

PEARSON EDEXCEL INTERNATIONAL GCSE (9-1)

BIOLOGY

GETTING READY TO TEACH

Event code: 4BI1/19IF01

First teaching in 2017, first assessment in 2019.



Aims and objectives

- Introduce the idea of assessment objectives – what they are and why they are used when writing examination papers?
- Analyse recent question papers and learn which types of question match the different assessment objectives
- Investigate different assessment objectives by looking at candidates' responses and feedback from previous exam series
- Discuss how different teaching strategies can help students access questions that target the different assessment objectives
- Review the support Pearson offers for the qualification
- Network, discuss best practice, and share ideas with other teachers

Timetable for the day

Time	Item
09.30	Welcome Tea and coffee
10.00	Agenda and introductions
10.15	International GCSE Features / Introduction to the new Edexcel International GCSE in Biology
11.00	Assessment Objectives using grids
11.30	Break
12.00	Looking at student responses AO1 How to improve AO1 skills
13.00	Lunch
13.45	Looking at student responses AO2 How to improve AO2 skills
14.30	Looking at student responses AO3 How to improve AO3 skills
15.15	Tea
15.30	Lessons from the examinations
16.00	Final questions

Welcome to Pearson Edexcel

Welcome to Pearson Edexcel,
the world's leading learning company
and the UK's largest awarding body.

We set the standard for worldwide
recognised qualifications, built on the
UK educational system and accepted
by universities worldwide.

We have a simple mission:
to help make a measurable impact on
improving people's lives through
learning.

**“We judge
ourselves – and
invite others to
judge us – not by
the products that
we make but by
the impact on
learners.”**

John Fallon,
Chief Executive Officer, Pearson

Key features of the new International GCSE

- Reviewed and updated in light of UK GCSE changes
- Consultation with teachers and higher education institutions
- Dedicated textbooks are available
- New 9-1 grading scale
- Transferable skills embedded
- Pearson World Class Qualifications design principles
- Examinations available in January and June
- Dedicated Subject Adviser

“Grade 9 is not the same as A*; it’s a new grade, designed to recognise the very highest performing students.”

Ofqual

The new 9-1 grading scale structure

- The new grading scales gives teachers more information about students' attainment to help progression to A level, and universities more information when looking at accepting students into higher education
- The new grade 9 represents a new level of attainment and we've introduced this to really differentiate top performing students
- There's greater differentiation in the middle of the range of grades, with three grades (4, 5 and 6) instead of two grades (grades B and C)
- Using the same scale for Pearson Edexcel GCSE and International GCSE allows clear comparison with English standards, unlike the A*-G scale

NEW GRADING STRUCTURE	CURRENT GRADING STRUCTURE
9	A*
8	
7	
6	B
5	
4	
3	C
2	
1	
U	U

Biology qualification content summary

There continue to be five topic areas in the specification:

Nature and variety of living organisms:

- Characteristics of living organisms
- Variety of living organisms

Structures and functions in living organisms:

- Organisation
- Cell structure
- Bio molecules
- Movement in and out of cells
- Nutrition
- Respiration
- Gas exchange
- Transport
- Excretion
- Coordination and response

Reproduction and inheritance:

- Reproduction
- Inheritance

Ecology and the environment:

- Organisms in environment
- Feeding relationships
- Cycles within ecosystems
- Human influences on environment

Use of biological resources:

- Food production
- Selective breeding
- Genetic modification
- Cloning

Summary of assessment

FAMILIAR ...

100% external assessment – with no coursework

Linear assessment – all exams take in the same exam session

Mixture of question types – all marked with ‘points-based’ mark schemes

Single tier of entry (untiered)

Each paper will have some longer questions (4–6 marks)

AND NEW

Maths skills (10% in biology)

Multi-choice questions

More data analysis

What is the balance of Assessment Objectives?

- How many AOs are used in the assessments?
- What are they?
- What is the current weighting?

Assessment Objectives

AO1

Knowledge and
understanding of
biology

40%
of total marks

AO2

Application of
knowledge and
understanding,
analysis and
evaluation of biology

40%
of total marks

AO3

Experimental skills,
analysis and
evaluation of data
and methods in
biology

20%
of total marks

How were 2019 papers different from previous ones? Activity 1

1. Consider how the reformed papers were different from those from the previous specification.
2. Write down four observations from your centre or from your students.
3. Compare your observations with those of other delegates on your table.

Assessment summary

Paper 1

Two hours; 110 marks

Paper 2

One hour and 15 minutes; 70 marks

Both papers will contain a mixture of AO1, AO2 and AO3

The AO3 questions are likely to be in a practical context

Assessment summary

There will be two examination papers:

Paper 1

will **not** include the specification statements printed in **bold**.

Paper 2

includes **all** the specification statements, including those printed in **bold**.

Both papers have similar question types

INTERNATIONAL GCSE BIOLOGY

Double Award (Science) and Single Award (Science)



Science (double award)

- The grouping of topics in a more logical way leads to more changes here than to separate sciences
- Students take Paper 1 in biology, chemistry and physics
- Students achieve two grades, based on performance across all three papers
- The two grades may not be the same
- Students may still progress to A level

Looking at Assessment Objective grids: Activity 2

Look at the June 2019 paper 1B. Each Item in each question is classified in terms of:

- Content or specification reference
- Assessment Objective
- Target grade
- Question type

Looking at Assessment Objective grids: Activity 2

The grid for the first question of paper 1B June 2019 looks like this:

Biology Paper 1B

Q	Total marks (110)	Spec ref	AO1 (44±2)	AO2 (44±2)	AO3 (22±1)	Grade 1-3 (30)	Grade 4-6 (40)	Grade 7-9 (40)	Maths skill ref	Maths (11)	Recall (16)	MCQ/Objective (6 to 10)	Question Type
1 a	4	2.2	4			3	1				4		
1 b i	1	2.4	1			1							
1 b ii	3	2.21	3			1	2						
1 c	2	2.3	2				2						

Looking at Assessment Objective grids: Activity 2

Look at the June 2019 paper 1B. Now for all items in Questions 2, 3, 4 and 5 classify these in terms of:

- Content or specification reference
- Assessment Objective
- Target grade
- Question type
- Compare your answers with those of other delegates

Looking at Assessment Objective grids: Activity 2

The grid for these questions on paper 1B June 2019 looks like this:

Biology Paper 1B

Q	Total marks (110)	Spec ref	AO1 (44±2)	AO2 (44±2)	AO3 (22±1)	Grade 1-3 (30)	Grade 4-6 (40)	Grade 7-9 (40)	Maths skill ref	Maths (11)	Recall (16)	MCQ/Objective (6 to 10)	Question Type
2 a	1	2.29	1			1						1	MC
2 b	3	2.25	3			1	1	1					
2 c i	2	2.24		2			1	1		2			
2 c ii	6	2.24 2.25		3	3	2	2	2					
2 d	3	3.14 5.12	3				1	2			3		
3 a	3	4.6/4.7		3		1	2						
3 b	4	4.8	4				2	2					
3 c	4	3.38	2	2			2	2					
4 a	3	2.15/2.17		3		1	1	1					
4 b	3	2.17			3	1	1	1					
5 a	1	2.29	1			1					1	1	MC
5 b i	2	3.6			2		1	1					
5 b ii	1	2.23			1			1				1	MC
5 b iii	3	3.6		3			2	1	5C	3			
5 c i	2	3.5		2			1	1	4A 4D	2			
5 c ii	2	3.5	1	1			2	1					

Assessment Objective 1

Activity 3

Looking at student responses on AO1 items from June 2109 Paper 1:

1. Look at Question 3b.
2. Without reference to published mark scheme, rank order samples A–D.
3. Compare your order with that of other delegates.
4. Now use the published mark scheme to mark samples A–D.
5. Compare your marks with those of other delegates.

Assessment Objective 1

Activity 4

Looking at student responses on AO 1 items from June 2109 Paper 1:

1. Look at Question 9b.
2. Without reference to the published mark scheme, rank order samples A–C.
3. Compare your order with that of other delegates.
4. Now, use the published mark scheme to mark samples A–C.
5. Compare your marks with those of other delegates.

How can we improve student responses on AO1?

- What strategies do you use in your centres to ensure that students are well prepared for AO1 items?
- How do we check the students' knowledge and understanding of each topic?
- What strategies work particularly well?
- How is it best to check on learning?
- How can we ensure language is precise and the depth of understanding adequate for IGCSE?

How can we improve student responses on AO1?

- Within the classroom
- Teaching strategies
- Use the specification
- Use past papers
- Use textbook
- Use tests
- Use the published mark schemes
- Use examiner reports

Assessment Objective 2

Activity 5

Looking at student responses on AO2 items from June 2109 Paper 1:

1. Look at Question 4a.
2. Without reference to the published mark scheme, rank order samples A–D.
3. Compare your order with that of other delegates.
4. Now, use the published mark scheme to mark samples A–D.
5. Compare your marks with those of other delegates.

Assessment Objective 2

Activity 6

Looking at student responses on AO 2 items from June 2109 Paper 1:

1. Look at Question 5b(iii).
2. Without reference to published the mark scheme, rank order samples A–D.
3. Compare your order with that of other delegates.
4. Now, use the published mark scheme to mark samples A–D.
5. Compare your marks with those of other delegates.

How can we improve student responses on AO2?

- What strategies do use in your centres to ensure that students are well prepared for AO2 items ?
- How do we check the students' application of their knowledge and understanding of each topic?
- What strategies work particularly well?
- How is it best to check on this kind of understanding?
- How can we ensure language is precise and the depth of understanding adequate for IGCSE?

How can we improve student responses on AO2?

- Within the classroom
- Teaching strategies
- Use the specification
- Use past papers
- Ensure students understand 'command words'
- Use textbook
- Use tests
- Use the published mark schemes
- Use examiner reports

Command words

- What are command words and what information do they give?
- Where do we find command words?

In two places:

- in the specification
- in the question papers

Command words

- All our qualifications in International GCSE sciences now use a common taxonomy for command words
- These can be found in an appendix at the back of the specification
- Students can still expect a range of command words across the demand range of the exam paper:
 - for example: Paper 1, Question 2c (ii) Discuss
 - for example: Paper 1, Question 8b Comment

Command words

Appendix 5: Command words

The following table lists the command words used in the external assessments.

Command word	Definition
Add/Label	Requires the addition or labelling of a stimulus material given in the question, for example labelling a diagram or adding units to a table.
Calculate	Obtain a numerical answer, showing relevant working.
Comment on	Requires the synthesis of a number of variables from data/information to form a judgement.
Complete	Requires the completion of a table/diagram.
Deduce	Draw/reach conclusion(s) from the information provided.
Describe	To give an account of something. Statements in the response need to be developed, as they are often linked but do not need to include a justification or reason.
Determine	The answer must have an element that is quantitative from the stimulus provided, or must show how the answer can be reached quantitatively. To gain maximum marks, there must be a quantitative element to the answer.
Design	Plan or invent a procedure from existing principles/ideas.
Discuss	<ul style="list-style-type: none"> Identify the issue/situation/problem/argument that is being assessed within the question. Explore all aspects of an issue/situation/problem/argument. Investigate the issue/situation etc. by reasoning or argument.
Draw	Produce a diagram either using a ruler or freehand.
Estimate	Find an approximate value, number or quantity from a diagram/given data or through a calculation.
Evaluate	Review information (e.g. data, methods) then bring it together to form a conclusion, drawing on evidence including strengths, weaknesses, alternative actions, relevant data or information. Come to a supported judgement of a subject's quality and relate it to its context.
Explain	An explanation requires a justification/exemplification of a point. The answer must contain some element of reasoning/justification – this can include mathematical explanations.
Give/State/Name	All of these command words are really synonyms. They generally all require recall of one or more pieces of information.
Give a reason/reasons	When a statement has been made and the requirement is only to give the reason(s) why.
Identify	Usually requires some key information to be selected from a given stimulus/resource.

Command words

Command word	Definition
Justify	Give evidence to support (either the statement given in the question or an earlier answer).
Plot	Produce a graph by marking points accurately on a grid from data that is provided and then draw a line of best fit through these points. A suitable scale and appropriately labelled axes must be included if these are not provided in the question.
Predict	Give an expected result.
Show that	Verify the statement given in the question.
Sketch	Produce a freehand drawing. For a graph, this would need a line and labelled axes with important features indicated. The axes are not scaled.
State what is meant by	When the meaning of a term is expected but there are different ways for how these can be described.
Suggest	Use your knowledge to propose a solution to a problem in a novel context.
Verb proceeding a command word	
Analyse the data/graph to explain	Examine the data/graph in detail to provide an explanation.
Multiple choice questions	
What, Why	Direct command words used for multiple-choice questions.

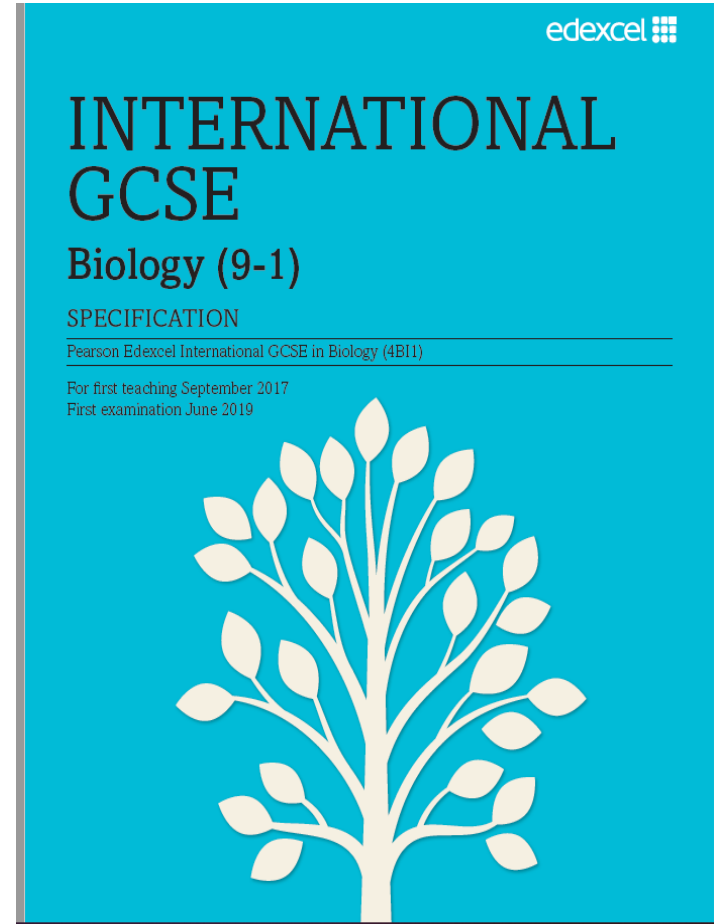
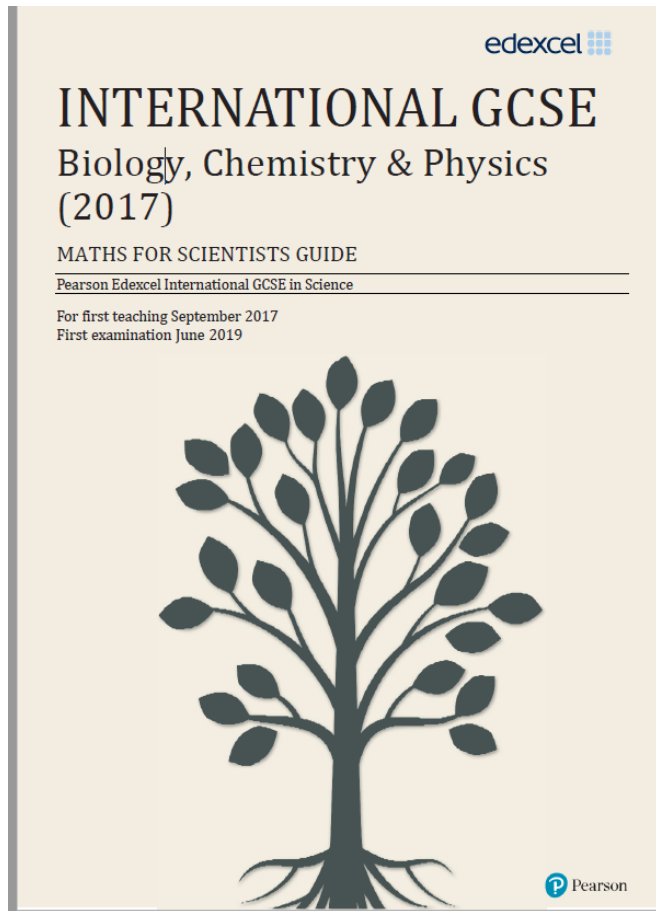
Mathematical skills

- The development and use of relevant mathematical skills is key to progress in science subjects
- A list of mathematical skills which should be developed appears in the Appendix for each specification
- These skills will be tested in exam papers within the context of the science
- Assessment of mathematical skills will account for 10% of marks in biology, 20% in chemistry, and 30% in physics

Mathematical skills

- What opportunities exist within the specification to develop mathematical skills?
- What classroom activities do you use to help students improve these skills?
- Compare your thoughts with those of other delegates

AO2 Teaching mathematics content



AO2 Teaching mathematics content

- Teach maths skills to students
- Use maths guide
- Learn units including cm^2 and cm^3
- Learn to use standard form
- Understand formulae
- Practise questions

AO2 Teaching mathematics content

		B	C	P
1	Arithmetic and numerical computation			
A	Recognise and use numbers in decimal form	✓	✓	✓
B	Recognise and use numbers in standard form	✓	✓	✓
C	Use ratios, fractions, percentages, powers and roots	✓	✓	✓
D	Make estimates of the results of simple calculations, without using a calculator	✓		✓
E	Use calculators to handle $\sin x$ and $\sin^{-1} x$, where x is expressed in degrees			✓
2	Handling data			
A	Use an appropriate number of significant figures	✓	✓	✓
B	Understand and find the arithmetic mean (average)	✓	✓	✓
C	Construct and interpret bar charts	✓	✓	✓
D	Construct and interpret frequency tables, diagrams and histograms	✓		✓
E	Understand the principles of sampling as applied to scientific data	✓		
F	Understand simple probability	✓	✓	✓
G	Understand the terms mode and median	✓		
H	Use a scatter diagram to identify a pattern or trend between two variables	✓	✓	✓
I	Make order of magnitude calculations	✓	✓	✓
3	Algebra			
A	Understand and use the symbols $<$, $>$, \propto , \sim		✓	✓
B	Change the subject of an equation	✓	✓	✓
C	Substitute numerical values into algebraic equations using appropriate units for physical quantities	✓	✓	✓
D	Solve simple algebraic equations	✓	✓	✓

AO2 Teaching mathematics content

		B	C	P
4	Graphs			
A	Translate information between graphical and numerical form	✓	✓	✓
B	Understand that $y = mx + c$ represents a linear relationship		✓	✓
C	Plot two variables (discrete and continuous) from experimental or other data	✓	✓	✓
D	Determine the slope and intercept of a linear graph	✓	✓	✓
E	Understand, draw and use the slope of a tangent to a curve as a measure of rate of change		✓	✓
F	Understand the physical significance of area between a curve and the x -axis, and measure it by counting squares as appropriate			✓

		B	C	P
5	Geometry and trigonometry			
A	Use angular measures in degrees			✓
B	Visualise and represent 2D and 3D objects, including two dimensional representations of 3D objects			✓
C	Calculate areas of triangles and rectangles, surface areas and volumes of cubes	✓		✓

Practical skills in examinations

Students may be tested on their ability to:

Describe and plan experiments

Draw conclusions which are consistent with the evidence, using scientific knowledge and understanding

Describe safe and appropriate practical techniques

Communicate findings from experimental activities using appropriate vocabulary, calculations and graphs

Analyse and interpret data from experimental activities

Evaluate data and methods

Assessment Objective 3

Activity 7

Looking at student responses on AO3 items from June 2109 Paper 1.

1. Look at Question 4b.
2. Without reference to the published mark scheme, rank order samples A–D.
3. Compare your order with that of other delegates.
4. Now, use the published mark scheme to mark samples A–D.
5. Compare your marks with those of other delegates.

Assessment Objective 3

Activity 8

Looking at student responses on AO3 items from June 2109 Paper 1.

1. Look at Question 10c.
2. Without reference to the published mark scheme, rank order samples A–D.
3. Compare your order with that of other delegates.
4. Now, use the published mark scheme to mark samples A–D.
5. Compare your marks with those of other delegates.

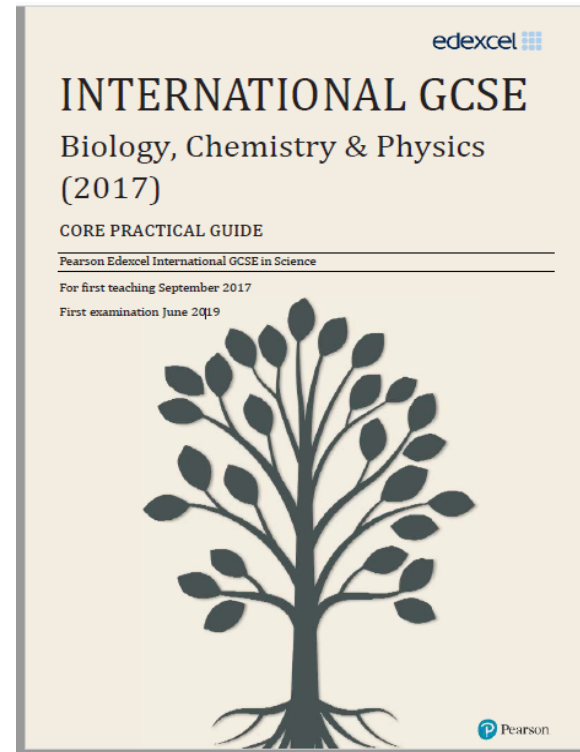
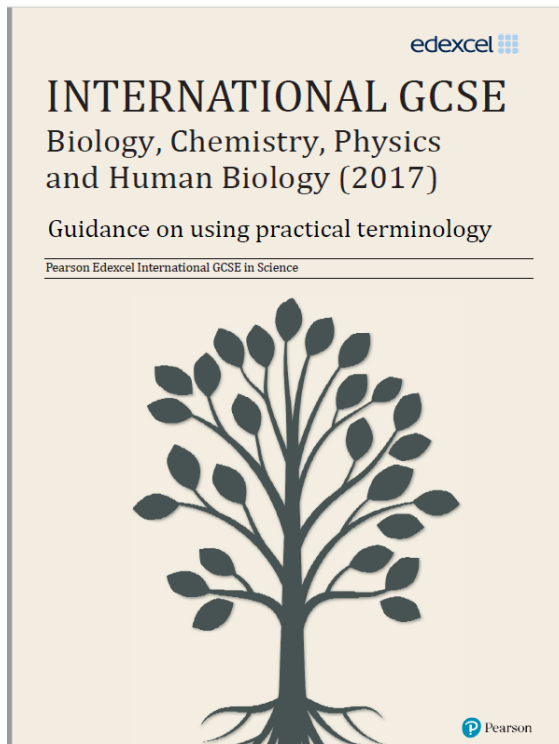
How can we improve student responses on AO3?

- What strategies do you use in your centres to ensure that students are well prepared for AO3 items?
- How do we check the students' knowledge and understanding of experimental design and procedures?
- What strategies work particularly well?
- How is it best to check on understanding of experimental design and procedures?
- How can we ensure language is precise and the depth of understanding adequate for IGCSE?

How can we improve student responses on AO3?

- Within the classroom
- Teaching strategies
- Do all of the core practicals
- Use specification
- Use past papers
- Use textbook
- Use tests
- Use mark schemes
- Use examiner reports

How can we improve student responses on AO3?



Lessons from first reformed series

- The new qualification was examined for the first time in this June series. The examiners were impressed with the standard of student responses.
- Centres have prepared students well for the new style of questions and the new areas of specification content.
- There was little evidence of students running out of time on the paper and most students attempted all questions.

Lessons from first reformed series

Based on their performance on this series of papers, students are offered the following advice:

- Ensure that you read the question carefully and include sufficient points to gain full credit
- For discuss items, include points for and against, and make sure that you include as many points as there are marks available
- For evaluate items, include points for and against, and make sure that you include as many points as there are marks available; reach a conclusion that reflects the points you have made
- Make sure you have practiced calculations and understand and know how to apply any formulae
- Write in detail and use correct and precise biological terminology

Lessons from first reformed series

- Make sure you have expressed your answer in the correct units and ensure you know the relationship between linear, squared and cubed units such as mm^3 and dm^3
- Remember to use the knowledge and skills acquired during practical work to help in questions about unfamiliar or novel practical procedures
- Questions require students to make links between different parts of the specification, so when considering an question remember to use all the knowledge and understanding you have gained throughout the specification
- For experimental design questions, always be able to: name the independent variable and give the range of values; name the dependent variable and how you are going to measure it, and name the control variables and explain how these will be controlled
- Always read through your responses and ensure that what you have written makes sense and answers the question fully

Teaching and learning support overview

Getting Started Guide
and scheme of work

Getting Ready to
Teach events

Subject interpretation
of transferable skills

Subject Advisor

Results Plus and
ExamWizard

Regional Support
Manager

Curriculum matched
publishing

Topic guides

Additional SAMs

Exemplar marked
responses with
commentaries

Access to Scripts

Published resources

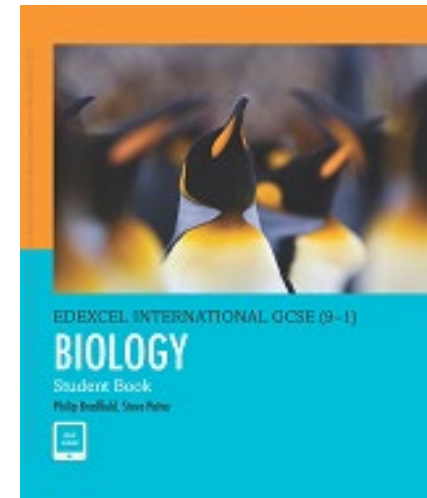
We are committed to helping teachers deliver our Pearson Edexcel qualifications and helping students to achieve their full potential.

To do this, we aim for our qualifications to be supported by a wide range of high-quality resources, produced by a range of publishers.

However, it is not necessary to purchase endorsed resources to deliver our qualifications.

Pearson published resources

- Each book provides free access to an ActiveBook, a digital version of the Student Book, which can be accessed online, anytime, anywhere supporting learning beyond the classroom
- Chapters are mapped closely to the specification to provide comprehensive coverage
- Learning is embedded with exercises, source materials and exam practice throughout
- Transferable skills, needed for progression into higher education and employment, are signposted allowing students to understand, and engage with, the skills they are gaining
- A fully integrated Progression Map tool allows quick and easy formative assessment of student progress, linked to guidance on how to personalise learning solutions
- Reviewed by a language specialist to ensure the book is written in a clear and accessible style for students whose first language may not be English





ResultsPlus is the free online results analysis tool for teachers – it provides analysis features that other similar solutions don't.

- Provides a detailed breakdown of student performance in Edexcel exams.
- Helps identify topics where the student can benefit from further learning and allows this knowledge to inform teaching strategies and approaches.
- Provides a comparison of student performance at regional level.
- Allows you to view your school's performance against other Pearson Edexcel schools in your country. You can also find student results analysis from their previous Pearson Edexcel school.
- Mock exams results can also be fed into the system to produce an analysis.
- ResultsPlus Direct gives your students access to their final grades and performance breakdown, wherever they are.
- Sign up for free ResultsPlus account in just a few quick and easy steps [here](#).
- Access additional video guides here:
 - [ResultPlus - Individual Student Analysis](#)
 - [ResultsPlus - Cohort Analysis](#)
 - [ResultsPlus - Mock Analysis](#)
 - [ResultsPlus - Global Analysis](#)



examWizard is a free tool for teachers containing a bank of past paper questions to help create their own bespoke mock exams and tests to focus on particular topic areas as needed:

- Use existing mark schemes for accurate marking
- Use existing examiner report for insight
- Use the results to understand where students need more support, informing teaching strategies

Unlike other similar question banks, examWizard is:

- Available free to all Edexcel centres
- Updated with latest questions faster, following the exam series
- One-stop-shop for assessment material with access to whole past papers and examiner reports as well as the ability to construct bespoke ones easily with content tagged to specific attributes

New Access to Scripts (ATS) online portal

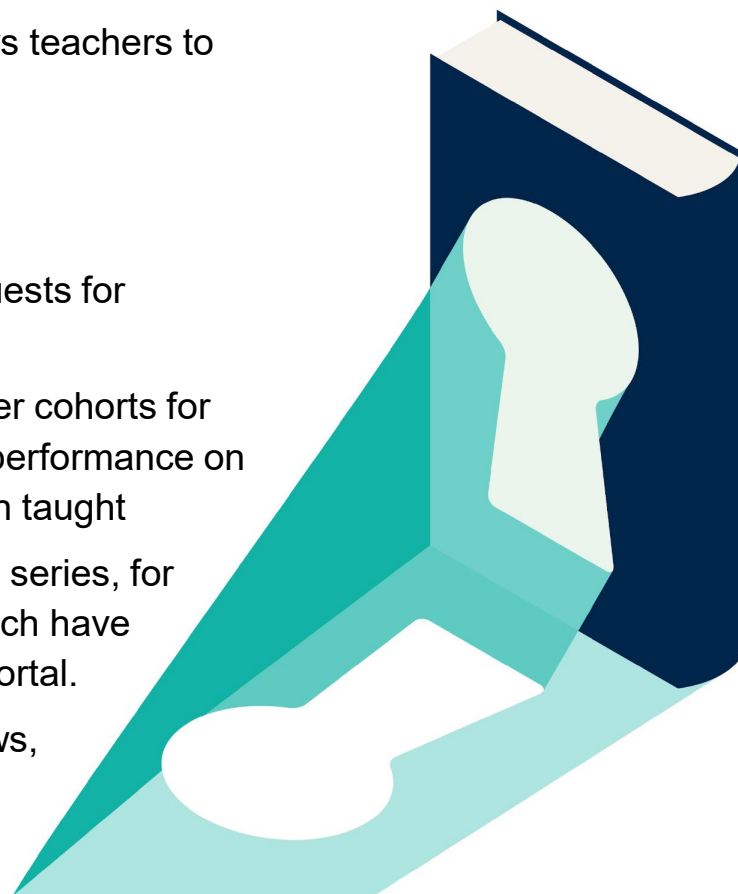
Access to Scripts (ATS) is a free online portal which allows teachers to immediately access electronically marked exam papers

Provides enhanced transparency and:

- Offers transparent approach to marking process
- Provides better understanding of marking before requests for enquiries about results are made
- Provides excellent aid for teaching and preparing other cohorts for examinations by helping you to evaluate a student's performance on particular questions in relation to what they have been taught

Available instantly from results day for all our examination series, for a defined window, you can view and download scripts which have been marked online free of charge from our self-service portal.

For more information on ATS, and the post results windows, visit our [post-results pages here](#).



Pearson International schools community

Connect with international teachers around the world.

- Connect with other teachers working in international schools and join groups who have shared interests, subjects or location
- Read topical news and articles and share yours
- Advertise jobs at your school or find job opportunities
- Download free resources
- Sign up for events

Sign up today at: community.pearsoninternationalschools.com



Other useful links

1. Grade Boundaries: This page shows the minimum marks needed to achieve a certain grade for all UK and international examinations. Also refer to the examiners report which is available for download with other documents.
2. Examination Results Statistics: Results statistics summarise the overall grade outcomes of candidates sitting Pearson Edexcel examinations.

Thank you

Find out more about us at:
<http://qualifications.pearson.com>