AQA
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GCSE
PHYSICS

Insight report: 2018 results at a glance

Published: September 2018

Responsible for multiple sciences?

Results insights are available for all our GCSE specifications:

- Biology
- Chemistry
- Combined Science: Synergy
- Combined Science: Trilogy

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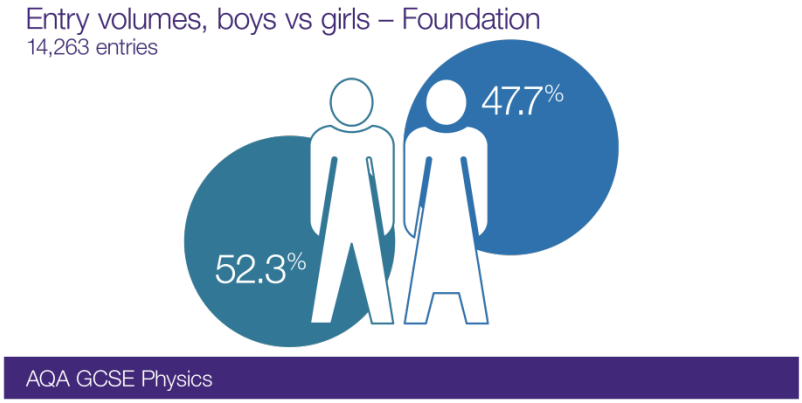
Foundation tier analysis

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



Entry volumes, boys vs girls

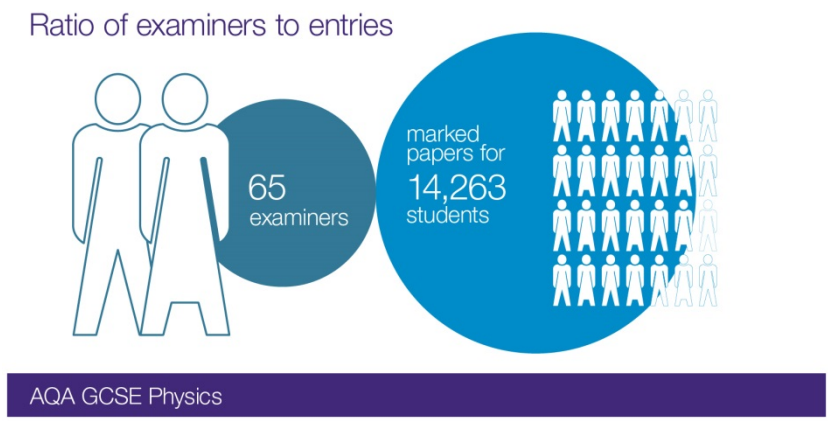
7,458 boys
6,805 girls.

Grade summary

Watch tutorials on using ERA for results analysis, or log straight in via e-AQA.

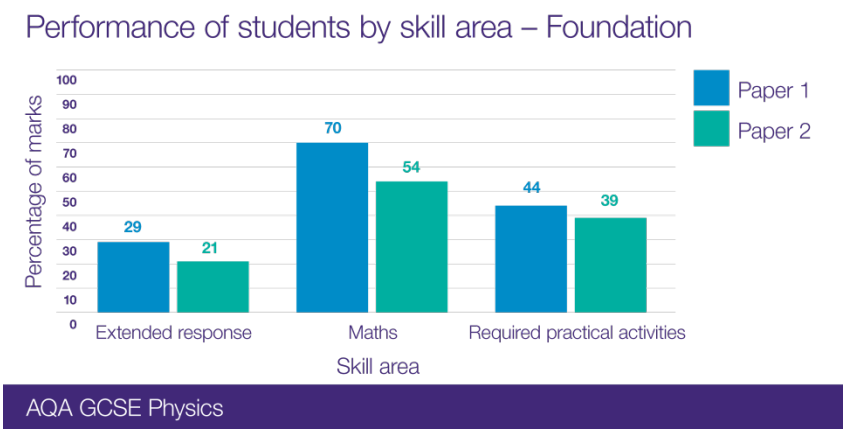
Foundation tier analysis cont.

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



Ratio of examiners to entries

65 examiners marked papers for 14,263 entries.



Performance of students by skill area – Foundation

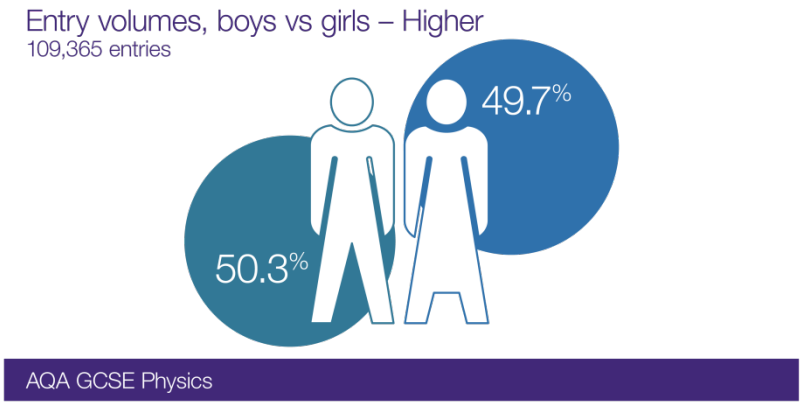
On each paper, a number of marks are allocated to test the following skill areas: extended response, maths, and practical skills.

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

Watch tutorials on using ERA for results analysis, or log straight in via e-AQA.

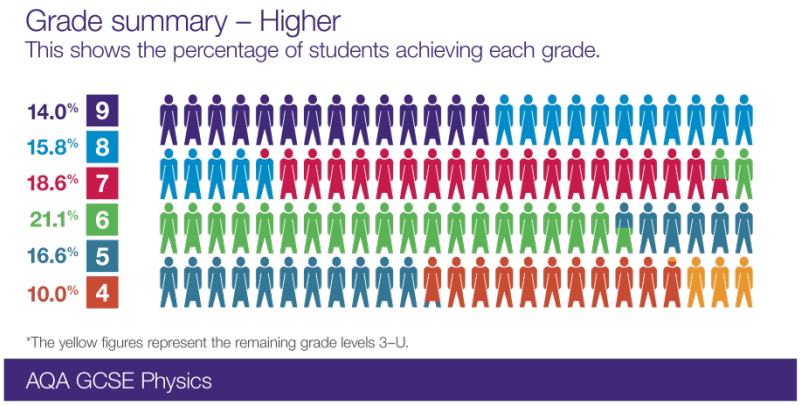
Higher tier analysis

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



Entry volumes, boys vs girls

55,001 boys
54,364 girls.



Grade summary

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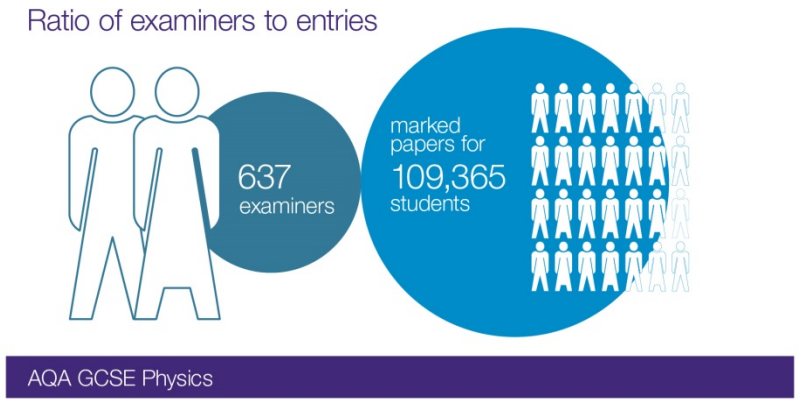
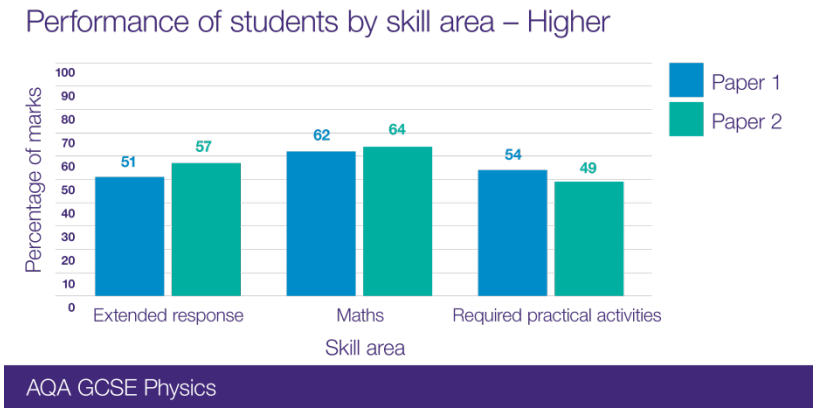
Higher tier analysis cont.

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



Ratio of examiners to entries

637 examiners marked papers for 109,365 entries.



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.

Watch tutorials on using ERA for results analysis, or log straight in via e-AQA.

Grade boundaries

Subject or paper	Max mark	Summer 2018 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Physics, 8463 (Higher)	200	135	119	103	85	68	51	34	-	-

Subject or paper	Max mark	Summer 2018 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Physics, 8463 (Foundation)	200	-	-	-	-	123	107	80	53	27

How to interpret grade boundaries

For 2018, Ofqual agreed that all exam boards should widen the allowed grade 3 boundary for the Higher tier of GCSEs Biology, Chemistry and Physics. This means that the distance between the allowed grade 3 and 4 is the same as the distance between 4 and 5. Ofqual acknowledged that with the structural changes like the removal of untiered controlled assessment – tiering decisions were more complex this year. This decision ensured that Higher tier students who would have been better suited to the Foundation tier were not disadvantaged. Ofqual have indicated this won't be repeated in future, so schools should consider their entry policy carefully for summer 2019. You can read more on Ofqual's blog.

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

Our Centre for Education Research and Practice (CERP) 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. To find more grade boundaries and learn how they are set, visit aqa.org.uk/exams-administration/results-days/grade-boundaries-and-ums

Feedback on the exam courses use student responses to explore what happened in each exam series. Visit aqa.org.uk/physics-cpd

Qualification summary

The question papers and mark schemes were designed to allow students to gain marks for showing their knowledge, understanding and ability to apply these in each of the areas of science. Students should be prepared to expect unfamiliar contexts and information that assess the Assessment Objectives (AOs). Familiar contexts are those mentioned in the specification and assess recall, selection and communication of students' knowledge and understanding. Basic knowledge and understanding in familiar and in unfamiliar situations, including in the laboratory, are tested – so it's essential that students read and analyse the information provided, then read and understand the question before writing their response. Students should then check their answers, especially those that are descriptions or explanations. Many students use 'it' or 'they' without any clear indication of what they're referring to.

There were some common misinterpretations of questions either due to lack of familiarity with common scientific terms or misalignment with key words like 'describe' and 'explain'. Other problems in interpretation seemed to stem from not reading the question carefully enough to grasp what was being asked.

A few students used up a lot of space by repeating the question, which doesn't gain credit. A number of scripts were particularly difficult to read, either because of poor handwriting, use of pens with ink that wasn't black, or both.

Students were generally good at fitting their answers into the space available, but a number used additional pages either for working purposes (which needs to be crossed out) or to write a few words, which would have fitted on to the original paper. Students need to understand the list principle. If they give two answers (one right and one wrong) when only one is required then no mark can be awarded.

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.

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.

Paper 1, Foundation

This is a snapshot. Learn more about every question from the summer 2018 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 2018

Calculation questions

Foundation-tier students handled low demand calculations well. Many wrote down their working, so could score marks for correct substitution even if they made a mistake evaluating their answer. Some students tried to convert units where they didn't need to (eg kg into g). On the whole, students appeared to be better at maths in science than in previous years – this reflects positively on the efforts schools have gone to address the demands of new GCSEs.

Marks are not deducted for incorrect answers in calculations, so students should always attempt these. Performance on questions that ask for percentages (eg percentage change) was not always good.

Reading instructions carefully

Students should carefully read questions and the marks available. Some students overcomplicated the question, attempting difficult calculations for 1 mark questions where they were not needed. Some students only ticked one box when asked for two.

Equation recall questions

Note that while we present equation terms in alphabetical order, they don't need to be written in this way. So a question asking for an equation linking acceleration, force and mass does not need to be given as acceleration = force/mass. If students use symbols for equation recall, they need to make sure to use the correct symbols as given in the specification. Equation triangles will not be credited.

Checking working

Students should be encouraged to sense-check answers, eg on the question about electricity demands, the UK does not need $6x10^{13}$ power stations. On a question asking for the effect of a circuit change on the total resistance, some students ticked the box for 'resistance will decrease', but then contradicted themselves by giving a reason that the resistance increased.

Reports on the exam are written by senior examiners who see more responses than anyone else. Access full reports via aqa.org.uk/log-in

Paper 1, Higher

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Highlights from summer 2018

Adding value and not just quoting the question stem

Value needs to be added to information given in questions – if asked why repeat readings could provide more accurate data; an answer that it 'improves inaccuracy' is lacking. Similarly, when asked for details about a type of experimental error, 'human error' would not have been enough to score any marks.

Understand what the question is asking before answering

Answers should address questions as written – in one question, many wrote about the disadvantage of shale gas and not about advantages of nuclear power. Many knew that nuclear fission released energy, but were not able to give much detail about the process.

Calculation questions

Calculations were quite well done, but students made mistakes with conversion of units, eg from kW to W.

For the multistep calculation, many students didn't calculate a value for energy transferred. If they had made some attempt and gave a value from this attempt, they could have accessed some or all of the last three marks for a correct specific heat capacity calculation.

Required practical questions

Students should be careful to look at what a practical question is asking for – many did not make reference to changing the length of a piece of wire in an investigation into the relationship between resistance and length of wire, which limited the mark scheme levels they could access in the question.

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Paper 2, Foundation

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Highlights from summer 2018

Working with data and graphs

Working with anomalous results was a weakness for many students who did not remove the anomalous result before calculating a mean from a set of data. When asked to plot some data and draw a line-of-best-fit, many didn't attempt to plot the points. Lines do have to be reasonably accurate to be credited the mark, so it would help students if they brought a ruler to their exams. They can use a standard, reasonably dark graphite pencil for this type of task, as it is not possible to correct mistakes if the line is drawn with a pen.

Calculations

Students did well at calculations, but struggled when they needed to select the correct data for a calculation, for example a question about moments which included other information in the diagram.

Questions assessing learning from the required practicals

Students made good attempts at questions assessing the required practicals, but many responses lacked the precision of language to access higher levels. In an investigation into the strength of an electromagnet, many wrote that paperclips being picked up (used as a measure of strength) should be the same size to make it a 'fair test'. In another question asking for a method to determine a spring constant, many students gave a labelled diagram but wasted time describing the diagram rather than detailing the method needed. There was also some confusion amongst students around the distinction between a risk and a hazard.

Content and AO3

In terms of content, students had difficulties working with ray diagrams and were a little unclear of the distinction between wavelength and frequency.

There were some AO3 questions that were well answered. Many could identify from a diagram that water pressure increases with depth, which was encouraging.

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Paper 2, Higher

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Highlights from summer 2018

Knowledge of key concepts

The concept of a 'system' has clearly been well learnt as almost all students scored the mark for the correct definition. Similarly, 2/3 of students could identify Newton's Third Law.

Understanding velocity

There was some confusion around use of language with velocity, with some students thinking that a negative velocity indicated slowing down. When asked to explain why the velocity of a satellite changes as it orbits the Earth, few students indicated that velocity includes a direction component.

Questions assessing practical skills

There were good attempts at a question asking for a method to determine the spring constant of a spring. Many gave clear sketches of the set-up and had clearly experienced this practical before. Answers would have been improved with reference to changing the force applied. In another question, students wrote about a range of readings being needed to improve accuracy, rather than to identify anomalous results or reduce the effect of random error.

In a question based on the investigation of the reflection of light by a plane mirror (based on a required practical), students performed less well. 'Human error' was commonly seen as the type of error that would result in a range of values for the angle of reflection. When asked how to change the apparatus to investigate diffuse reflection, many simply wrote 'change the mirror' without any further detail. In a question asking for the reason for an anomalous result on a graph of secondary pd against secondary turns for a transformer, many wrote that the number of turns was not counted correctly, without indicating whether too many or too few had been counted.

Calculations and equation recall

Students should make sure to convert units where required – when asked for a spring constant in newtons per metre, many did not convert the extension from centimetres. Students should be familiar with common prefixes (eg micro) and what these look like in standard form. Equation recall was on the whole well done, with most students able to give the correct equation.

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Notes

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