

# Pearson Edexcel

## International GCSE in Human Biology (4HB1)

First teaching in September 2017

First assessment June 2019



# Session Agenda

- 08:00 Welcome & Introductions
- 08.10 International GCSE Features
- 08:15 Introduction to the Edexcel International GCSE in Human Biology
- 09:00 Preparing to teach; planning and delivery of 4HBI
- 09.20 Assessment structure
- 09.35 Resources and support
- 09.45 Final questions
- 10.00 Close

# Aims and Objectives

- To gain an overview of the specification structure and content
- Explore teaching and delivery strategies
- Understand the assessment structure and how to prepare students for examinations
- Identify the support available from Pearson

**Pearson Edexcel**

# About Pearson Edexcel

**Pearson is the world's leading learning company.** Our mission is to help people make progress in their lives through learning – because we believe that learning opens up opportunities, creating fulfilling careers and better lives.

- ❖ **Qualifications:** our qualifications and assessments help to educate millions of people worldwide.
- ❖ **Support:** we provide innovative textbooks, curriculum materials, multimedia learning tools, IT platforms, professional development.
- ❖ **Impact:** At the core of everything we do is the desire to make a measurable impact on improving people's lives through learning.

**Edexcel is part of Pearson Education and is the UK's largest awarding body.**

- ❖ **Worldwide recognition:** over 150 years of international education experience, more than 3.4 million learners in 70+ countries. Over 9 million scripts marked annually, with exceptionally reliable results.

# International GCSE Features



# 9-1 grading scale

|   | NEW GRADING STRUCTURE | CURRENT GRADING STRUCTURE |
|---|-----------------------|---------------------------|
| <p>The new <b>grade 9</b> represents a new level of attainment and has been introduced to differentiate your top performing students.</p> <p>The bottom of the <b>grade 7</b> broadly aligns with the bottom of the grade A.</p>    | 9                     | A*                        |
|   | 8                     |                           |
|   | 7                     | A                         |
| <p>There's greater differentiation in the middle of the scale, with <b>three new grades 6, 5 and 4</b> rather than two grades (B and C).</p> <p>The bottom of the <b>grade 4</b> broadly aligns with the bottom of the grade C.</p> | 6                     | B                         |
|   | 5                     |                           |
|   | 4                     | C                         |
|   | 3                     | D                         |
| <p>The bottom of the <b>grade 1</b> broadly aligns with the bottom of the grade G.</p>  | 2                     | E                         |
|   | 1                     | F                         |
|   | 1                     | G                         |
|   | U                     | U                         |

# 9-1 grading scale

## Awarding

- The grading system has changed but our commitment to awarding grades that accurately reflect learner exam performance remains the same.
- We set new grade boundaries (minimum number of marks needed to achieve each grade) for each assessment of each qualification.

## Benefits

- Greater differentiation across levels of attainment, e.g. 2 grades where the current C grade is.
- Rewards truly outstanding achievement with the grade 9.
- Provides more information about student attainment to help progression to A Level.
- Same scale for Pearson Edexcel GCSE and International GCSE allows for clear comparison with English standards, unlike old A\* to G grading.



# World-class qualifications

All Edexcel qualifications are developed to meet Pearson's World Class Qualification design principles



Endorsement of educational **thought-leaders and assessment experts** from across the globe

Developed using an understanding and benchmarking of **all educational systems**

Qualifications that support young people to **develop the capabilities** they need to **progress** and prosper in their lives

# Supporting Transferable skills

- Our transferable skills framework underpins the design all Pearson Edexcel international qualifications and their supporting resources across IPLS, International GCSE and International A Level.
- Ensures our assessments target the skills students' need for successful progression.
- Increasing our support where these skills **naturally** occur through the teaching, learning and assessment.
- Pearson materials and mapping will support you in identifying and developing the acquisition of these skills in students across the full curriculum.
- <https://qualifications.pearson.com/content/dam/pdf/International%20GCSE/General/Transferable-Skills-Information-Pack.pdf>



# Introduction to the International GCSE in Human Biology

**Activity 1**  
**POLLS to get  
to know you**

# Specification content

- Twelve units include relevant, engaging and up to date science to allow study in a broad range of topics related to Human Biology
- Content has been modified taking into account feedback from the International and UK school subject community including a large number of teachers
- Allows smooth transition from Level 2 to Level 3 qualifications in compatible subjects and provides more in-depth information in Human Biology for students aspiring to professions such as medicine
- The topics covered allow students develop a variety of skills including practical, analytical, problem solving, mathematical and critical thinking

Changes to the qualification are highlighted in red in the downloadable Getting Started guide

<https://qualifications.pearson.com>

## 1) Cells and tissues

| New Human Biology (2017) specification   | Current Human Biology (2009) specification/<br>note on change |
|--|---|
| 1.1 recognise cell structures as seen with a light microscope and electron microscope ( <b>TEM images only</b> ), including nucleus, <b>chromosomes</b> , cell membrane, mitochondria, endoplasmic reticulum and ribosomes   | 1a  |
| 1.2 describe the functions of the cell structures:<br><ul style="list-style-type: none"> <li>■ nucleus</li> <li>■ <b>chromosomes</b></li> <li>■ cell membrane</li> <li>■ mitochondria</li> <li>■ endoplasmic reticulum</li> <li>■ ribosomes.</li> </ul>  | 1a  |
| 1.3 describe the structure of a DNA molecule as:<br><ul style="list-style-type: none"> <li>■ two strands coiled to form a double helix</li> <li>■ <b>containing nucleotides</b></li> <li>■ <b>strands linked by complementary bases</b></li> <li>■ <b>complementary bases linked by hydrogen bonds.</b></li> </ul>               | 1b  |
| 1.4 describe DNA replication as the separation of DNA strands and the formation of a new strand by complementary base pairing of nucleotides, including the role of DNA polymerase   | This is new   |
| 1.5 understand that a gene is a length of DNA containing a sequence of bases that code for a specific protein. Teaching should be limited to:<br><ul style="list-style-type: none"> <li>■ the order of bases in DNA codes for the order of amino acids in a protein</li> <li>■ 3 bases coding for one amino acid.</li> </ul>     | This is new   |
| 1.6 know that RNA is a second type of nucleic acid that has the following features:<br><ul style="list-style-type: none"> <li>■ single stranded</li> <li>■ contains ribose</li> <li>■ contains uracil and that it is used to take information from DNA in the nucleus to the ribosomes for the synthesis of proteins.</li> </ul> | This is new   |
| 1.7 understand that a DNA mutation involves a change in the sequence of bases that could lead to a change in the amino acid sequence and phenotype of an individual.   | This is new   |

# Human Biology content

| Topic   | Number of Practicals |
|---|----------------------|
| 1. Cells and tissues                            |                      |
| 2. Biological molecules                         |                      |
| 3. Movement of substances into and out of cells |                      |
| 4. Bones, muscles and joints                    |                      |
| 5. Coordination                                 |                      |
| 6. Nutrition and energy                         |                      |
| 7. Respiration                                  |                      |
| 8. Gas exchange                                 |                      |
| 9. Internal transport                           |                      |
| 10. Homeostatic mechanisms                      |                      |
| 11. Reproduction and heredity                   |                      |
| 12. Disease                                     |                      |

## Activity 2

Identify where compulsory practical activities are embedded in each of these topics.

Write down how many are in each topic on your sheet in the Delegate booklet



# Practical Activities

- 10 'compulsory' practical activities
- Can be carried out (preferably) by the student or as a demonstration. They can also be accessed through online or other resources
- There are also a further seven suggested practical investigations which are not compulsory but that could be tested in formal examinations.
- Details of all compulsory and suggested practicals are in your delegate handbook

**Assessment of practical skills will account for between 19-21% of marks in the Human Biology examination papers**



# Activity 3

## Suggested practicals

- Look through the topic pages of the specification found in your delegate pack
- Complete the suggested practicals table in your pack by assigning each suggested practical to one or more sub-topics
- Add the specification reference number and the topic title to the table

| Practical  | Spec ref. | Topic title |
|--|-----------|-------------|
| Investigate cells from different tissues using light microscopy and observe electron micrographs of cells as listed in 1.1 |           |             |
| Investigate the stages of mitosis using microscopy   |           |             |
| Investigate the nutrient content of food limited to starch, protein, glucose and lipids                                    |           |             |
| Investigate diffusion and osmosis using living and non-living systems  |           |             |
| Investigate the speed of a nerve impulse   |           |             |
| Investigate the effect of light intensity on the eye   |           |             |
| Investigate the effect of antibiotics on bacteria  |           |             |

# Suggested Practicals

| Practical  | Spec ref.             | Topic title  |
|--|-----------------------|--|
| Investigate cells from different tissues using light microscopy and observe electron micrographs of cells as listed in 1.1 | 1.1                   | Recognise cells structures as seen with a light microscope and electron microscope                             |
| Investigate the stages of mitosis using microscopy   | 1.3, 1.10, 1.11, 11.2 | Understand that mitosis occurs during growth, repair, cloning and asexual reproduction (1.10/11)               |
| Investigate the nutrient content of food limited to starch, protein, glucose and lipids                                    | 2.3, 6.1, 6.3         | Describe the tests for glucose, starch, lipid and protein  |
| Investigate diffusion and osmosis using living and non-living systems  | 3.1, 3.2, 3.3         | Understand that movement of substances into and out of cells can be by diffusion, osmosis and active transport |
| Investigate the speed of a nerve impulse   | 5.1-5.6               | Describe the pathway taken by a nerve impulse to cause a response to a stimulus                                |
| Investigate the effect of light intensity on the eye   | 5.11                  | Explain the structure and function of the eye  |
| Investigate the effect of antibiotics on bacteria  | 12.6                  | Investigate the effects of antibacterial agents and antibiotics on the growth of bacterial culture             |

# Maths Content

There are five categories into which the mathematical component of the course can be placed:

- Arithmetic and numerical computation
- Handling data
- Algebra
- Graphs
- Geometry and trigonometry

**Assessment of maths skills will account for 10% of marks in the Human Biology examination papers**

# Example of Human Biology maths content

|          | HB   |
|----------|--|
| <b>1</b> | <b>Arithmetic and numerical computation</b>  |
| 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 ✓ |
| <b>2</b> | <b>Handling data</b>   |
| 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 ✓   |

# Activity 4

## Opportunities for teaching maths

- Please type your answers into chat for each of the following questions
- Read through Topics 11 (Reproduction and Heredity) and Topic 12 (Disease)
  1. *Give three maths skills that could be incorporated into the teaching of this topic*
  2. *How might an opportunity to teach maths skill 2E – understand the principles of sampling as applied to scientific data – arise in the delivery of Topic 11 – Reproduction and heredity?*

# Examples where maths could be included – Topic 12

| Specification reference | Maths skill(s)       |
|-------------------------|----------------------|
| 12.4                    | 1A-D, 2A-E/H/I, 4A/C |
| 12.5                    | 1A-C, 4A/C/D         |
| 12.6                    | 1A-D, 2A-H, 4A-C     |

For question 2 examples might be:

- Delivery of the lesson could include analysis/manipulation about the number of IVF patients that had successful pregnancies
- Data could be compared to conclude whether quality of life has improved in CF patients receiving gene therapy compared to patients not receiving gene therapy

# Preparing to teach: planning and delivery of the International GCSE in Human Biology

# Planning to teach

- Know the specification and where there are opportunities to teach sub-topics from different parts of the specification together
- For teachers with experience of teaching Human Biology understand the changes to the qualification
- Incorporate key skills (mathematical, practical, scientific literacy, extended writing, comprehension, etc.,) in your planning
- Ensure that all 'compulsory' practicals are accessible to students and consider incorporation of suggested practicals in schemes of work
- Think about the order in which you might teach the content

**There are some materials to support your planning available to download from this training session**



# Activity 5

## Understanding the specification

- There is some cross-over in subtopics in the specification that could be taught together
- Read through Topics 2 and 6 in the specification found in the delegates booklet

Type your responses to the following questions in the chat panel.

1. *How could some of the content of these topics be taught together?*
2. *Where is there opportunity to help develop skills in maths and extended writing (4 mark questions and above) in these topics?*

# Examples might include:

1. 2.1, 2.2 and 2.3 could be taught in conjunction with 6.1 – 6.4 and 2.10 could be combined with 6.7
2. Compulsory practicals 2.4 and 2.5 maths skills 1A-C, 2A-H, 4A-C and in 6.1 and 6.7 maths skills 1A-C, 2A-H and 4A/C
3. Describe the chemical breakdown of carbohydrates, protein and lipids in the digestive system.

## Two- year course planner

A two year course planner is available in the downloadable Getting Started Guide

| Week No. | Topic  | Lesson content               | Sub-topics covered   |
|----------|--|------------------------------|--|
| 1        | <b>Section 1<br/>Cells and Tissues<br/>12 hours</b>        | 1.1, 1.2                     | Cell structures and functions                                      |
| 2        |  | 1.3, 1.4                     | Structure of DNA and DNA replication                               |
| 3        |  | 1.5, 1.6, 1.7, 1.8           | Protein synthesis and mutations                                    |
| 4 (a)    |  | 1.9                          | Genetic engineering  |
| 4 (b)    |  | Consolidation and assessment | Cell structure<br>DNA replication and genetic engineering          |
| 5        |  | 1.10, 1.11, 1.12, 1.13       | Mitosis<br>Stem cells<br>Ethics                                    |
| 6        |  | 1.14, 1.15, 1.16             | Cells, tissues and organs<br>Bone and muscle<br>Specialised cells  |
| 7        | <b>Section 2<br/>Biological Molecules<br/>11 hours</b>     | 2.1, 2.2, 2.3                | Elements present<br>Structures of molecules<br>Tests for molecules |
| 8        |  | 2.4, 2.5                     | Embedded practicals  |
| 9        |  | 2.6, 2.7                     | Enzymes as catalysts<br>Factors affecting enzymes                  |
| 10       |  | 2.8                          | Embedded practical   |
| 11       |  | 2.9, 2.10                    | Immobilised enzymes + embedded practical                           |
| 12 (a)   |  | Consolidation and assessment | Enzymes  |
| 12 (b)   | <b>Section 3<br/>Movement of Substances<br/>3 hours</b>    | 3.1, 3.2                     | Definitions + osmosis  |
| 13       |  | 3.3                          | Factors affecting movement   |
| 14       | <b>Section 4<br/>Bones, Muscles and Joints<br/>4 hours</b> | 4.1, 4.2, 4.3                | Skeleton<br>Joints<br>Structure of synovial joint                  |
| 15       |  | 4.4, 4.5, 4.6                | Muscles<br>Dietary factors<br>Osteoporosis                         |

# Teaching Strategies

- Modelling strategies work particularly well with topics such as digestion or nucleic acid structure and are more likely to engage students
- The double helix structure of DNA can be easily visualised with the use of templates that students can use to construct their own model
- Students create mind-maps to review learning before progressing through a topic
- Use of past papers or the SAMs and examiner reports can help develop examination skills and expose students to unfamiliar content in questions e.g. graphical analysis
- Key and practical terminology could be reinforced with the use of crosswords, quizzes and word searches which students could devise themselves during independent study or incorporated into a lesson as a class activity

# Activity 6

## Teaching Strategies

- Think of a teaching strategy that you have used in one of your Human Biology lessons that:
  - Worked well
  - Didn't work well
- *Type a brief account of these strategies into the chat panel*
- If you are new to this qualification please give examples from other lessons that you have delivered

## At a glance: support for you at every stage

| FREE resources and support   | Planning, teaching & learning | Exam preparation and assessment | Results support |
|--|-------------------------------|---------------------------------|-----------------|
| Getting started guide  | ✓                             |                                 |                 |
| Training events (face-to-face and 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   |                               | ✓                               |                 |
| ResultsPlus  |                               | ✓                               | ✓               |
| Access to Scripts service (ATS)  |                               |                                 | ✓               |
| Additional online teacher materials  | ✓                             | ✓                               |                 |
| <b>Additional paid for resources available for Biology, Chemistry, Physics, Human Biology and Double Science</b> |                               |                                 |                 |
| Curriculum-matched Student Books with ActiveBooks  | ✓                             | ✓                               |                 |
| Online Teacher Resource Pack   | ✓                             | ✓                               |                 |

\*Available for selected subjects

# Assessment Structure

## Paper 1: Human Biology

1-hour 45-minute written examination

The total number of marks is 90,  
50% of the total International GCSE.

### Content summary

1. Cells and tissues
2. Biological molecules
3. Movement of substances in and out of cells
4. Bones, muscles and joints
5. Coordination
6. Nutrition and energy
7. Respiration
8. Gas exchange
9. Internal transport
10. Homeostatic mechanisms
11. Reproduction and heredity
12. Disease Assessment

## Paper 2: Human Biology

1-hour 45-minute written examination

The total number of marks is 90,  
50% of the total International GCSE.

### Content summary

Assessment may be on any area of content in the  
opposite box.



Linear assessment – 2 written papers at the end of the course

100% external assessment – no coursework

Single tier of entry

All components e.g. maths and practical skills tested to meet assessment objectives

Mixture of questions including comprehension and extended writing

# Question styles

- Each paper consists of a mixture of different question styles, including calculations, multiple choice, short answer, comprehension and extended open-response questions
- Both papers include similar question styles although Paper 2 includes a comprehension activity with questions based on the content of this
- The maximum number of each style of question is set to ensure a fair balance of all question styles, that will incorporate the use of a range of command words

In the assessment of practical skills students may be tested on their ability to:

|                                       |  |   |
|---------------------------------------|--|---|
| Solve problems                        | Apply scientific knowledge and understanding       | Devise and plan investigations                        |
| Evaluate data and methods             | Draw conclusions                                   | Analyse and interpret data                            |
| Communicate findings from experiments | Describe safe and appropriate practical techniques | Identify outliers and suggest improvements to methods |

## Assessment weightings

# A01

Knowledge and  
understanding of  
Human Biology

**40%**  
**(36 marks)**  
of total marks

# A02

Application of  
knowledge and  
understanding,  
analysis and  
evaluation of  
Human Biology

**40%**  
**(36 marks)**  
of total marks

# A03

Experimental skills,  
analysis and  
evaluation of data  
and methods in  
Human Biology

**20%**  
**(18 marks)**  
of total marks

# Preparing students for assessment

- Use the Examiner reports to highlight common misconceptions and other areas where students were challenged in previous examination series
- Familiarise students frequently with key terminology and practical terminology which will need to be used in their responses
- Make use of the SAMs that are found on the Pearson website and past papers that can be used alongside the grade boundary information
- Ensure that students have had adequate opportunity to access the compulsory practical's, are able to name, label and draw diagrams of simple scientific equipment

# More exam preparation

- Help prepare students in writing longer, prose answers which can carry a large number of marks. It may help initially to give students a markscheme and help to mark each others answers.
- Quick-fire recall tests and quizzes will help students to revisit prior learning and keep information fresh in their minds
- Development of revision flash cards as they work through the course provide a quick refresher that students can refer to help revise prior to tests and other forms of assessment

# Subject Features

**No coursework. 100% external assessment**

**Embedded practicals**

**Mathematical content updated in line with 9-1 requirements**

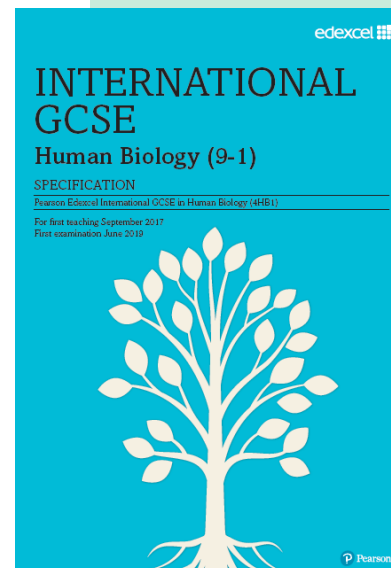
**Relevant, up-to-date, engaging content**

**Transferable Skills embedded**

**Written examinations accessible to students of all abilities**

**Dedicated textbooks and support material**

**[Teachingscience@pearson.com](https://www.teachingscience@pearson.com)**



# Resources

We offer a range of free and paid for resources for **International GCSE in Human Biology**. They have been designed to support teachers to improve learner outcomes.





# Support Overview for International GCSE in Human Biology

Getting Started Guide &  
Scheme of Work

Getting ready to Teach  
Events

Subject interpretation of  
transferable skills

Subject Advisor

Results Plus

Regional Support Manager

Curriculum Matched  
Publishing

Exemplar Marked  
Responses

Additional SAMs

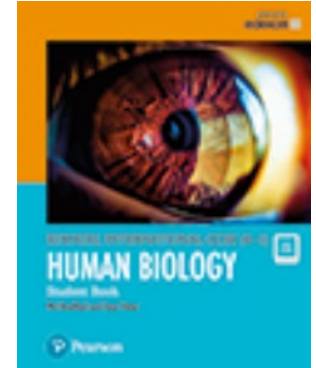
Exam Wizard

Lesson plans

Topic booklets

# Pearson Publishing

- Pearson Edexcel International GCSE (9–1) Human Biology Student Book and ActiveBook
- Pearson Edexcel International GCSE (9–1) Human Biology Online Teacher Resource Pack



- 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>

- 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.

# New 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 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:

- [pearson.com/internationalschools/blog](https://pearson.com/internationalschools/blog).



# Your Subject Advisor

Irine Muhiuddin

Twitter: [@PearsonSciences](#)

[Email or live chat](#)



You can sign up for Irine's e-updates by completing this [online form](#)

We also have an online [community](#) especially for Science teachers.

# 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.

## 3. [Progress to University](#)

Here you can find information and guidance about how to progress to universities worldwide with Pearson Edexcel qualifications.

## 4. [Access to scripts](#)

Make an informed enquiry about results (EARs) using our free access to scripts portal.



**Any questions?**

**Please fill in  
your evaluation forms**

**We value your feedback!**



ALWAYS LEARNING