring both marks.
- 05.3 The majority of the students demonstrated an understanding of 'range'. About 10% of students did not attempt the question.
- 05.4 Very few of the students related the information in Table 4 and Figure 10 to the relative risk of harm to people. Few of the students scored more than 1 mark with about 13% of the students not attempting the question. Most of the students that scored 1 mark did so for giving a general trend or stating that UV can cause skin cancer.
- 05.5 Many of the students tried to give a more complex answer than required, which were commonly incorrect. The most common correct answers involved being able to see or the idea that if light did not get through it would be dark all the time.
- 05.6 Nearly three quarters of the students scored at least one mark, often for completing the second blank space correctly.

Question 6 (Low demand)

- 06.1 Very few of the students could give a correct approximate depth of the Earth's atmosphere.
- 06.2 Most of the students chose the correct answer although 'Liquid' was a common incorrect choice.
- 06.3 Approximately three quarters of the students were able to read the correct value from the graph.
- 06.4 Few of the students seemed to understand what is meant by 'sea level'. As a consequence, they were not able to read a correct value from the graph. Only about 25% of students scored the mark.
- 06.5 Most of the students scored at least 1 mark, with about a quarter scoring both marks.
- 06.6 The calculation was well done with just over three quarters of the students scoring both marks. Where an error was made, it was usually with the 2000 m² with some students squaring the 2000 rather than realising it is part of the unit.

Question 7 (Low and standard demand)

- 07.1 Most of the students scored at least 1 mark with the majority scoring both.
- 07.2 The answers were split 50/50 between parallel and perpendicular.
- 07.3 About three quarters of the students chose the correct answer.
- 07.4 Very few of the students appeared to see the link between part 07.3 and 07.4. Those choosing the correct answer in 07.3 often went on to use the value 8 rather than 8000 and so scored zero. The students scoring both marks often did so for choosing the wrong answer '8' in part 07.3 but then using it in this calculation.
- 07.5 About 30% of the students failed to score 3 marks as they were unable to give the correct unit of wavelength.
- 07.6 Almost all the students were able to use the equations sheet to give the correct equation. A few students only wrote the three symbols inside a triangle - this is not an equation and so scored zero.
- 07.7 A significant minority of the students were unable to rearrange the equation correctly and thus ended up with an incorrect answer. Over half of the students scored all 3 marks.
- 07.8 Very few of the answers given linked the three marking points together in a logical, well written sequence. The idea that the sound from speaker B would take more time to reach the technician was often omitted. Approximately 15% of the students did not attempt the question.

Question 8 (Standard demand)

- 08.1 Many of the students were able to give one factor but only about one quarter went on to score both marks. A significant number of the students gave vague answers such as 'weather' and so scored zero.
- 08.2 Almost all the students were able to use the equations sheet to give the correct equation. 4% of the students did not attempt to give an equation
- 08.3 A significant number of the students multiplied the two values together and so scored zero. Approximately 10% of the students did not attempt the question.
- 08.4 Approximately 50% of the students scored 2 or 3 marks. A common error was to misunderstand what a calculated value of 12100 was. Some of the students thought this to be the final velocity whilst others went on to work out 12100 squared as the final velocity. Those scoring zero often failed to show any working out and so could not be given any of the 'method' marks.
- 08.5 Despite the equation sheet being given, 5% of the students did not give an equation.
- 08.6 The vast majority of the students did not convert the distance to metres and so scored only 2 marks.

Question 9 (Standard demand)

- 09.1 Many of the students did not appear to know which experiment to describe. A significant number described a reflection experiment using a mirror whilst others described how the data would be displayed rather than how it would be obtained. Approximately 30% of the students did not attempt the question.
- 09.2 Many students failed to label the axes and / or draw a line of best fit. Students should also be aware that lines of best fit are not always straight.
- 09.3 Many of the students did not appear to have a protractor or chose not to use one. A less common error was to show the incident ray being refracted by the mirror. The normal line was often not drawn.
- 09.4 Most of the students that scored 1 mark did so for realising that Method A would give more accurate results. However, few of the students were able to link ideas to give clear explanations. The more common correct responses were in terms of the protractor not having to be moved and the laser producing a thinner ray of light. The idea of the mirror not having to be moved or repositioned was rarely seen.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.