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INTERNATIONAL ADVANCED LEVEL

BIOLOGY

GETTING STARTED GUIDE

Pearson Edexcel International Advanced Subsidiary in Biology (XBI11)
Pearson Edexcel International Advanced Level in Biology (YBI11)
First teaching September 2018
First examination from January 2019
First certification from August 2019 (International Advanced Subsidiary) and August 2020 (International Advanced Level)

Pearson

INTERNATIONAL ADVANCED LEVEL BIOLOGY 2018
GETTING STARTED GUIDE FOR TEACHERS

Contents

Introduction

This Getting Started Guide provides an overview of the new Pearson Edexcel International A level in Biology (2018), to provide information about the content and assessment, and to give you a better understanding of what these mean for you and your students.

Support for delivering the new specification

Our package of support to help you plan and implement the new specification includes:

Planning – In addition to this Guide, we will provide a course planner and an editable scheme of work that you can adapt to suit your department.

Teaching and learning – To support you in delivering the new specification, we will provide Guides for Practical Skills and for Mathematical Skills, for you and for your students. In addition, we are planning Topic Guides, to give further background information to support your teaching of certain aspects of the specification.

Understanding the standard – A full set of sample assessment materials is provided.

Tracking learner progress – Results Plus provides the most detailed analysis available of your students' exam performance. It can help you identify topics and skills where students could benefit from further learning. We will also offer examWizard, which is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiner reports for a range of International A level subjects.

Support – Our Subject Advisor service will ensure you receive help and guidance from us as well as enabling you to share ideas and information with each other. You can sign up to receive e-newsletters to keep up to date with qualification updates, product and service news.
You can email our Subject Advisor at: TeachingScience@pearson.com

Key features of the qualification

- The specification content has been designed to be similar to that of the existing International A level. However, some changes have been made to the content. These changes are mostly influenced by changes made in the new GCE A level (2015) specifications used by schools in the UK. In particular, the IAL specification combines elements of both the Biology A and Biology B specifications used in the GCE A level.

- The assessment model has six question papers (Units) in total: Units 1 – 3 make up the International AS level and Units 4 – 6 make up the International A2 level. Students who complete all six Units are eligible for the full International A level award.

- The specification is modular. Students can sit Units in any of the examination series in which they are offered and cash-in for the qualification when they have completed the required number of Units. Each Unit is designed to cover a particular area of specification content, although some Units may also draw on knowledge from other areas of the specification.

- All Units will have a range of question styles, including calculations for which calculators may be used.

- Practical skills will be assessed in two units: Unit 3 at IAS and Unit 6 at IAL. There is no coursework or practical exam.

- Students will develop analytical and logic skills by applying understanding of scientific concepts and principles to a range of situations. Some examination questions will be more problem solving in style; and may also address the need for mathematical skills to complement students' knowledge.

- We have designed our International A level qualification to be of equivalent standard to the GCE A level (2015) in Biology used by schools in the UK. This ensures that International A levels are recognised globally and provide students with the same progression routes.

- The specification content also gives you the opportunity to consider key Transferrable Skills whilst teaching the subject. These skills are key for students to progress to Higher Education or the workplace.

Qualification overview

This section provides an overview of the course to help you see what you will need to teach. The overview gives a general summary of each of the Unit examinations.

Unit 1: Molecules, Diet, Transport and Health	**Unit code: WBI11/01**
• Externally assessed • 1 hour 30 minutes, 80 marks • Availability: January, June & October • First assessment: January 2019	40% of the total IAS 20% of the total IAL
Content summary • Molecules, Transport and Health • Membranes, Proteins, DNA and Gene Expression	
Assessment • This paper may include multiple-choice, short-open, open-response, calculations and extended-writing questions. • This paper will include a minimum of 8 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding to familiar and unfamiliar contexts.	

Unit 2: Cells, Development, Biodiversity and Conservation	Unit code: WBI12/01
• Externally assessed • 1 hour 30 minutes, 80 marks • Availability: January, June & October • First assessment: June 2019	40% of the total IAS 20% of the total IAL
Content summary • Cell Structure, Reproduction and Development • Plant Structure and Function, Biodiversity and Conservation	
Assessment • This paper may include multiple-choice, short-open, open-response, calculations and extended-writing questions. • This paper will include a minimum of 8 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding to familiar and unfamiliar contexts.	

Unit 3: Practical Skills in Biology I	Unit code: WBI13/01
• Externally assessed • 1 hour 20 minutes, 50 marks • Availability: January, June & October • First assessment: June 2019	20% of the total IAS 10% of the total IAL
Content summary This unit will assess students' knowledge and understanding of experimental procedures and techniques that were developed in Units 1 and 2.	
Assessment • This paper may include short-open, open-response and calculation questions. • This paper will include a minimum of 5 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding of practical skills to familiar and unfamiliar situations.	

Unit 4: Energy, Environment, Microbiology and Immunity	Unit code: WBI14/01
• Externally assessed • 1 hour 45 minutes, 90 marks • Availability: January, June & October • First assessment: January 2020	40% of the total IA2 20% of the total IAL
Content summary • Energy Flow, Ecosystems and the Environment • Microbiology, Immunity and Forensics	
Assessment • This paper may include multiple-choice, short-open, open-response, calculations and extended-writing questions. • This paper will include a minimum of 9 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding to familiar and unfamiliar contexts. • This paper may contain some synoptic questions which require knowledge and understanding from Unit 1 and 2.	

Unit 5: Respiration, Internal Environment, Coordination and Gene Technology	Unit code: WBI15/01
• Externally assessed • 1 hour 45 minutes, 90 marks • Availability: January, June & October • First assessment: June 2020	40% of the total IA2 20% of the total IAL
Content summary • Respiration, Muscles and the Internal Environment • Coordination, Response and Gene Technology	
Assessment • This paper may include multiple-choice, short-open, open-response, calculations and extended-writing questions. • Pre-released reading (scientific article) will be provided for this assessment. • This paper will include a minimum of 9 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding to familiar and unfamiliar contexts. • This paper may contain some synoptic questions which require knowledge and understanding from Unit 1, 2and 4.	

Unit 6: Practical Skills in Biology II	Unit code: WBI16/01
• Externally assessed • 1 hour 20 minutes, 50 marks • Availability: January, June & October • First assessment: June 2020	20% of the total IAS 10% of the total IAL
Content summary This unit will assess students' knowledge and understanding of experimental procedures and techniques that were developed in Units 1, 2, 4 and 5.	
Assessment • This paper may include short-open, open-response and calculation questions. • This paper will include a minimum of 5 marks that target mathematics at Level 2 or above (see *Appendix 6: Mathematical skills and exemplifications*). • Students will be expected to apply their knowledge and understanding of practical skills to familiar and unfamiliar situations.	

Assessment Objectives

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

A more detailed breakdown showing the proportion of each Assessment Objective in each Unit can be found in the specification.

Unit availability

The assessment for this qualification is modular and Units may be sat in any examination series in which they are offered.

The revised specification is designed for first teaching in September 2018 and units will be available for assessment from January 2019. The units will be introduced so that AS units will be offered first, then A2 units once students start the second year of the IAL after September 2019.

At the same time, units from the existing specification will be phased out. **Please note that units from the existing specification and the new specification cannot be combined together**.
Please note carefully, which units will be offered in which exam session, and when the qualification can be cashed-in for a grade.
Additional information is published on the IAL 2018 website here.

	June 2018	October 2018	January 2019	June 2019	October 2019	January 2020	June 2020	October 2020
IAL (2013) – legacy								
WBI01	✓	✓	✓	✓	×	×	×	×
WBI02	✓	✓	✓	✓	×	×	×	×
WBI03	✓	✓	✓	✓	×	×	×	×
WBI04	✓	✓	✓	✓	✓	×	✓	×
WBI05	✓	✓	✓	✓	✓	×	✓	×
WBI06	✓	✓	✓	✓	✓	×	✓	×
AS CASH-IN	✓	✓	✓	✓	×	×	×	×
IAL CASH-IN	✓	✓	✓	✓	✓	×	✓	×
IAL (2018) – new								
WBI11	×	×	✓	✓	✓	✓	✓	✓
WBI12	×	×	×	✓	✓	✓	✓	✓
WBI13	×	×	×	✓	✓	✓	✓	✓
WBI14	×	×	×	×	×	✓	✓	✓
WBI15	×	×	×	×	×	×	✓	✓
WBI16	×	×	×	×	×	×	✓	✓
AS CASH-IN	×	×	×	✓	✓	✓	✓	✓
IAL CASH-IN	×	×	×	×	×	×	✓	✓

Assessment guidance

Changes to assessment

Some changes have been made to the Unit exam papers for the new IAL specification.

- Exam papers for AS Unit 1 and 2 will be 1h 30 minutes and contain 80 marks
- Exam papers for A2 Units 4 and 5 will be 1h 45 minutes and contain 90 marks
- Exam papers for AS Unit 3 and A2 Unit 6 will be 1h 20 minutes and contain 50 marks

- Exam papers will contain a proportion of marks which assess mathematical skills. This will be a total of 10% of marks across the suite of Biology examinations.

- At least one question on Units 1, 2, 4 and 5 will be an extended-response question worth 6 marks. These questions will assess biological knowledge and understanding, but also the ability to structure an answer in a logical and reasoned order. These questions will use a levels-based mark scheme.

Features of our question papers

Each Unit contains a variety of question types, including multiple- choice questions and extended-writing questions.

Unit 5 will have a question (split into parts, and worth around 20 marks in total) which is based on a pre-release article. The article will be released, via the IAL website, at least 6 weeks before the Unit 5 examination.

In each Unit, some of the question contexts will be unfamiliar to students; these questions are designed to assess the ability to apply scientific principles to unfamiliar situations, as well as data-handling skills.

Units 3 and 6 will assess practical and experimental skills which students have developed during the course. Questions on these units will consist of a range of questions, mostly short-answer but with at least one open-response question per paper. Students may be required to perform calculations, draw graphs and describe, explain and interpret experimental methods and observations.

Command words

All our examination papers in Science subjects – across the three sciences and across both our home and international specifications – use a consistent set of command words in examination questions.

The use of a particular command word gives candidates an indication of the nature of answer that is expected. For example, a question using "Describe…" is asking for a series of factual statements to be presented in order; but a question using "Explain…" is asking for any points made to be justified, or reasons given for their inclusion.

Mark schemes are developed with the command word in mind so that, to score full credit, a student must address the demand of the question. Some students find this hard, and may take a "scatter gun" approach, simply focusing on a key word in the question and writing all they know about that topic.

Students are advised to look closely at the command word before answering. For example, a student who answers an "Explain…" question by giving a number of factual statements without reasoning or justification (i.e. gives a description) is likely to score few marks.

Assessment of practical skills

Throughout the IAL Biology course, students should be completing a series of practical activities. These activities are likely to correspond to the Core Practicals or additional suggested practicals included in the specification content, but further activities may also be selected by the teacher. Hands-on experience of practical work may be supplemented with teacher demonstrations or by using videos.

When considering how to deliver practical activities, teachers should be aware that the inclusion of practical work in the IAL specification is not intended to simply involve factual recall of practical methods. Instead, students should be using practical activities to develop competency in a range of biological techniques across a variety of experimental situations.

Manipulative practical skills cannot easily be assessed through written questions on Unit 3 and Unit 6 examinations. Therefore, questions on these papers are likely to assess understanding of techniques, as well as aspects of planning and the evaluation of data and methods.

Students with a familiarity of practical scenarios, gained from consistent practical work throughout the IAL course, are much more likely to be successful in answering questions in Unit 3 and Unit 6. This is especially the case because a number of questions will be set in the context of unfamiliar practical situations, where students will need to apply their experience of practical work in order to answer.

Questions in Units 3 and 6 will focus on the key practical activities included in the specification content, but may require students to apply what they have learned to new practical situations. Although Units 3 and 6 form the key focus for questions on practical activities, teachers and students should be aware that some questions may appear on Units 1, 2, 4 and 5 that are in a practical context. These questions should focus on theoretical biological knowledge that derives from practical activities e.g. a question on a Unit 1 paper may require students to recall the result of a Benedict's test for a reducing sugar.

Assessment of mathematical skills

The use of relevant mathematical techniques is an integral part of any student of the Science subjects.

As part of IAL Biology, students will encounter a number of different mathematical skills. These may include simple calculations, re-arranging equations, using standard form, interpreting statistics, plotting and interpreting graphs, and considering significant figures.

Questions on examination papers have always tested the ability of students to use relevant mathematical skills. Although this does not change with the new IAL specification, there will be a greater consistency about the assessment of mathematical skills in the new examination papers.

This means two things: firstly that examination papers will assess a defined range of mathematical skills (these can be found in an Appendix in the specification), and secondly that the proportion of marks assessing mathematical skills will be more consistent from series to series. For Biology, this means approximately 10% of marks on each Unit examination paper will assess mathematical skills.

Course planner

This course planner is designed to give an overview of how the topics making up IAL Biology can be delivered over a two-year period.

You will find a more detailed lesson plan in the Scheme of Work document on the IAL Biology page of the Pearson Qualifications website. This gives more detailed information on a week-by-week basis, giving suggestions of the teaching times for each unit. This is editable so that you can customise it to meet your own needs.

An overview of a two-year course planner might be as follows.

Note that, in common with GCE A level qualifications, there is a recommendation that the total Guided Learning Hours for the whole IAL is 360 hours.

Year 1	
Week number	**Examined content**
1 - 7	Unit 1, Topic 1: Molecules, transport and health
8 - 14	Unit 1, Topic 2: Membranes, proteins, DNA and gene expression
15	Revision / Examination series
16 - 22	Unit 2, Topic 3: Cell structure, reproduction and development
23 - 29	Unit 2, Topic 4: Plant structure and function, biodiversity and conservation
30 - 31	Revision and AS exams
32 - 34	Unit 4, Topic 5: Energy flow, ecosystems and the environment (start)
Year 2	
1 - 4	Unit 4, Topic 5: Energy flow, ecosystems and the environment (continued)
5 - 12	Unit 4, Topic 6: Microbiology, immunity and forensics
13 - 14	Revision / Examination series
15 - 21	Unit 5, Topic 7: Respiration, muscles and the internal environment
22 - 28	Unit 5, Topic 8: Coordination, response and gene technology
29 - 33	Revision and A2 exams

Delivery of the qualification

Transferable skills

Why transferable skills?

Ensuring that our International A level qualifications will help improve student outcomes through the acquisition of transferable skills, as well as subject content and skills, is a key aim for Pearson.

In recent years, Higher Education Institutions and employers have flagged the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

Through our teaching materials and support offered we want to:

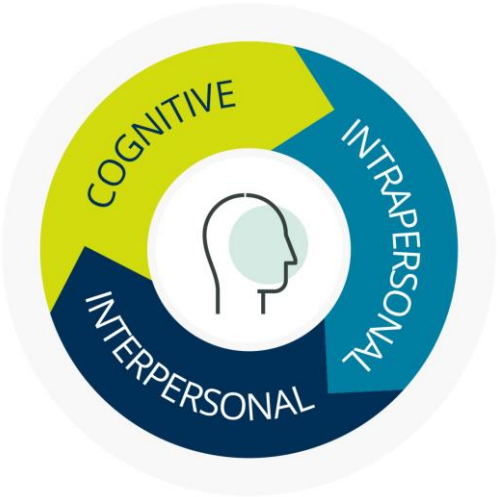
1. increase awareness, for both students and teachers, of transferable skills that are already being assessed,
2. indicate where, for teachers, there are opportunities to teach additional skills that will not be formally assessed, but that would be of benefit to students.

What are transferable skills?

The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as 'the bundle of knowledge, attributes and capacities that can be learned and enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning.'[1]

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, we identified the National Research Council's (NRC) framework [2] as the most evidence-based and robust skills framework, and have used this as a basis for our adapted skills framework.

The framework includes cognitive, intrapersonal skills and interpersonal skills.



The skills have been interpreted for this specification to ensure they are appropriate for the subject. All of the skills listed are evident or accessible in the teaching, learning and/or assessment of the qualifications. Some skills are directly assessed. Pearson materials will support you in identifying these skills and developing these skills in students.

The table below sets out the framework and gives an indication of the skills that can be found in Biology and indicates the interpretation of the skill in this area. A full subject interpretation of each skill, with mapping to show opportunities for student development is given on the subject pages of our website.

COGNITIVE SKILLS	**Cognitive processes and strategies**	• Critical thinking • Problem solving • Analysis • Reasoning / argumentation	• Interpretation • Decision making • Adaptive learning • Executive function
	Creativity	• Creativity	• Innovation
INTRAPERSONAL SKILLS	**Intellectual openness**	• Adaptability • Personal & social responsibility	• Continuous learning • Intellectual interest and curiosity
	Work ethic/ conscientiousness	• Initiative • Self-direction • Responsibility • Perseverance • Productivity	• Self-regulation (metacognition, forethought, reflection) • Ethics • Integrity
	Positive core self-evaluation	• Self-monitoring / self-evaluation / self-reinforcement	
INTERPERSONAL SKILLS	**Teamwork and collaboration**	• Communication • Collaboration • Teamwork	• Cooperation • Empathy / perspective taking • Negotiation
	Leadership	• Responsibility • Assertive communication	• Self-presentation

[1] (OECD (2012), Better Skills, Better Jobs, Better Lives (2012):http://skills.oecd.org/documents/OECDSkillsStrategyFINALENG.pdf)

[2] Koenig, J. A. (2011) Assessing 21st Century Skills: Summary of a Workshop, National Research Council)

Suggested resources

It is difficult to give a complete list of all resources that will be relevant for IAL Biology, as this will change over time. Also, a number of potential resources which are available online may not be available in all countries.

Teachers are therefore recommended to check the IAL Biology (2018) page on the Pearson Qualifications website on a regular basis.

Name of resource	Link and information
Dedicated Science Subject Advisor	Email: TeachingScience@pearson.com Telephone UK: +44 (0)20 7010 2190 Twitter: @PearsonSciences Our Subject Advisor team is here to help with any questions about the content or delivery of any of our Science qualifications. The Subject Advisor team can also forward questions, using the Ask The Expert service, to our team of senior examiners.
examWizard	examWizard is a free online resource for teachers containing a huge bank of past paper questions and support materials to help you create your own mock exams and tests. http://qualifications.pearson.com/en/support/Services/examwizard.html
ResultsPlus	ResultsPlus is a free online results tool analysis for teachers that gives a detailed breakdown of your students' performance in Pearson Edexcel exams. https://qualifications.pearson.com/en/support/Services/ResultsPlus.html
Sample assessment material and specimen papers	A complete set of Sample Assessment Materials is available on the IAL Biology page of the Pearson Qualifications website. Past papers are also available on the equivalent IAL Biology (2013) page.
Guides for teachers	The "Course materials" tab of the IAL Biology page contains a number of guidance documents including a Getting Started Guide, Scheme of Work, Mapping Documents and Guides to Practical and Mathematical skills.
Textbooks	Details of published resources for the new IAL specifications can be found through the Pearson Global Schools website: www.pearsonglobalschools.com