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Realising potential

insights

GCSE PHYSICS

Insight report:

2019 results at a glance

September 2019

2019

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How to use this report

This report provides a snapshot of this summer's results. It contains information on grade boundaries and performance by paper. This report is part of our full results insight series. For extra information on results:

- Join your Head of Curriculum for a video breakdown.
- Access our free Enhanced Results Analysis tool. We've created two-minute tutorials to show you how.
- Navigate to e-AQA to download the full report on the exam for a detailed breakdown.
- Book on to one of our Live lessons webinars. The Head of Curriculum for your subject will take you through this year's results and answer your questions.
- Book on to a Feedback event. See examples from real scripts from the summer to highlight common areas where students did well and where there's room for improvement.

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Qualification summary

This was the second year of the reformed specification which is assessed by two terminal exams. Each paper has 100 marks and students have 105 minutes to complete them. There are three Assessment Objectives. Approximately 40% of the marks are for demonstrating knowledge and understanding of: scientific ideas, scientific techniques and procedures (AO1), another 40% on application of knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures (AO2) and 20% for analysing information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures (AO3).

Students appear to have been well prepared. Students made a good attempt at all the questions but the imprecise use of scientific language and a lack of attention to the question asked caused issues in some responses.
Some students' writing was extremely difficult to read, which made marking their responses challenging, particularly in the longer questions.

In the low demand calculation questions, the equation is given to students in the form they will need to use it. It was pleasing to find that a large percentage of students were able to substitute the given values correctly into the given equation and, in most cases, perform the calculation correctly. However in the standard demand calculations most students were unable to recall the required equation despite being given the quantities. There is still a habit of simply writing the quantities out in the alphabetical order given in the question.

Practical based questions were generally well attempted and students, who could recall carrying out the Required Practical activities, could understand how the intended outcome would be achieved and the purpose of those activities would have had a material advantage over those who hadn't.

Levels of demand

Questions are set at four levels of demand for this specification with different levels of demand within each of the tiers:

Foundation tier

- Low demand questions are targeted at students working at grades 1–3.
- Standard demand questions are targeted at students working at grades 4–5.

Higher tier

- Standard demand questions are targeted at students working at grades 4–5.
- Standard/high demand questions are targeted at students working at grades 6–7.
- High demand questions are targeted at students working at grades 8–9.

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

Enhanced results analysis

Conduct your own analysis using data relevant to you. Watch short tutorials on using Enhanced Results Analysis (ERA) for school, subject, group or student performance; or log straight in through aqa.org.uk/log-in

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Grade boundaries

Subject or paper	Max mark	Summer 2019 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Physics - 8463 (Foundation)	200	-	-	-	-	129	111	80	50	20

Subject or paper	Max mark	Summer 2019 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Physics - 8463 (Higher)	200	143	125	108	89	70	51	41	-	-

How to interpret grade boundaries

Grade boundaries are set using a mix of statistics and expert judgement

Our research team uses a range of statistics to make predictions that suggest the most appropriate grade boundaries. The statistical evidence considers the prior attainment of the given cohort as well as the distribution of marks. Senior examiners then review a script sample to confirm the statistically recommended marks are sensible for the grade.

Boundary setting is overseen by Ofqual.

Please note: Grade boundaries are set during the awarding process, as a result of the performance of the cohort taking each exam on the papers that were set in a particular year. Grade boundaries can go up or down, depending upon the characteristics of the cohort and their response to the demand of the papers in that year.

Watch our two-minute team stories to find out more about how we set grade boundaries and ensure fairness. Visit aqa.org.uk/team-stories

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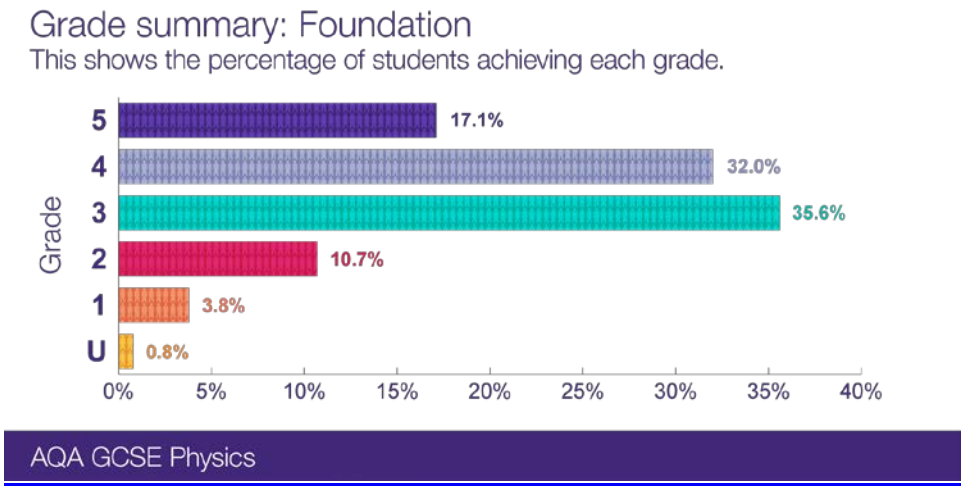
Performance overview

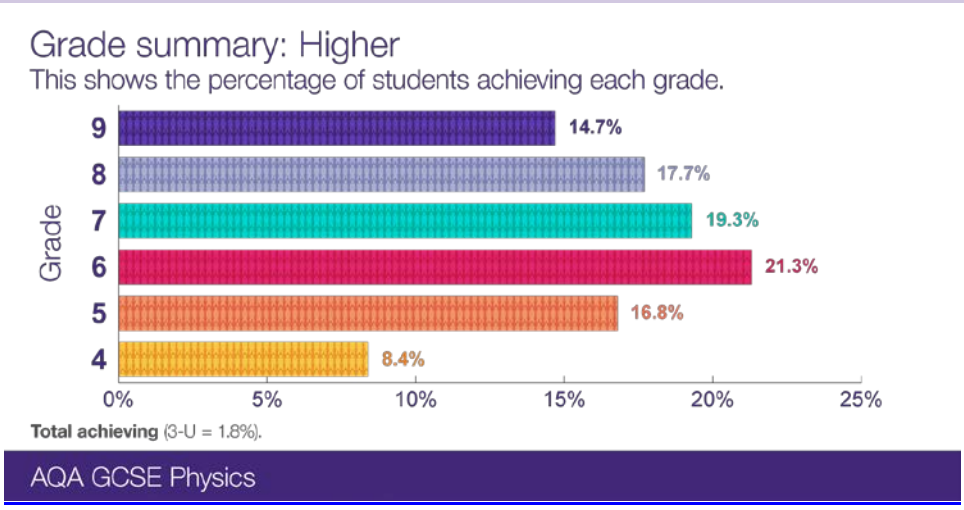
Grade summaries

The figures below represent the performance of those students who entered each tier in physics in 2019; the performance of those students gaining a grade 4 or grade 5 on either tier is equivalent, though the number of marks they will have needed to gain to get each grade will be different, as will their experience of the paper they sat.

Grade summary



Grade summary



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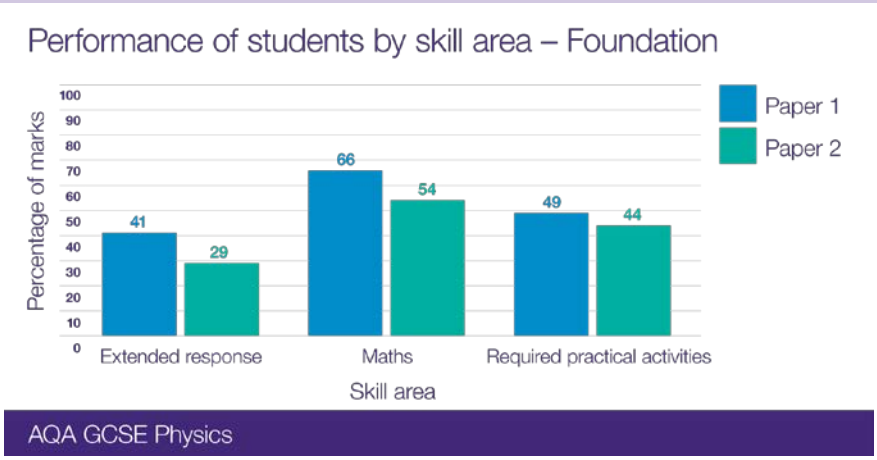
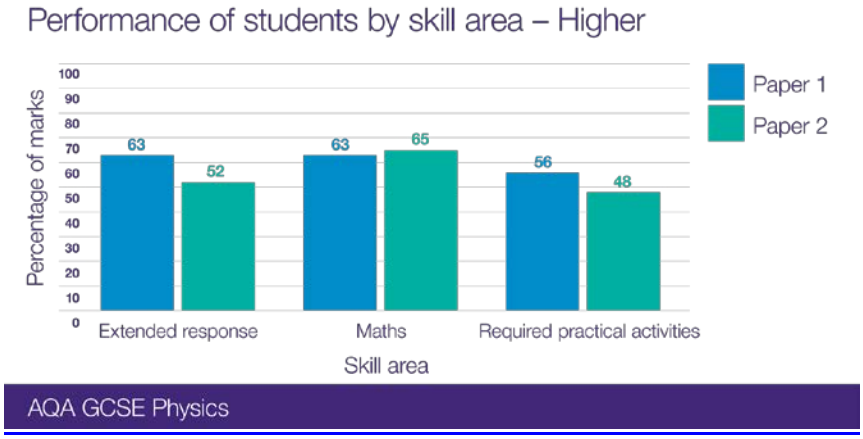
Performance by skill area



Performance of students by skill area – Foundation

On each paper, a number of marks are allocated to test the following skill areas: extended response, maths and practical skills.

This graphic shows the mean percentage of marks achieved for each skill area.



Performance of students by skill area – Higher

On each paper, a number of marks are allocated to test the following skill areas: extended response, maths and practical skills.

This graphic shows the mean percentage of marks achieved for each skill area.

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Paper 1 insights

This is a snapshot. Learn more about every question from the summer 2019 series in our reports on the exam. Visit aqa.org.uk/log-in and follow:

e-AQA > Secure Key Materials > GCSE > Science/PE > Physics (new specification) > Reports on the exam

Highlights from summer 2019

Foundation

Students performed well with calculation questions at grades 4–5; and in some cases demonstrated good graphical analysis skills. Knowledge and understanding of energy resources and electric circuits was reasonably strong. Students do not need to recall equations in the same order that terms are given in the question – any correct rearrangement will be credited. Many attempted to give their equation in alphabetical order – matching the question – and made mistakes doing so.

Themes where students did best	Themes where students did less well
• **Equations and mathematical skills:** Students were reasonably secure with recall of equations and many were able to rearrange equations correctly. Students showed confidence in reading and using data from some of the graphs. • **Knowledge and understanding:** Students performed well on questions that assessed energy resources, and did fairly well on questions that assessed basic knowledge of electronic circuits.	• **Equations and mathematical skills:** Some students attempted to use significant figures, truncated values or attempted to convert units when they didn't need to. Sense-checking answers might help students see that their final value is not realistic, eg a person jumping five metres vertically. Students found graphs that used time of day difficult to interpret. A question that asked for comparisons of data from a graph was typically answered with isolated descriptions rather than similarities or differences. Students do not need to recall equations in the order that terms are given in the question – terms are given alphabetically. Any correct re-arrangement of the variables will score credit for recall. • **Practical based questions:** Students with experience of the Required Practical Activities had a material advantage over those without this experience. Many

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	students described methods for different Required Practical Activities than those requested in the question, meaning they were unable to gain any credit. Students often gave precautions instead of identifying risks. • **Use of information from the questions:** When asked to suggest reasons why particular data was collected, many students simply rephrased the stem to state that the reason was the data was needed, rather than answering the question

Higher

Themes where students did best	Themes where students did less well
• **Equations and mathematical skills:** Students were able to access marks for calculation questions and many were able to access full marks on the higher tariff calculations by identifying steps such as converting units, even when not prompted. • **Practical based questions:** Students were able to use their experience of the Required Practical Activities to give good methods. Students also showed good understanding of the practical investigation of thermal conductivity.	• **Equations and mathematical skills:** Questions assessing equation recall give the terms in alphabetical order. Students do not need to write their equation in this particular order – many attempted to do so and made mistakes with the rearrangement. • **Knowledge and understanding:** Unclear understanding of vocabulary caused issues – students using precision when they should use resolution and stated that higher resolution was worse than lower resolution. • **Command words:** Students should be clear that they need to give similarities and differences when asked to make comparisons.

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Paper 2 insights

Foundation

Themes where students did best	Themes where students did less well
• **Equations and mathematical skills:** Students were confident producing velocity-time graphs from given data and generally did well manipulating data in calculations. • **Knowledge and understanding:** Students showed a fairly good grasp of refraction, red-shift and the Big Bang. Knowledge of magnets and electromagnets was also generally good.	• **Practical based questions:** Students didn't do well at measuring angles using a protractor. Methods given for an investigation into emissivity of infrared radiation and for an investigation into wave speed on a string were also fairly weak. • **Knowledge and understanding:** Understanding of lenses and features of ray diagrams was poor with most accessing only the calculation marks on this topic. Students gave poor answers to questions assessing factors that affect stopping distance. Many did not use ideas from the specification when answering questions on this topic.

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Higher

Themes where students did best	Themes where students did less well
• **Equations and mathematical skills:** Students did well with manipulating data from graphs. Many also scored full marks for a multi-step calculation involving stretching springs, but did less well on a question that involved significant figures. • **Knowledge and understanding:** Students struggled with a description of red-shift, but were able to offer good descriptions of the observations for a given example of red-shift. • **Practical based questions:** Many students recognised when variables had not been adequately controlled, making a method invalid for the investigation. Students were able to suggest that data may make a given conclusion invalid, but did not give reasons why.	• **Equations and mathematical skills:** Descriptions of graphs were too simplistic, not accounting for changes in the shape of the curve. Many students struggled to link the shape of a graph with what was happening physically. Conversion of units with prefixes such as tera- and milli- were not well done. • **Knowledge and understanding:** The term precision was confused with accuracy or resolution. Students struggled with explanations of factors affecting stopping distances, mainly because they did not use ideas from the specification. Electromagnetism was not well understood, with students missing detail in explanations of why two induced like magnets would repel. Some students confused the life cycle of stars for the Big Bang. • **Use of information from the questions:** Students sometimes did not carry out calculations with the values given – using a commonly remembered value of 50 Hz when the question stated the frequency was 55 Hz.

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T: 01483 477756
E: gcsescience@aqa.org.uk

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Results insights are available for all our GCSE specifications:

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