

GCSE **BIOLOGY**

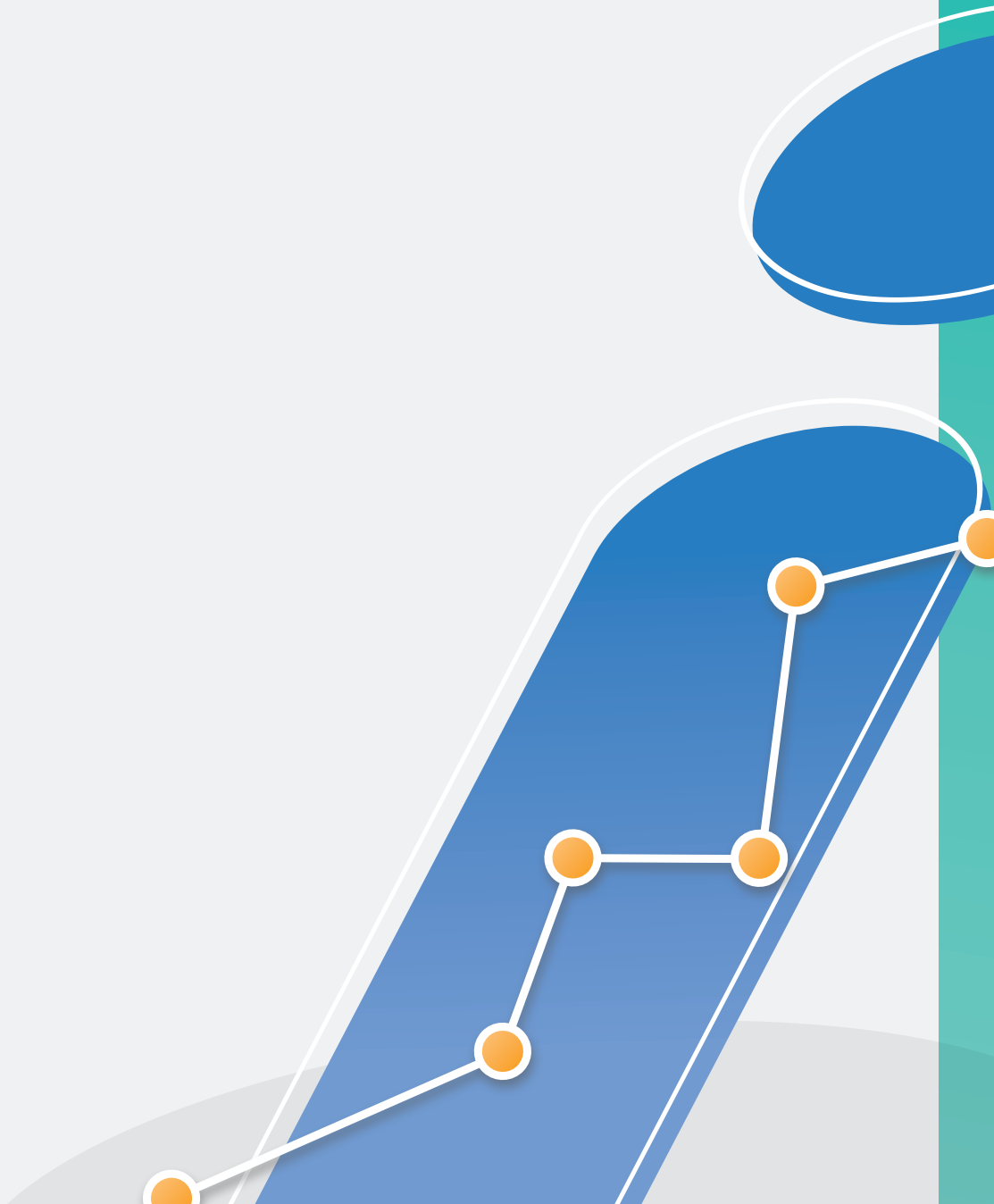
Insight report:
2019 results at a glance

September 2019

2019

aqa.org.uk

insights



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 in which to complete it. There are three Assessment Objectives (AO). 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 caused issues in some responses. Students often gave vague, broad answers that hinted at the right idea, but there was not sufficient scientific detail to enable the mark to be awarded.

Students should be encouraged to read back over longer written responses to check for errors and ensure that their meaning is clear. There were several incidences of students not reading and understanding the importance of both the question and the information given or in calculations, or not checking all of the instructions had been followed at the end of the answer.

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.

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

Grade boundaries

Subject or paper	Max mark	Summer 2019 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Biology - 8461 (Foundation)	200	-	-	-	-	130	114	83	51	21

Subject or paper	Max mark	Summer 2019 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Biology - 8461 (Higher)	200	134	120	107	89	72	55	46	-	-

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](https://www.aqa.org.uk/team-stories)

Performance overview

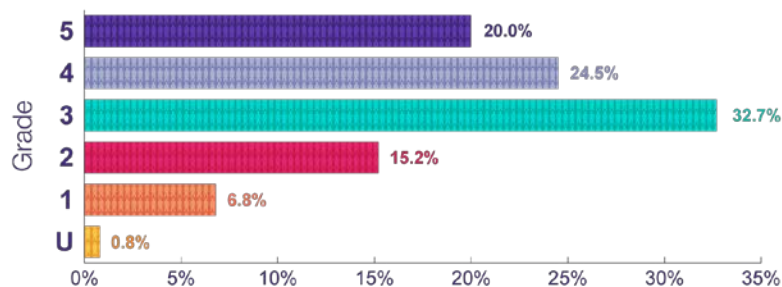
Grade summaries

The figures below represent the performance of those students who entered each tier in Biology 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: Foundation

Grade summary

This shows the percentage of students achieving each grade.

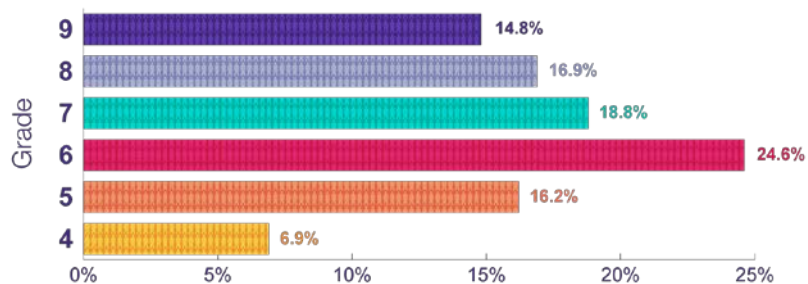


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Grade summary: Higher

Grade summary

This shows the percentage of students achieving each grade.

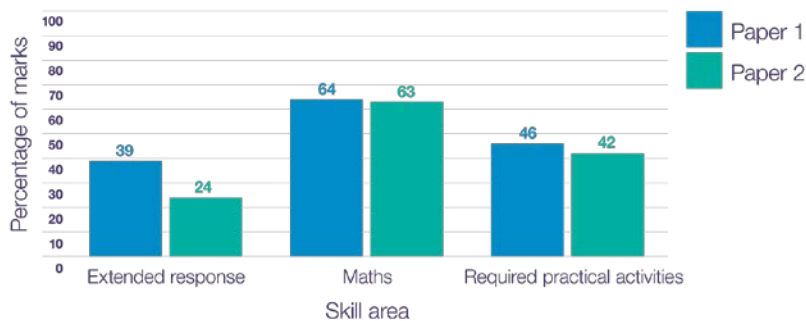


Total achieving (3-U = 1.8%).

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Performance by skill area

Performance of students by skill area – Foundation



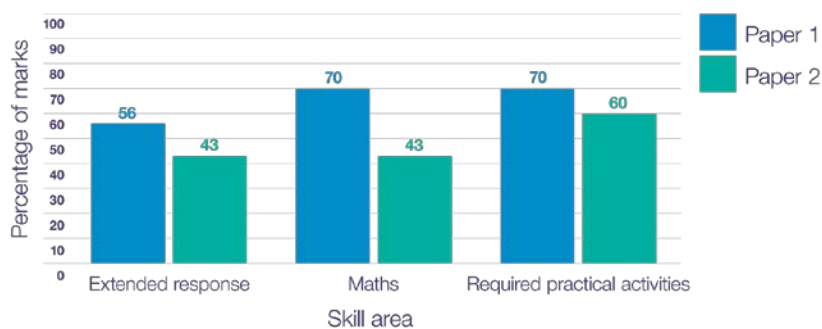
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Performance of students by skill area – Foundation

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



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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.

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 > Biology (new specification) > Reports on the exam

Highlights from summer 2019

Foundation

Themes where students did best	Themes where students did less well
<ul style="list-style-type: none"> <p>Knowledge and understanding: At this level, many students demonstrated secure knowledge and understanding. They had a good understanding of the digestive system, food groups and enzymes. They demonstrated a good understanding of the majority of the content on leaf structure. Many students were very familiar with anaerobic respiration and answered these practical questions well. Students showed a good understanding of bacterial diseases, and how they could be prevented from spreading, as well as a good understanding of the role of antibiotics. The majority of students had an excellent knowledge and understanding of cell structure and function and knew at least one advantage of electron microscopes over light microscopes.</p> <p>Maths skills: Students were competent at calculating means and then using the data in further stepped calculations. The majority of students could measure accurately and apply their reading to calculate the magnification of a cell diagram.</p> 	<ul style="list-style-type: none"> <p>Knowledge and understanding: Many students were not able to demonstrate a secure understanding of some basic biological content. This included identifying parts of the lungs, the function of stoma and how water is lost from leaves. On the standard demand questions (Q6) many students did not have a secure understanding of which organ system the heart is part of or the function of valves and which blood vessels contain valves. Generally students also did not have a secure knowledge of which pathogens caused malaria and what has been used to reduce the number of deaths from malaria each year.</p> <p>Scientific language: There was evidence that some students find it challenging to use or understand the correct scientific language. For example the word ethanol is used rather than the common term alcohol when referring to anaerobic respiration.</p> <p>Command words: In the extended response questions many students did not understand what is required for the command word 'compare'. Students performed better in the later extended response question where they had to describe the defence system of the human body.</p>

	<ul style="list-style-type: none"> Practical based questions: Food tests are one of the Required Practical Activities (RPAs) but many students lacked the basic knowledge of which chemical is used to test for glucose or the resulting colour change. The idea of a control experiment was frequently confused with a control variable. Many also were not able to identify the independent variable in the photosynthesis required practical question or suggest more than one improvement to make the results valid. This was partly due to students not understanding what valid results meant. Constructing graphs: Many students failed to achieve all four marks on the graph question as they were unable to plot an even scale and label the axis correctly, or draw a line a best fit. A significant number of students could not then read a value off their graph.
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Higher

Themes where students did best	Themes where students did less well
<ul style="list-style-type: none"> Knowledge and understanding: At this level, many students demonstrated secure knowledge and understanding of cell structure and function, the causes of malaria and how it is prevented from spreading and how the body protects itself from diseases. The majority of students had a good understanding of photosynthesis and the required practical associated with this, though there were some gaps in experimental knowledge. Higher-attaining students were able to apply their knowledge of the heart to the context of damaged hearts and exercise and could use data in their answers. 	<ul style="list-style-type: none"> Knowledge and understanding: Students were generally not able to give two benefits of understanding the human genome, though most could give one. Often students struggled to demonstrate a secure understanding of how water moves through a plant and how this process is controlled. They were unclear as to the function of stoma. Many students also found it difficult to describe how the small intestines are adapted for diffusion and active transport. This often came down to imprecise use of language or vague answers. Often students could not define the term 'double circulatory system' and did not understand the role of the ventricles. Students found it very challenging to link ideas together from different parts of the specification. This skill was needed when explaining why the axolotl may die in water

with low oxygen. Again precise use of language and vague answers were another cause of poor performance here.

- **Practical based questions:**

As on foundation tier, some students were not able to identify the independent variable in the photosynthesis required practical question or suggest more than one improvement to make the results valid. This was partly due to students not understanding what valid results meant.

A significant number of students failed to achieve all four marks on the graph question as they were unable to plot an even scale and label the axis correctly or draw a line of best fit. However they were able to correctly read off the value from the graph.

- **Command words:**

In the extended response questions, students generally performed well with the describe question but did not understand what is required for the command word 'Evaluate'. Very few students achieved Level 3 as they were unable to make a judgement based on a comparison of both methods.

Paper 2 insights

Foundation

Themes where students did best	Themes where students did less well
<ul style="list-style-type: none"> Knowledge and understanding: At this level, many students demonstrated secure knowledge and understanding. They had a good understanding of the nervous system and the required practical on reaction rates. They clearly understood genetics and inheritance, with the majority of students being able to work out the probability of a characteristic being inherited. Students generally showed a good understanding of food chains and pyramid of biomass. Mathematical skills: Students were usually able to accurately measure images and apply the magnification equation, though some found the unit conversion difficult. They could calculate means but again found the unit conversion difficult. 	<ul style="list-style-type: none"> Knowledge and understanding: Many students were not able to demonstrate a secure understanding of some basic biological content including what is meant by a 'dominant allele'. This may be due to them not being familiar with the phrase 'an allele expressed'. They also found it difficult to suggest why children from the same family were not genetically identical. In the decay question many students could not explain how the rate of decay is affected by a change in oxygen and temperature, nor could they give an environmental factor needed for decay. This again could be due to a poor understanding of scientific terms such as 'an environmental factor'. Many students did not have the basic knowledge of the main fuel gas in biogas. It was evident that many students lacked a good understanding of what urea is and how it moves during dialysis. When interpreting the diagram on how the concentration of urea changed over two weeks, many students failed to read the question carefully enough and answered in terms of days rather than weeks. They also didn't understand that urea builds up between dialysis. Practical based questions: On the part of the RPA question on reaction times, students found it difficult to understand what was meant by evidence to support a conclusion. Although many students could suggest one improvement to the method they failed to give two good answers. This could again be due to students not understanding the term 'valid' as in paper 1. The final question on phototropism was very poorly answered by many students,

	<p>particularly question 09.2 where students had to write a plan. The majority of students got into Level 1. This was due to students not including any controls as specified in the question and a requirement to achieve Level 2. A very small number of students showed how a comparison of different light positions would affect plant growth which was needed for Level 3.</p>
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Higher

Themes where students did best	Themes where students did less well
<ul style="list-style-type: none"> Knowledge and understanding: At this level, many students demonstrated secure knowledge and understanding. They understood ideas on food chains and how factors affect population numbers in a system. Genetics and inheritance were clearly understood with the majority of students being able to construct Punnett squares. Maths skills: Most students demonstrated a general competence in the questions requiring mathematical skills. This included their ability to calculate means, calculating estimated population size and expressing the answer in standard form and calculating changes in the rate of reproduction of bacteria from a graph. 	<ul style="list-style-type: none"> Knowledge and understanding: Generally students were not able to demonstrate a secure understanding of what long-sightedness is; what causes it and how it is corrected. Very few students were able to explain how the ADH stimulates the kidneys to reduce water loss in question 06.3. Question 06.4 was equally challenging as students had to give biological reasons for having kidney transplants rather than the more usual reasons of cost and convenience. Practical based questions: Many students were not able to write a concise accurate plan for the phototropism RPA. The majority of students on this common question got into Level 1. Generally students did not write about controls as specified in the question and needed to access Level 2. Many students didn't appear to be familiar with this practical and had poor understanding of the whole concept of phototropism. The plan for estimating population size was equally challenging for students. Students confused using line transects with random sampling. Many did not know how to correctly take a random sample. Command words: Students often dropped a mark on 'Explain' questions because they just stated a fact and didn't then go on to give a reason for it. A good example of this is question 05.7 where the majority who got one mark stated correctly that the offspring were clones or

	that all would have been genetically identical, but not giving both the fact and the reason.
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Next steps

Access our full suite of insight resources:

- [Results insight video series](#)
- [Enhanced Results Analysis](#)
- [Reports on the exam](#)
- [Live lessons webinars](#)
- [Feedback events](#)
- [Visit Exampro for past papers, related mark schemes and examiner comments.](#)

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