

# GCSE BIOLOGY

Insight report: 2018 results at a glance

Published: October 2018



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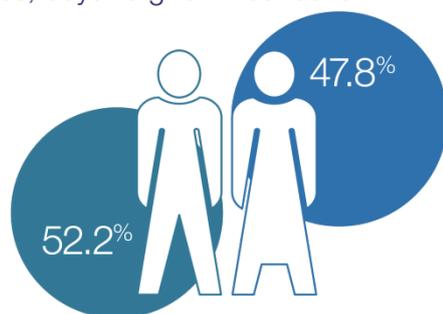
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# Foundation tier analysis

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](http://aqa.org.uk/log-in)

Entry volumes, boys vs girls – Foundation  
16,689 entries



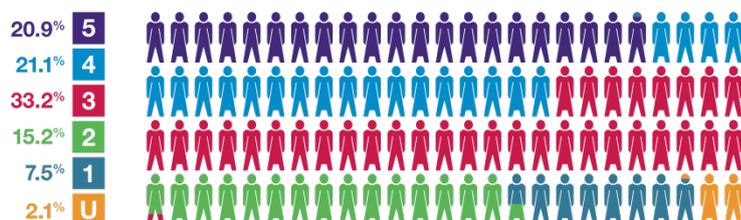
AQA GCSE Biology

Entry volumes, boys vs girls

8,705 boys  
7,984 girls.

Grade summary – Foundation

This shows the percentage of students achieving each grade.



AQA GCSE Biology

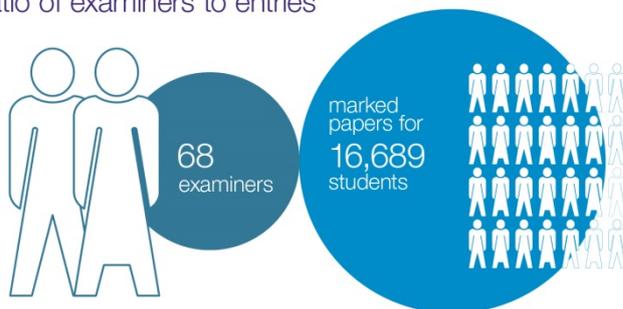
Grade summary

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

# Foundation tier analysis cont.

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Ratio of examiners to entries

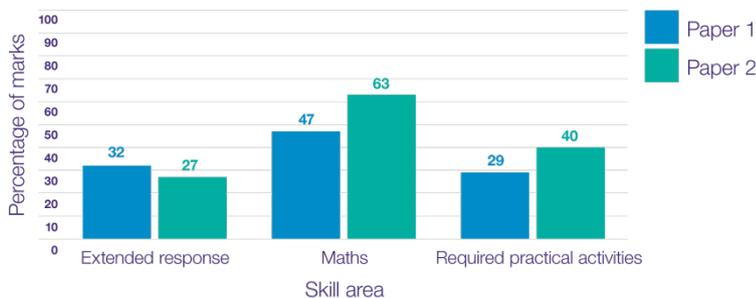


AQA GCSE Biology

Ratio of examiners to entries

68 examiners marked papers for 16,689 students.

Performance of students by skill area – Foundation



AQA GCSE Biology

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.

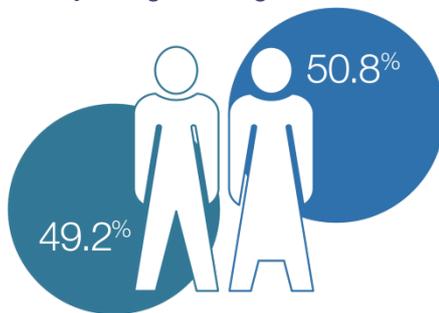
This graphic shows the mean percentage of marks achieved for each skill area.

**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](http://aqa.org.uk/log-in)

Entry volumes, boys vs girls – Higher  
112,832 entries



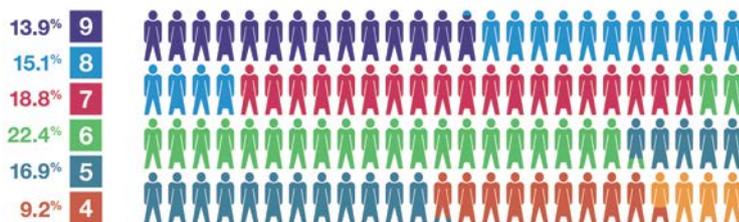
AQA GCSE Biology

Entry volumes, boys vs girls

55,547 boys  
57,285 girls.

Grade summary – Higher

This shows the percentage of students achieving each grade.



\*The yellow figures represent the remaining grade levels 3–U.

AQA GCSE Biology

Grade summary

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

# 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](http://aqa.org.uk/log-in)

Ratio of examiners to entries

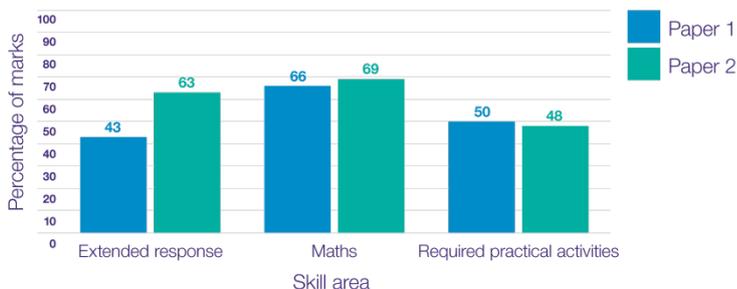


AQA GCSE Biology

Ratio of examiners to entries

826 examiners marked papers for 112,832 students.

Performance of students by skill area – Higher



AQA GCSE Biology

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
Biology - 8461 (Higher)	200	132	117	102	85	69	53	37	-	-

Subject or paper	Max mark	Summer 2018 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Biology - 8461 (Foundation)	200	-	-	-	-	121	107	80	53	26

## 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](http://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/biology-cpd](http://aqa.org.uk/biology-cpd)**

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## Qualification summary

This was the first year of the reformed specification. Students appear to have been well prepared, and coped well with the increased length of the paper. Students made a good attempt at all the questions but imprecise language caused issues in some responses. Most students were able to answer questions that required basic maths skills but many struggled when these were put in a scientific context.

Students not reading the question properly or not following instructions were both common themes across all papers. This was particularly the case for multiple choice questions, where some students did not give the correct number of responses. As with our legacy specifications students still find it difficult to understand the difference between 'describe' and 'explain' and what is required when the command word 'compare' is used.

## 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.

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# 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](http://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 2018

### Practical based questions

Many students seemed unfamiliar with the 'food test' required practical, referring to iodine or Benedict's solution instead of Biuret reagent when testing for protein. This was also the case on the higher tier. Students were not aware of safety aspects appropriate at GCSE level – safety aspects need to be relevant to the particular practical and go beyond low level general precautions such as tying hair back or wearing a lab coat. The second question based on a required practical proved equally challenging. It was clear that many did not fully understand why they had carried out each practical step, taken specific measurements, and what collected data showed.

### Scientific terminology

Marks were lost where answers lacked specificity and made general references instead of using biological terms; for example 'to the sun' rather than to light/sunlight, or using the word 'it' ambiguously. If chemical formulae are given instead of the words they needed to be correct; H<sub>2</sub>O is incorrect. Many students didn't understand the concept of 'repeatable' or its significance.

### Mathematical skills

Although most were able to do many basic maths calculations, some lost marks converting units, for example blood flow into dm<sup>3</sup>. Recognising that diagrams were using different scales and magnification caused some difficulty. Incorrect rounding and not giving an answer to three significant figures cost a number of students' marks in the final question.

### Knowledge and understanding

Students struggled with some of basic biological knowledge including the difference between mitosis with meiosis, which organ produces protease, what happens during fertilisation and the process by which sugars are transported around the body. The distinction between respiration and gas exchange continues to confuse students. Some found it difficult to link a number of different ideas together to construct short extended answers. These linking questions are challenging – a good understanding of biological concepts is needed rather than just basic recall in a familiar context (as was seen in the question on the rate of decay with earthworms).

**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](http://aqa.org.uk/log-in)**

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# Paper 1, Higher

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## Highlights from summer 2018

### Practical based questions

On the Higher tier many students did better on the common question assessing the required practical on antibiotics. This was expected, but vague answers with insufficient detail meant students lost marks. Some didn't understand what repeatable meant, to gain full marks they needed a reference to the idea of seeing **if** the results were similar.

When put in slightly unfamiliar context, students found it difficult to transfer their knowledge of practicals – for example when eggs rather than potatoes were used as the model of the cell in the osmosis experiment. This indicates a shortfall in understanding of the scientific principles of osmosis, and of what's being done and why during this practical. Rote learning of methods will not allow full access to marks on any required practical questions. This was very evident when students were asked details of the modifications required to the experiment.

The final required practical assessment was more successful, with most students knowing the test for protein, but many failing to read the question correctly – not going on to explain the tests for the different carbohydrates that they were very familiar with.

### Scientific terminology and command words

Students still misunderstood requirements when the command word 'compare' was used. A basic description isn't sufficient. Using subject specific vocabulary will help as well in developing this type of writing.

A common misconception about energy persists, with many students still referring to energy being made, created or produced rather than released.

Some students didn't read the question carefully or follow the instructions, failing to label diagrams when answer lines weren't provided. Many lost marks on the pacemaker question due to this.

### Mathematical skills

Basic maths skills were much better applied at this level and most students were successful at

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rounding to three significant figures. The completion of the graph was generally very good, but marks were lost due to incomplete labelling of the x-axis or use of inappropriate units.

Despite the positives some students still struggled with simpler maths, for example confusing median with mean.

### Knowledge and understanding

There were some general gaps in knowledge – for example relatively few students knew what a pace pacemaker is used to treat. The new area of the specification on stem cells ([4.1.2.3](#)) is not fully understood yet.

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# Paper 2, 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](http://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 2018

### Practical based questions

There was still some confusion over working scientifically terms, including a 'control' and a 'control variable'. Inappropriate uses of 'accurate', 'precise', 'reproducible', 'repeatable' and 'valid' were seen when explaining why different steps in practicals were taking place in. As in legacy papers, students didn't realise that the term 'fair' needs to be suitably qualified. Some students still struggle with the concept of sampling. Using working scientific terms and explaining why steps are being carried out while teaching this practical will help students access these questions fully.

### Mathematical skills

Most students were able to do the basic maths calculations on the paper. However, some showed a lack of precision while reading data from a graph, for example reading a small square as '0.1' unit instead of 0.2 in question 5.4.

### Knowledge and understanding

Some students struggled with basic biological knowledge including knowing when fertilisation was most likely to occur, the structure of the eye, and how fossils are formed.

As in paper 1, the use of language caused problems when explaining the concept of energy. Many students wrote that energy is 'produced', 'made' or 'created' rather than released.

Descriptions of the process of natural selection were frequently poor with little understanding that there had to be pre-existing variation.

The majority of students had a good understanding of genetics however a significant number of students were not able to apply basic definitions of terms such as 'genotype' and 'homozygous'.

Describing the 'coordinating a reflex' action has always been challenging for Foundation students and this was still apparent in the extended response question. 37% of students achieved zero marks.

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# Paper 2, Higher

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## Highlights from summer 2018

### Practical-based questions

There was lots of polarity on the 'factors affecting the distribution of plants' required practical question. Many showed good understanding, but 36% of students gained no marks at all.

The geotropism question indicated many students lacked real understanding of working scientific terms such as 'control', 'precision' and 'valid', as well as uncertainty of what to do with anomalous results. It also showed discomfort applying knowledge from the specification to a practical that was presented using an unfamiliar experiment.

### Linking ideas and full explanations

Students often demonstrated knowledge of basic biological facts on most topics, but were challenged when required to think more deeply (eg to link ideas together to form a logical explanation). Examples included:

- Q5 on advantages of sexual reproduction for bluebells
- Q7.4 on why sewage caused fish to die
- Q8.4 on changes in amino acid structure and enzymes working
- Q8.8 (the high demand question) on selective breeding.

### Mathematical skills

Students lost marks because they forgot to convert their final answer to a number in standard form or did not give their answer correct to two significant figures when asked. Difficulty transferring basic maths skills was evident, with 20% of students not understanding the term mode.

### Knowledge and understanding

Knowledge of the structure of the eye was well understood except for how the iris contracts to change size of the pupil. Describing the reflex action was also well answered. Students structured answers logically and had a good understanding of the process.

The terms respiration and breathing were frequently confused, as were the terms genotype and phenotype. Other significant challenges included recalling names of classification groups and how to structure a binomial name.

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be without Teachit!’

Vivienne Neale, Teacher

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departments.’

Sonja Dolloway, Leader of Science

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