

Pearson Edexcel  
**International A Level  
Science**

Enhancing Teaching Through  
Exam Insights





# Agenda

- Specification
- Production of exam papers
- Development of Mark Schemes
- Marking Activity and Examiner Reports
- Support



# Aims and Objectives

- Introduce the writing process of the Pearson Edexcel Examination Papers and Mark Schemes
- Understand how to apply mark schemes to student answers from the 2024 May/June Examination series
- Review the support Pearson offers for teaching the qualification
- Network, discuss best practice and share ideas with other teachers



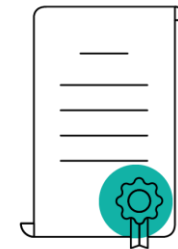
# Welcome to Pearson

# Welcome to Pearson Edexcel

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# Quick overview of the Specification

# Overview of the specification: IAS

Unit	Topic
1. Molecules, Diet, Transport and Health	1. Molecules, Transport and Health
	2. Membranes, Proteins, DNA and Gene expression
2. Cells, Development, Biodiversity and Conservation	3. Cell structure, Reproduction and Development
	4. Plant structure and function, Biodiversity and Conservation
3. Practical Skills in Biology I	Experimental skills acquired from the study of Units 1 and 2

# Overview of the specification: IA2

Unit	Topic
4. Energy, Environment, Microbiology and Immunity	5. Energy flow, Ecosystems and the Environment
	6. Microbiology, Immunity and Forensics
5. Respiration, Internal environment, Coordination and Gene Expression	7. Respiration, Muscles and the Internal environment
	8. Coordination, Response and Gene technology
6. Practical Skills in Biology II	Experimental skills acquired from the study of Units 1, 2, 4 and 5



# What are assessment objectives?

Code	Description	% in IAS	% in IA2	% in IAL
AO1	Demonstrate knowledge and understanding of science	36-39	31-34	34-37
AO2	a) Application of knowledge and understanding of science in familiar and unfamiliar contexts	34-36	33-36	33-36
	b) Analysis and evaluation of scientific information to make judgements and reach conclusions	9-11	14-16	11-14
AO3	Experimental skills in science, including analysis and evaluation of data and methods	17-18	17-18	17-18

# WBI11 and WBI12

Unit		Content overview	Assessment
1	<p>Written examination:</p> <ul style="list-style-type: none"><li>• 1 hour and 30 minutes</li><li>• Available in January, June and October</li></ul>	<p>Topic 1: Molecules, Transport and Health</p> <p>Topic 2: Membranes, Proteins, DNA and Gene Expression</p>	<ul style="list-style-type: none"><li>• Multiple choice, short-open, open-response, calculations and extended-writing questions</li><li>• Points-based and level-based marks</li><li>• A minimum of 8 marks targeting mathematics at level 2</li><li>• Application of knowledge and understanding to familiar and unfamiliar contexts</li></ul>
2		<p>Topic 3: Cell structure, Reproduction and Development</p> <p>Topic 4: Plant Structure and Function, Biodiversity and Conservation</p>	

# WBI13


Unit 3	Content overview	Assessment
<p>Written examination:</p> <ul style="list-style-type: none"><li>• 1 hour and 20 minutes</li><li>• Available in January, June and October</li><li>• 50 marks</li><li>• 20% of IAS</li><li>• 10% of IAL</li></ul>	<p>Experimental Skills and Knowledge and Understanding of Experimental Techniques Developed in Units 1 and 2 (topics 1 to 4)</p>	<ul style="list-style-type: none"><li>• Short-open, open-response and calculations questions</li><li>• Points-based and level-based marks</li><li>• A minimum of 5 marks targeting mathematics at level 2</li><li>• Application of knowledge and understanding to familiar and unfamiliar contexts</li></ul>

# WBI14 and WBI15

Unit		Content overview	Assessment
4	Written examination: <ul style="list-style-type: none"><li>• 1 hour and 45 minutes</li><li>• Available in January, June and October</li></ul>	Topic 5: Energy Flow, Ecosystems and the Environment	<ul style="list-style-type: none"><li>• Multiple choice, short-open, open-response, calculations and extended-writing questions</li><li>• Points-based and level-based marks</li><li>• 10–15 marks draw on IAS topics</li><li>• A minimum of 9 marks targeting mathematics at level 2</li><li>• Application of knowledge and understanding to familiar and unfamiliar contexts</li><li>• Pre-release reading (scientific article) for Unit 5</li></ul>
5		Topic 6: Microbiology, Immunity and Forensics Topic 7: Respiration, Muscles and the Environment Topic 8: Coordination, Response and Gene Technology	

# WBI16

Unit 6	Content overview	Assessment
Written examination: 1 hour and 20 minutes Available in January, June and October 50 marks 20% of IAS 10% of IAL	Experimental Skills and Knowledge and Understanding of Experimental Techniques Developed in Units 1, 2, 4 and 5	<ul style="list-style-type: none"><li>• Short-open, open-response and calculations questions</li><li>• Points-based and level-based marks</li><li>• A minimum of 5 marks targeting mathematics at level 2</li><li>• Application of knowledge and understanding to familiar and unfamiliar contexts</li></ul>



# Writing the Exam Paper

- Papers are written by the Principal Examiner for that Unit
- The paper is then reviewed by the Chair of examiners and other senior examiners
- The paper is amended to take account of the recommendations
- The final paper is produced by the Principal Examiner following discussion with the Chair and Chief of examiners



# Mapping

- Before the paper goes to print, all aspects are mapped to check the correct distribution;
- Correct number of marks for each AO
- Maths marks of 10%
- Multiple choice questions 10%
- Even coverage of the topics in the specification



# Standardisation of Examiners

- Examiners undertake rigorous training to ensure marking is consistent
- The PE selects a number of Practice items and 10 Qualification items for each item
- Examiners work through the practice items then mark the qualification items
- If they get 8 out of 10 correct, they can continue marking
- Team leaders carry out random checks through out the marking period



# Command Words

# Command words and Assessment Objectives

Code	Description	Command words
AO1	Demonstrate knowledge and understanding of science	Compare and Contrast, Complete, Describe, Draw, State / Name / Give, Explain, Suggest, Most MCQs
AO2	a) Application of knowledge and understanding of science in familiar and unfamiliar contexts	Calculate, Describe, Determine, Explain, Show, Suggest
	b) Analysis and evaluation of scientific information to make judgements and reach conclusions	Assess, Comment, Criticise, Describe, Discuss, Evaluate, Explain, Suggest
AO3	Experimental skills in science, including analysis and evaluation of data and methods	Any command word used in Units 3 and 6 examination papers



# Producing a Mark Scheme

- Initial mark scheme produced at the same time as the paper
- Amended in line with the final draft of the paper
- Further changes are made after the exam is sat
- Examiners mark 15 of each question and feed back to the PE any changes that are required



## Activity 1

(c) Describe the events that occur during prophase of mitosis.  
(2)

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Question Number	Answer	Additional guidance	Mark
<b>2(c)</b>	<p>A description that makes reference to two of the following points:</p> <ul style="list-style-type: none"> <li>• {chromosomes / chromatin / DNA / chromatid} condense (1)</li> <li>• nuclear {envelope / membrane} breaks down (1)</li> <li>• centrioles {move to poles of the cell / produce spindle fibres / produce microtubules} (1)</li> </ul>	<p>ACCEPT {DNA / chromatin} coils around histones ACCEPT chromatin starts forming chromosomes</p> <p>ACCEPT nuclear {envelope / membrane} disappears / nucleolus disappears</p> <p>ACCEPT spindle fibres form without ref to centrioles ACCEPT centrosome for centriole REJECT centromere for centriole</p>	<b>(2)</b>



(iii) Explain three ways in which a mammalian egg cell is specialised for its functions.

(3)

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Question Number	Answer	Additional guidance	Mark
4(b)(iii)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• (egg cells are) {haploid / contain one copy of each chromosome} (1)</li> <li>• to ensure the zygote {is diploid / has two copies of each chromosome} (1)</li> <li>• (egg cell) has {cortical granules / zona pellucida} which {prevent polyspermy / additional sperm cells entering egg cell} (1)</li> <li>• (egg cell) has {lipid / oil / fat} (droplets) as a source of energy / mitochondria which {release energy / provide ATP} (1)</li> </ul>	<p>only mp2 can be awarded if referring to incorrect gamete</p> <p>ACCEPT so fertilised egg cell {is diploid / has two copies of each chromosome} ACCEPT diploid {zygote / embryo} after fertilisation</p> <p>ACCEPT cortical granules to harden zona pellucida after fertilisation IGNORE jelly coat</p> <p>IGNORE produce energy ACCEPT large so can contain more lipids ACCEPT {lipid (droplets) / protein / carbohydrates} for {production of new cell components / growth of embryo} ACCEPT lipids converted to glucose IGNORE {food / nutrient} stores ACCEPT releases chemicals to attract sperm</p>	(3)



## Activity 2

(b) Different species of fungus can break down different molecules in wood.

The effect of two species of fungus on the percentage loss in mass of wooden blocks was investigated.

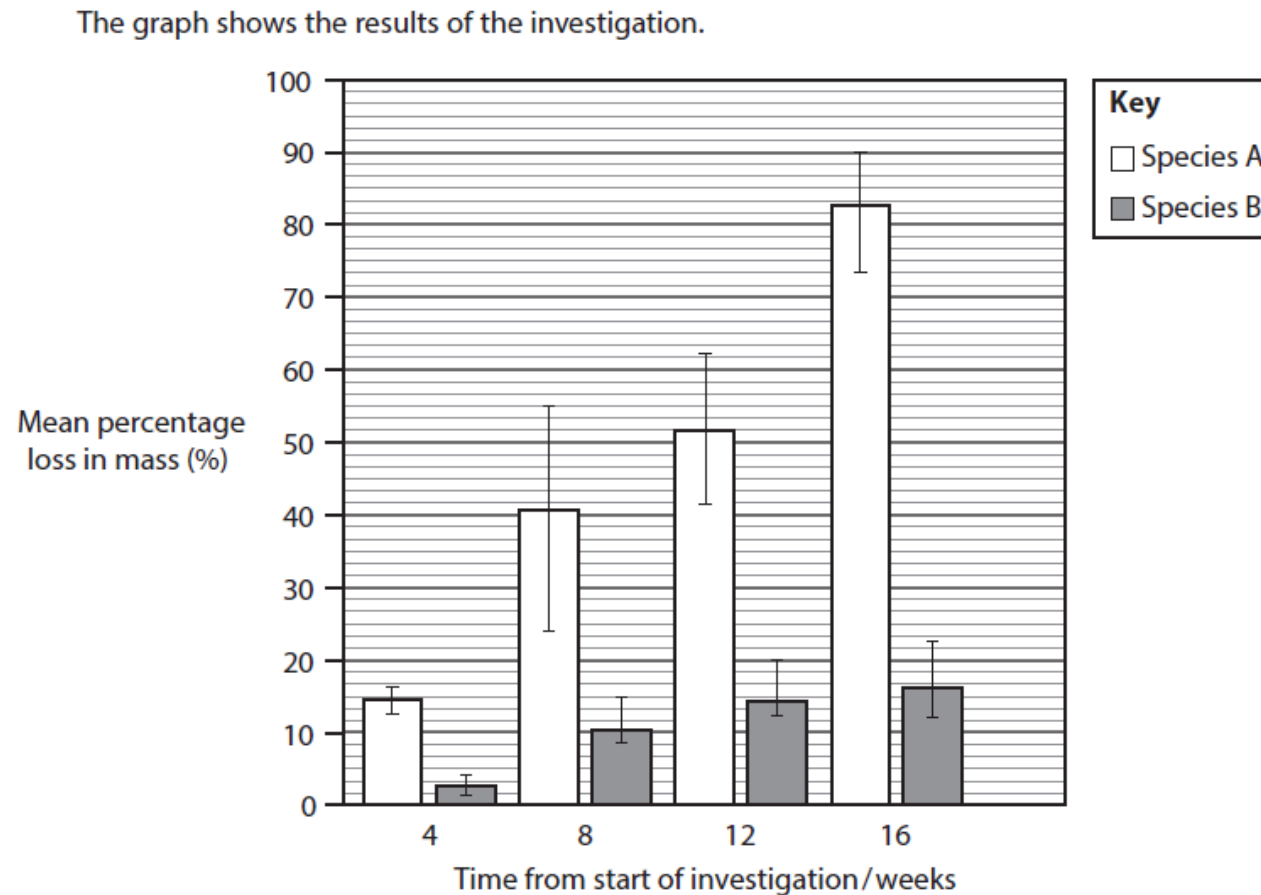
Species A was grown on one set of wood blocks and species B was grown on another set of wood blocks.

The percentage loss in mass of the blocks was recorded every four weeks.

The graph shows the results of the investigation.



(i) Comment on the results of this investigation.





<ul style="list-style-type: none"><li>• as time increases the mean percentage loss in mass increases (1)</li><li>• there is a higher percentage mass loss with species A (at each time point) / species A digests more wood / {rate of mass loss / digestion} is faster for species A (1)</li><li>• significant difference between the two species as the {error / range / SD} bars do not overlap / species B is significantly lower than A as the {error / range / SD} bars do not overlap (or converse) (1)</li></ul>	<p>ACCEPT positive correlation ACCEPT as time increases the wood blocks mass decreases</p> <p>ACCEPT species A is more effective at breaking down wood molecules ACCEPT converse for species B ACCEPT correct calculated difference ACCEPT {steeper / non-linear} increase in mass loss in species A ACCEPT converse for species B / rate decreases over time for B</p> <p>ACCEPT correct statements regarding specific species and specific time period {error / range / SD} bars overlap linked to significant difference ACCEPT correct statements regarding specific species and specific time period {error / range / SD} bars size linked to {repeatability / validity}</p> <p>IGNORE bars do not overlap so no significant difference unqualified IGNORE incorrect statements regarding {error / range / SD} e.g. there is overlap of bars between species A&amp; B</p>	<b>(3)</b>
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# Examiners report

This question provides candidates with information regarding an investigation into the digestion of molecules in wood blocks by two different species of fungus. Candidates are asked to comment on the results of the investigation, which involved the synthesis of a number of factors from the provided information in order to provide a judgement. The command word definition states that more than two factors need to be synthesised.

Nearly all candidates could correctly interpret the given data to make the judgement that there was a higher mass loss in the blocks with species A. Most candidates also stated that the mean percentage mass loss increased as time increased. However, candidates needed to be clear which part of the data they were referring to if they referred to overlapping/non-overlapping of the data. Vague responses were not creditworthy. Some candidates correctly identified specific parts of the graph where there was/wasn't overlap, but did not correctly explain the significance of this.

(i) Comment on the results of this investigation.

- ~~needs to~~ species A has higher <sup>82% loss in mass<sup>(3)</sup></sup> ~~break~~ ~~the~~ mean % loss in mass suggests higher ~~a~~ ~~an~~ ~~enzymes~~ works at optimum level than species B where the highest is at 16% in 6 weeks
- species B is weaker
- ~~the~~ sample size ~~add~~
- conditions given including temperature, ~~a~~ humidity size of fungus ~~are~~ needs to be taken account.

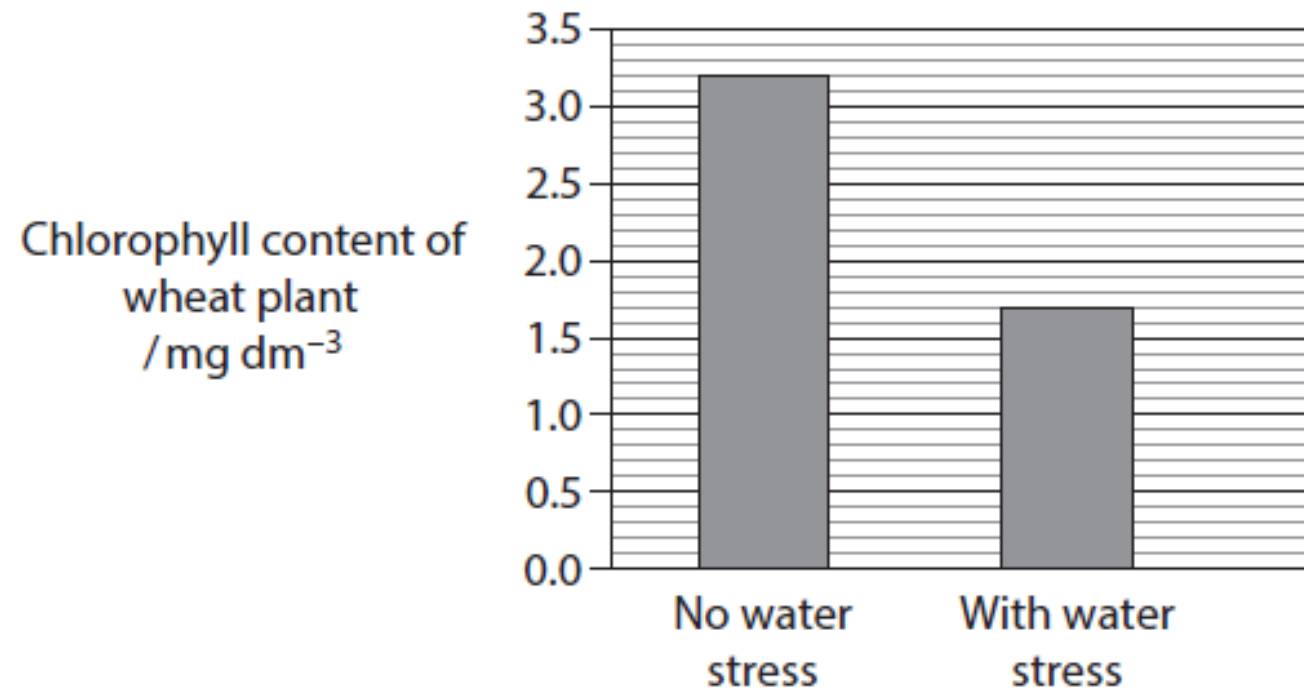


This response is awarded mark point 2.

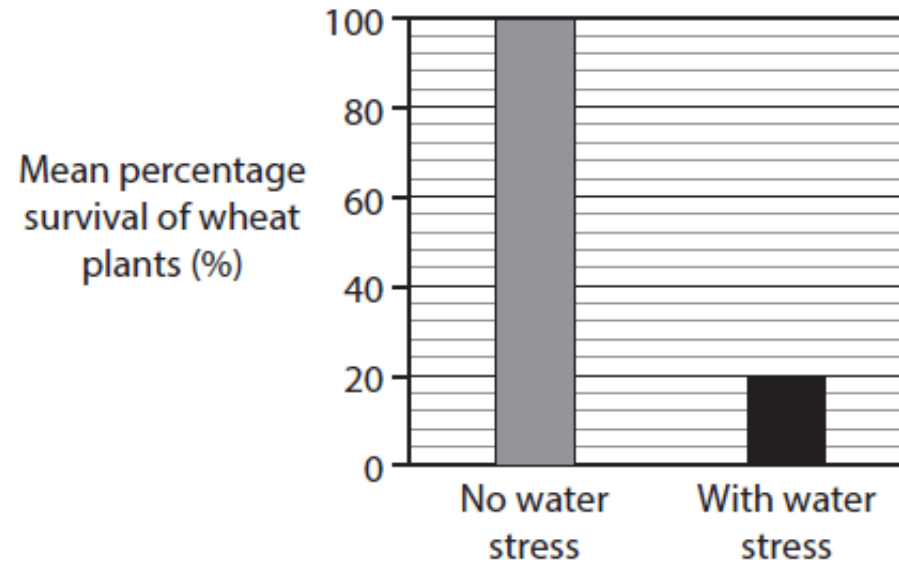
# Activity 3

The effect of water stress on the chlorophyll content of a wheat plant was investigated.

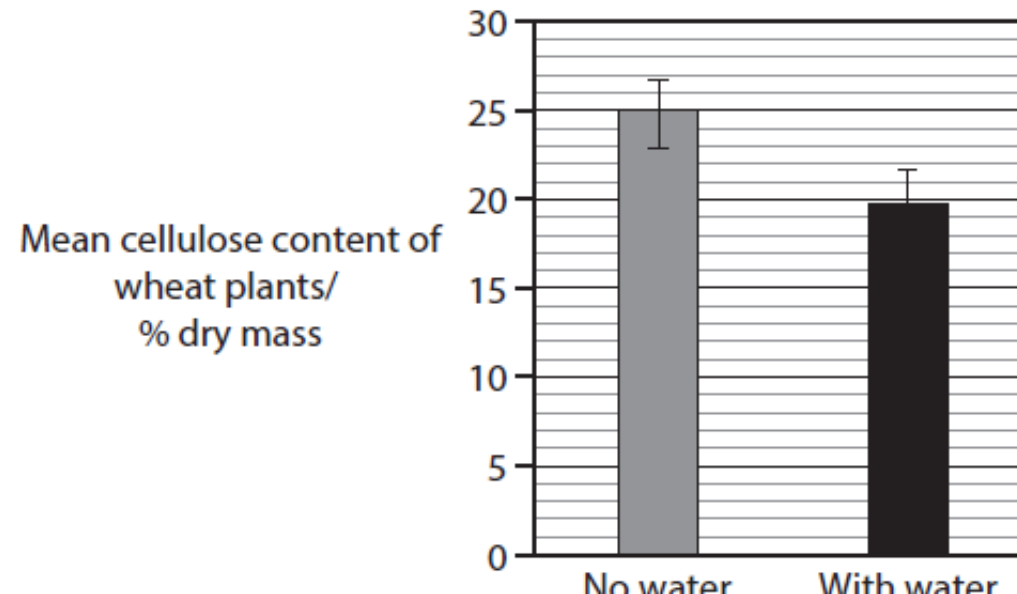
The results are shown in the graph.



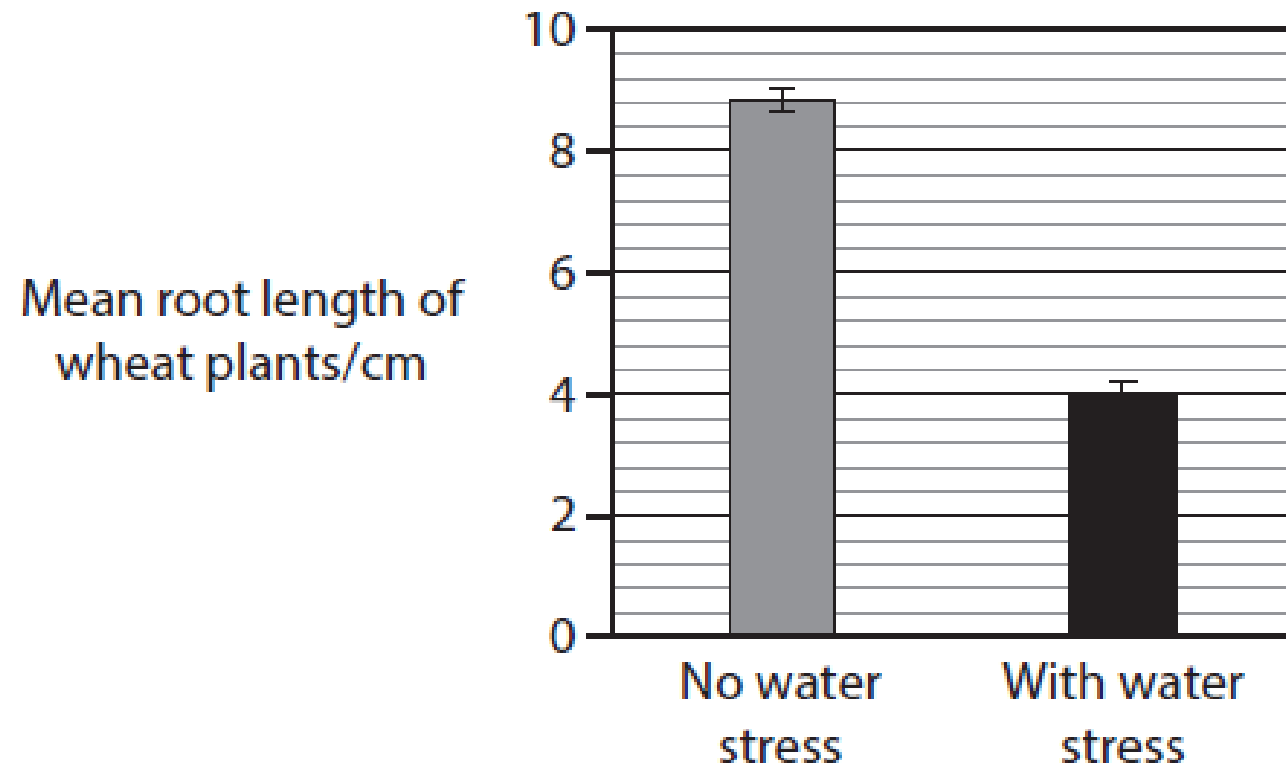
Graph A shows the effect of water stress on percentage survival rate.



Graph B shows the effect of water stress on cellulose content.



Graph C shows the effect of water stress on root length.







Deduce how water stress could affect the growth of wheat plants.

Use information from the whole of Question 6 and your own knowledge to support your answer.

# Indicative content

- there {is a lower (percentage) survival rate / are fewer plants} when there is water stress / converse
- plants with water stress have a lower cellulose content / converse
- plants with water stress have {a smaller root length / roots that are 4.5 cm smaller} / converse
- plants with water stress have lower chlorophyll content / converse
- relevant comment regarding validity of data / significant difference between the groups
  
- lower cellulose content results in {{thinner/ weaker} cell walls / fewer cells / reduced tensile strength} / converse
- {thinner cell walls / reduced calcium pectate} will result in less growth due to less support (for plants) / converse
  
- smaller roots will absorb {less water / fewer mineral ions} in plant / converse
  
- fewer magnesium ions results in reduced chlorophyll formation
- fewer nitrates' results in reduced {amino acid / protein / chlorophyll / DNA} formation
- fewer calcium ions results in reduced {calcium pectate / middle lamella} formation
- less water results in {reduced photosynthesis / reduced metabolic reactions / increased wilting of plant / reduced turgidity / closure of stomata / reduced transpiration / less uptake of mineral ions}
  
- reduced chlorophyll results in {fewer chloroplasts / less light absorption / reduced photosynthesis}
- reduced photosynthetic rate results in reduced production of named photosynthetic product e.g. glucose
- reduced  $\beta$ -glucose results in reduced cellulose formation / reduced  $\alpha$ -glucose linked to reduced respiration
- reduced {protein synthesis / photosynthetic products / mitosis} would result in decreased {growth / seed production / yield} of plants



		Additional guidance
Level 0	0	No awardable content
Level 1	1-2	Limited number of the most important or relevant factors from the data/information provided are synthesised.  No judgement is made.
Level 2	3-4	Some of the most important or relevant scientific factors from the data/information provided are synthesised.  A limited accurate judgement is made.
Level 3	5-6	Most of the important or relevant scientific factors from the data/information provided are synthesised.  A detailed and accurate judgement is made.



# Examiners report

This is the only level-based question on this paper. Candidates are given information regarding the effect of water stress on three aspects to do with wheat plants.

Many candidates also included aspects relating to the graph in Q05(b). Candidates usually achieved level 1 by giving correct conclusion(s) from the four graphs. To move into levels 2 and 3, candidates need to use their biological knowledge and understanding. The most common way that candidates accessed level 2 was by linking the reduction in chlorophyll or water to a reduction in photosynthesis. Other candidates accessed level 2 by considering why the chlorophyll content had reduced. The more detailed responses accessed level 3 by also considering how smaller roots would affect the absorption of water/ mineral ions and the effect of reduced cellulose content on cell wall tensile strength.

Deduce how water stress could affect the growth of wheat plants.

Use information from the whole of Question 6 and your own knowledge to support your answer.

(6)

Water stress swells cells

No stress causes much greater levels of cellulose content, (by 5.2%), <sup>larger</sup> root length (by 2.5cm) chlorophyll by 47%, which are all needed for growth of wheat and to obtain nutrients from soil (roots) and convert sunlight to <sup>(chlorophyll)</sup> energy, and cellulose for strength

Water stress reduces these factors, thus reduces growth as wheat will be deprived of nutrients from soil (short roots), energy (chlorophyll) and be more likely to break in wind (cellulose)



This is an example of a level 1 response, where the candidate hasn't used their own knowledge to support their answer.



## Activity 4 - Unit 6 Question

*Saccharomyces cerevisiae* is a type of yeast. It is a single-celled organism which is widely used in brewing and baking.

Describe an experiment to investigate the effect of temperature on the rate of respiration in yeast, using an artificial hydrogen carrier (redox indicator).

# Mark scheme

Question Number	Answer	Additional Guidance	Mark
1(b)	<p>A description that contains five of the following:</p> <ul style="list-style-type: none"> <li>• range of five suitable temperatures used (1)</li> <li>• use of thermostatic waterbath (1)</li> <li>• incubate yeast and indicator separately to reach same temperature (1)</li> <li>• suitable named indicator used (1)</li> <li>• record time taken for colour to change (1)</li> <li>• identification of one variable (1)</li> <li>• repeats and calculate { means/SD's } (to compare) (1)</li> </ul>	<p><b>Accept</b> temperatures between 5 and 45°C (ignore additional temperatures outside the range)</p> <p><b>Accept</b> waterbath set at a stated temperature</p> <p><b>Accept</b> to equilibrate/acclimatise</p> <p><b>Accept</b> TTC / DCPIP / methylene blue</p> <p>ignore stated colours</p> <p><b>Accept:</b> pH  {volume / conc/mass/strain/type} of yeast suspension/ volume/conc of TTC  Ignore species</p> <p><b>Accept</b> average</p>	<p><b>Exp</b> <b>(5)</b></p>





# Examiners Report

This question asks candidates to describe an experiment to investigate the effect of temperature on the rate of respiration in yeast, using an artificial hydrogen acceptor.

(b) Describe an experiment to investigate the effect of temperature on the rate of respiration in yeast, using an artificial hydrogen carrier (redox indicator).

(5)

The dependent variable in this investigation is the time taken for DCPIP to change color from blue to colorless. Produce <sup>5</sup> solutions of glucose and add yeast suspension to it. Ensure that you add the same mass of yeast suspension and that the concentration of glucose in each solution is kept constant by adding same mass of glucose in each. Produce a water baths of 5 varying temperatures ranges i.e; ~~5°C~~, 10°C, 20°C, 30°C, 40°C and 50°C. Place test tubes containing yeast suspension within water baths and measure the time taken for color to change from blue to colorless. Repeat to obtain mean values of time at each temperature range. Ensure that the pH remains constant using a buffer solution. To calculate the rate <sup>of respiration</sup> use the formula,

$$\text{rate} = \frac{1}{\text{time taken}}$$

for each temperature. Ensure that you work near a bunsen flame to maintain a sterile environment and prevent contamination of yeast suspension.



This answer does not describe how to control temperature adequately, however, four aspects of the method are given credit.



## Activity 5

The Chamorro people of Guam eat flying foxes, a type of bat, as part of their diet.

Scientists in Guam suggested there was a link between the diet of these people and the high incidence of the neuro-degenerative disease amyotrophic lateral sclerosis (ALS) in their population.

(ii) The diagnosis of ALS is made using positron emission tomography (PET) scans and computed tomography (CT) scans of the brain and nervous tissue.

Compare and contrast these two techniques

Question Number	Answer	Additional guidance	Mark
<b>5(b)(ii)</b>	<p>An answer that includes three of the following points:</p> <p><b>Similarity</b></p> <ul style="list-style-type: none"> <li>• both can produce an image (of the brain and nervous tissue) (1)</li> <li>• both are non-invasive procedures (1)</li> </ul> <p><b>Difference (max 2)</b></p> <ul style="list-style-type: none"> <li>• CT uses {x-rays / electron beams} whereas PET {uses {tracers / isotopes} / detects production of gamma rays} (1)</li> <li>• CT is {quicker / cheaper} (than PET scan) (1)</li> <li>• PET scan can show {(metabolic) activity / biochemical changes} (whereas CT scan does not) (1)</li> </ul>	<p>2 max for differences</p> <p>ignore references to 2D / 3D</p> <p>ACCEPT named tracer e.g. (radioactive) glucose</p> <p>ACCEPT PET scan {takes longer / more expensive} (than a CT scan)</p> <p>ACCEPT PET scan can {show which parts of the brain are active / assess brain activity / show brain function} (whereas CT does not)</p>	<b>(3)</b>



# Examiners report

This question expects candidates to compare and contrast the use of positron emission tomography (PET) and computed tomography (CT) scans of the brain and nervous tissue to diagnose ALS.

The command words 'compare and contrast' are key here. There needs to be a clear comparison ideally in the same sentence. At a stretch, the next sentence may be acceptable. However when the comparison is in a separate paragraph this is not deemed to be in the nature of compare and contrast.

Many candidates struggled to find similarities apart from images formed. However, they found differences easier and often gave three or four differences – this can still only achieve a maximum of 2 marks for difference.

- (ii) The diagnosis of ALS is made using positron emission tomography (PET) scans and computed tomography (CT) scans of the brain and nervous tissue.

Compare and contrast these two techniques.

(3)

### Similarities

- Both techniques ~~used~~ produce 2D, low resolution <sup>image</sup> of a cross-section of the body.
- Both are expensive. &
- Both can be used to detect cancer growth in brain etc.

### Differences

- CT scan uses X-rays whereas PET scan uses gamma radiation.
- PET scan uses radioactive tracer but CT scan does not.
- CT scans are images frozen in time so we cannot see how activity ~~of~~ in different brain areas change. But PET scans can be used to show biochemical changes in the brain.



3 marks: A clear comparison about images and two clear differences.





# Activity 5

Mammals produce ATP by anaerobic and aerobic respiration.

(a) The effect of exercise intensity on the lactate concentration in human blood was investigated.

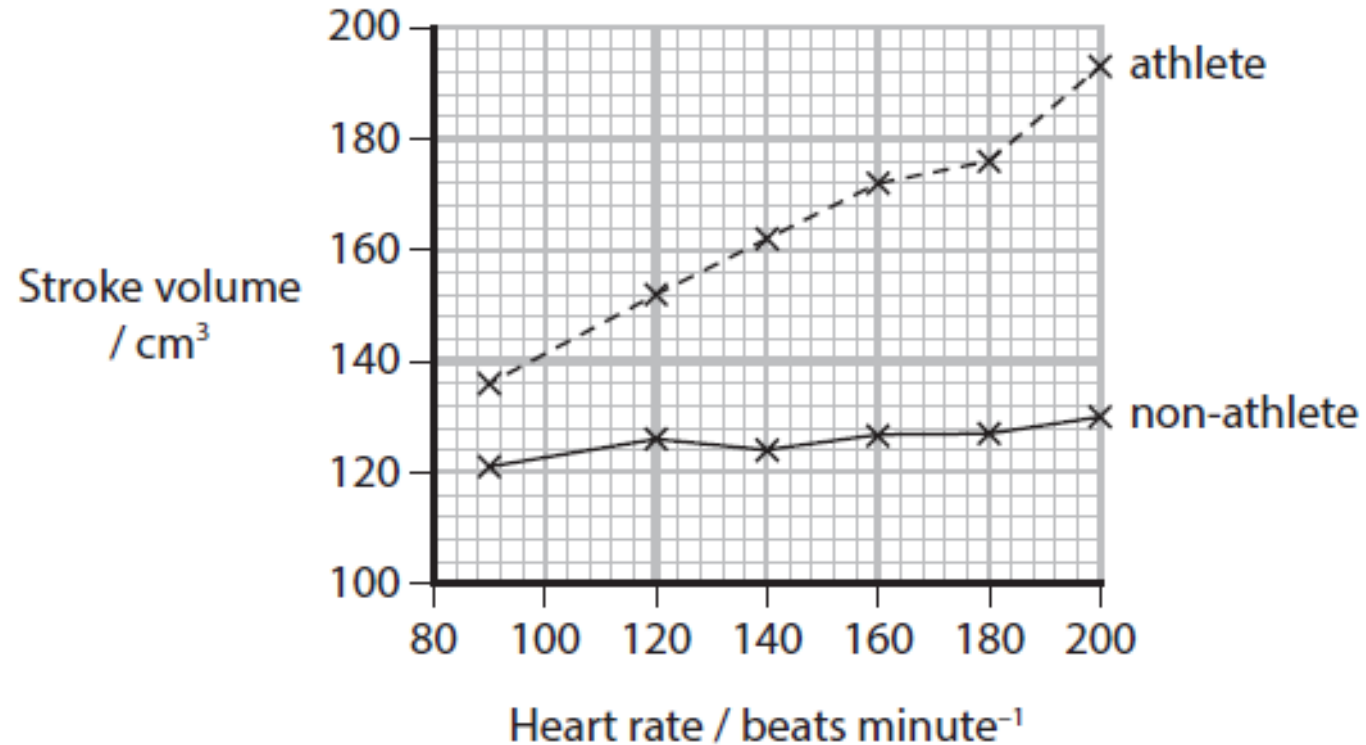
- An athlete and a non-athlete performed the same exercise at the same intensity for three minutes.
- Their blood lactate concentrations were measured as soon as they finished exercising.
- This was repeated for different intensities of exercise.

\*(ii) The table and graph show some of the results of this investigation.

Intensity of exercise / a.u.	Lactate concentration in blood / mmol dm <sup>-3</sup>	
	Athlete	Non-athlete
0	1.0	1.5
60	1.1	2.2
120	1.4	3.7
180	3.2	6.2
240	6.4	10.0

Stroke volume is the volume of blood that leaves each ventricle during ventricular systole.

The graph shows the stroke volumes of the athlete and the non-athlete at different heart rates.





Explain the results of this investigation.

Use the information in the graph and the table and your own knowledge to support your answer.

(6)

# Indicative content

1 and 2

- blood lactate increases with increasing intensity of exercise
- stroke volume increases with increasing heart rate
- positive correlation between heart rate and stroke volume for athlete / little change in stroke volume for non-athlete as heart rate increases/ stroke volume always higher in athlete than non-athlete
- non athletes started at a higher lactate concentration than athletes/ converse / athletes lactate always lower in non-athletes
- any use of data from lactate concentration table
- any use of data from stroke volume graph

3

- blood lactate levels increase because there is anaerobic respiration occurring / insufficient oxygen available for aerobic respiration / oxygen stores used up
- anaerobic respiration produces lactate / lactate converted to pyruvate / glucose → lactic acid + energy / {anaerobic respiration / lactate}causes blood pH to drop / less anaerobic respiration gives less lactate

4

- stroke volume increases more in athlete due to {(more / stronger) {heart / cardiac} muscle present/ greater ventricular contraction force/ increased contraction of cardiac muscle} /converse
- (increase in stroke volume) supplying more (oxygen / glucose) to respiring cells

5

- athletes have larger lung capacity {for oxygen exchange due to training/ more effective gas exchange /to respire aerobically for longer} / converse.
- endurance athletes have more {slow twitch muscles /stores of myoglobin / mitochondria} / sprinters will have more fast twitch muscle fibres / non athlete have {greater proportion of / less} fast twitch muscles in their musculature / accept a correct comment about slow / fast muscle fibres

6

- in non-athletes (because stroke volume doesn't increase) less oxygen being delivered to the respiring muscle cells than in athlete / accept converse
- non athletes develop larger oxygen debt than athletes (because lactate levels are higher)
- drop in blood pH detected by chemoreceptors which start chain of events leading to increase in {ventilation /breathing / heart} rate

7

- no {error bars / SDs } on stroke volume graph so cannot comment on the significant difference
- no details about {age / gender / health / diet} of athletes and non-athletes in investigation

(6)

			Additional guidance
Level 0	0	No awardable content	
Level 1	1-2	<p>An explanation may be attempted but with limited interpretation or analysis of the scientific information and with a focus on mainly just one piece of scientific information.</p> <p>The explanation will contain basic information, with some attempt made to link knowledge and understanding to the given context.</p>	<p>aspect = graph or athlete/non-athlete</p> <p>1 mark = description of one aspect (graph or person) 2 marks = description of both aspects or description of one with some explanation</p>
Level 2	3-4	<p>An explanation will be given, with occasional evidence of analysis, interpretation and/or evaluation of both pieces of scientific information.</p> <p>The explanation shows some linkages and lines of scientific reasoning, with some structure.</p>	<p>3 marks = description of both aspects with some explanation for one 4 marks = description of both aspects with explanation</p>
Level 3	5-6	<p>An explanation is made that is supported throughout by sustained application of relevant evidence of analysis, interpretation and/or evaluation of both pieces of scientific information.</p> <p>The explanation shows a well-developed and sustained line of scientific reasoning, which is clear and logically structured.</p>	<p>All level 2 content plus: consideration of why there is a difference in stroke volume between athlete/non-athlete and why the lactate increases are different between athlete/non-athlete</p>



# Examiners report

Candidates are provided with data on lactate concentration as the intensity of exercise increases and the stroke volume changing with heart rate. The data and graph compares an athlete and non athlete. Candidates are tasked with explaining the results of the investigation using the data provided and their own subject knowledge.

It is pleasing to see that candidates are at last coming to terms with the expectations of a level based question. Those who merely described the data from the graph or table were limited to level 1. To get to level 2 some degree of explanations is required, albeit simplistic, in biological detail. However the detail has to be accurate. Level 3 is where there is detailed biology used.

Explain the results of this investigation.

Use the information in the graph and the table and your own knowledge to support your answer.

(6)

The <sup>difference</sup> ~~change~~ in lactate conc in blood is very apparent between athletes and non athletes even at 0 intensity (1.0 for athlete & 1.5 for non athlete). However it only seems to get more and more drastically different from start to end of experiment as GO = 1.1 for A while 2.3 for B then jumped to 3.2 A and 6.2 B at 180 intensity. This shows that the difference is <sup>by</sup> more than half. Furthermore the graph provided additional info: Stroke volume seems to be related to lactate conc. The athlete has an increase in stroke vol while the non athlete has a stable stroke volume. The heart rate didn't affect non athlete like athlete. This is likely due to <sup>increase</sup> ~~rate~~ of lactate production / conc.





This candidate has described graph and table with no real explanation.  
Level 1



# Support

# Support for you at every stage

Free Resources and support	Planning, teaching and learning	Exam preparation and assessment	Results support
Getting Started Guide	✓		
Training Events (Face-to-Face & Online)	✓		
Subject Advisor Support	✓	✓	✓
Community Forums	✓	✓	✓
Schemes of Work	✓		
Skills Mapping	✓		
Sample Assessment Materials	✓	✓	
Examiner Reports	✓	✓	✓
Exemplar Marked Responses		✓	
Past Papers		✓	
examWizard		✓	
Mark Schemes		✓	
ResultsPlus Mock Exam Analysis		✓	
Results Plus		✓	✓
Access to Scripts Service (ATS)			✓

# Teaching and Learning Materials online

## Course materials

**FILTERS**

**CATEGORIES**

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**Specification and sample assessments (4)**

**Specification**

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Specification Course materials News

Our qualifications > International Advanced Levels > Biology (2018)

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**International Advanced Levels Biology (2018)**

**Specification**

First teaching: **September 2018**  
First external assessment: **2019**

Our International Advanced Subsidiary and Advanced Level Biology has been developed to be engaging for international learners and to give them the necessary skills to support progression to higher education or further study in biology, as well as to a wide range of other subjects.

**DOWNLOAD**

PDF | 1.6 MB

**Register your interest**

Find out more about Pearson Edexcel International qualifications and sign up to receive the latest news.

[Let us know](#)

**Course materials**

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- [Exam materials \(242\)](#)
- [Teaching and learning materials \(44\)](#)

**Teaching support and training**

- [Training sessions](#)
- [Results support](#)
- [Grade boundaries](#)

**Published resources**

To support effective classroom delivery, we've developed a range of published resources for the new Edexcel International Advanced Level (IAL), with a strong focus on progression, recognition and transferable skills – allowing learning in a local context to a global standard.

[Learn more](#)

**Useful documents**

- [International Advanced Level Science Subject guide \(PDF | 1.1 MB\)](#)
- [Science support overview \(PDF | 521.1 KB\)](#)

**News and updates**

[See more](#)

March 2024 Teaching Science update | **6 March 2024**

February 2024 Teaching Science update | **7 February 2024**

January 2024 Teaching Science update | **19 January 2024**

# Support for Exam preparation and post results



- Free online results analysis tool for teachers.
- Provides a detailed breakdown of student performance in Pearson Edexcel exams.
- Identify topics and questions where the student could benefit from further learning and inform teaching strategies and approaches.
- Benchmark your school's performance against other Pearson Edexcel schools in your country.
- Not just a post-results tool: Mock exam results can also be fed into the system to produce analysis.
- Find student results analysis from their previous Pearson Edexcel school.
- ResultsPlus Direct gives your students access to their final grades and performance breakdown, wherever they are.
- Schools can sign up for free ResultsPlus account in just a few quick and easy steps:  
<https://qualifications.pearson.com/en/support/Services/ResultsPlus.html>

# ResultsPlus



**1.**  
Student  
takes exam  
on paper



**2.**  
Exam papers  
scanned



**3.**  
Examiners  
mark papers  
online



**4.**  
Performance  
reports  
shared



- A free tool for teachers which helps you make quick homework assignments, topic tests and mock exams.
- Questions tagged against unit, topic and assessment objective or simply choose a whole past paper.
- Use existing mark schemes for accurate marking.
- Use examiner report for insight.
- Most recent exam content available sooner.
- Use the results to understand where students need more support, informing teaching strategies.

# Access to Script (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.

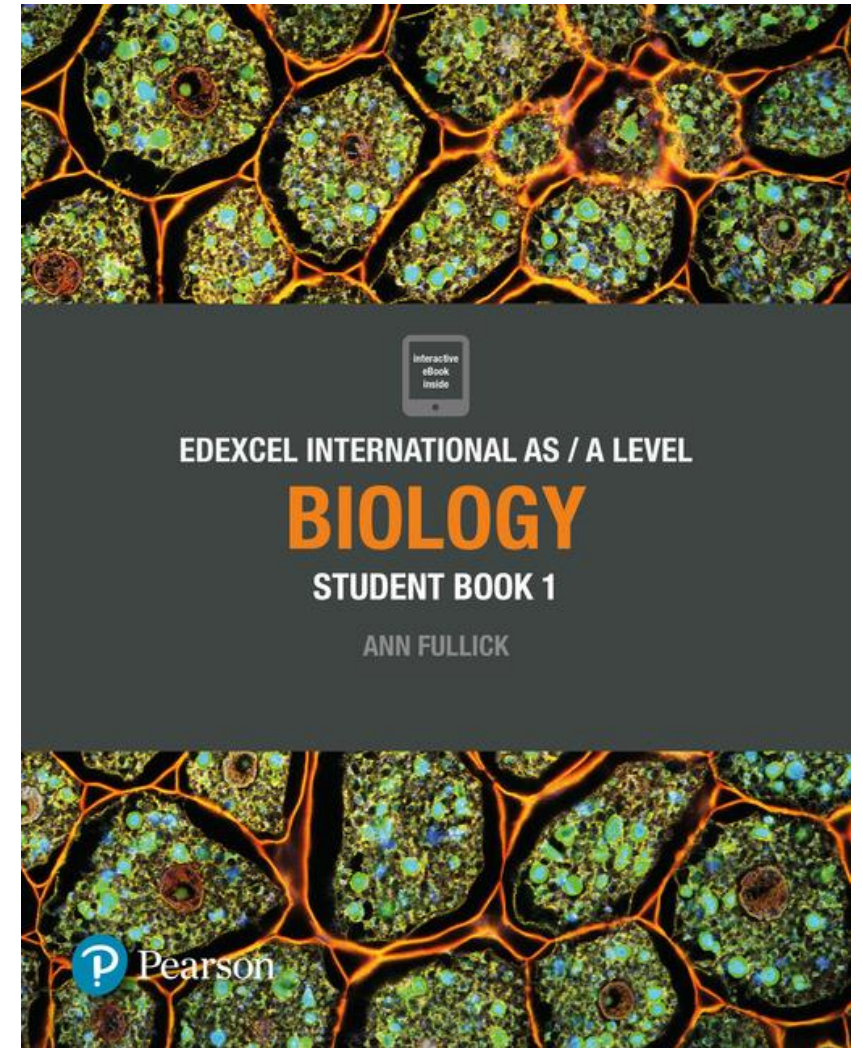
For more information on ATS, and the post results windows, visit our post-results pages.





# Pearson Publishing

- Supports a modular approach
- Exam practice
- Appropriate international content puts learning in a real-world context
- Embedded transferable skills
- Reviewed by a language specialist



# Contact your dedicated Subject Advisor

Tim Lawrence

Telephone: +44 (0) 344 463 2535

[qualifications.pearson.com/contactus](https://qualifications.pearson.com/contactus)

Email: [teachingspsychology@pearson.com](mailto:teachingspsychology@pearson.com)



# Questions



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