Getting Ready to Teach Pearson Edexcel International GCSE (9-1) Human Biology (4HB1)

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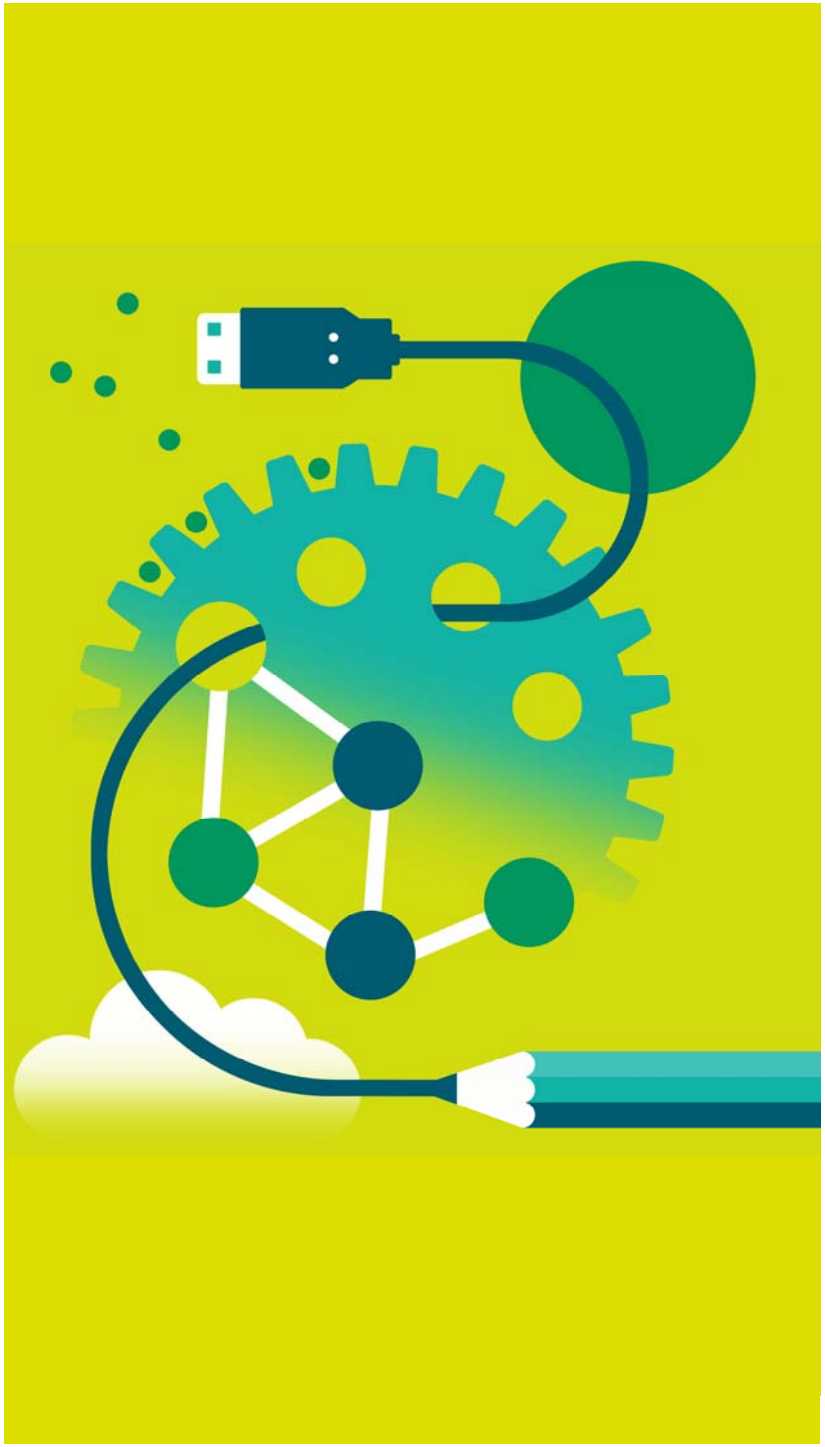


Your Online Environment

Aims and Objectives

During the event you will have the opportunity to learn about:

- the changes to the content
- structure and assessment of the revised International GCSE in Human Biology
- take an in-depth look at the sample assessment materials
- ask questions of our trainer
- learn about the new 9-1 grading scale
- learn about the free and published support for the qualification.

Agenda

0800-0830
Session 1 – overview of changes; detailed Human Biology changes

0830-0915
Session 2 – retained questions

0915 -0945
Session 3 – new questions; command words & terms, mathematical and practical skills

0945-0955
Session 4 – support and resources

0955-1000
Session 5 – questions?

POLLS TO GET TO KNOW YOU

Overview of new specification

International GCSE Human Biology

Content

- 12 units across human biology
- Includes modern developments e.g. genetics and molecular human biology

AOs / Skills Tested

- Knowledge and understanding of human biology
- Critical thinking, evaluation and comprehension
- Mathematical skills
- Experimental skills

Assessment

- Two papers of 1 ¾ hours (worth 50% each)
- 90 marks for each paper
- Mixture of question styles

Why are changes happening?

- Internationally benchmarked standards and curriculum
- Encourages deep learning by prioritising depth and cognitive demand
- Assessment tasks which seek to measure higher-order knowledge and skills

- Sets and maintains high standards over time
- Reliable and valid assessment tasks and processes that can withstand close scrutiny
- End-users (e.g. employers/ universities) can be confident of the knowledge, skills and competencies of certified students

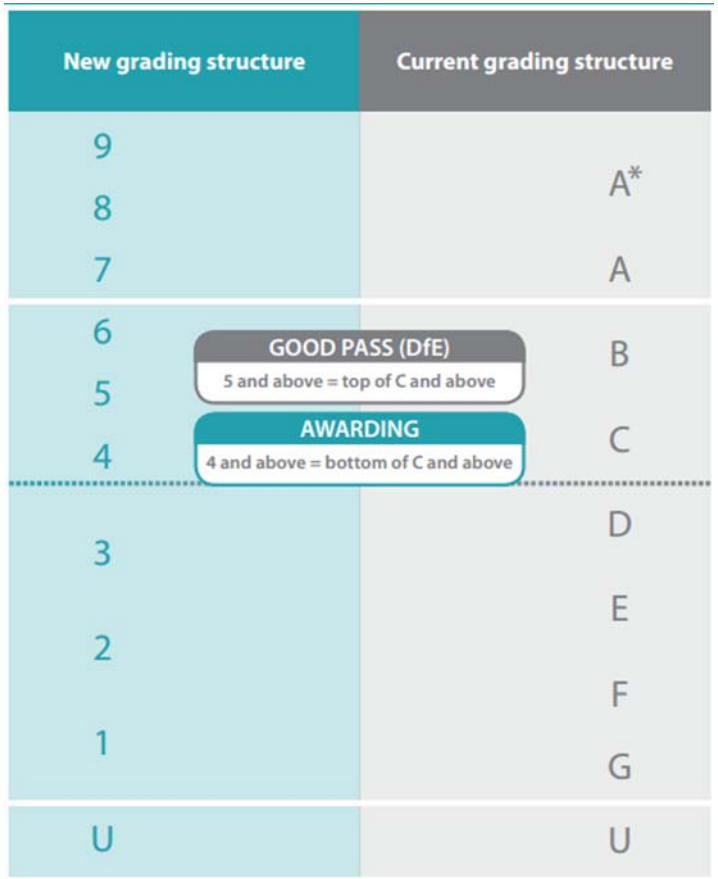
- Conceptualises learning as continuous
- Recognises that students progress at different rates and have different learning needs
- Provides detailed information on student achievement and a clear indication of progression possibilities

- Assures progression, provides access to a culture and promotes active citizenship
- Develops learner adaptability, initiative, resilience and metacognition
- Builds the capacity to work collaboratively and to lead

Additional student performance recognition at grade 9

The new 9-1 grading scale

- Broadly the same proportion of students will achieve a grade 4 and above as currently achieve a grade C and above
- Broadly the same proportion of students will achieve a grade 7 and above as currently achieve a grade A and above
- The bottom of grade 1 will be aligned with the bottom of grade G



Source:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/465873/your_qualification_our_regulation.pdf

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Grade 9

- Originally intended to be “the top 20% of those scoring Grade 7”

- However, this way of finding Grade 9 has been changed, as this method is not fair on students in subjects with skewed distributions

- New method of working out Grade 9 will be:

Proportion of Grade 7 students awarded Grade 9

= (% of students who achieved Grade 7 ÷ 2) + 7%

Grade 9 – an example

- An exam is sat by 12 000 students

- The grade boundaries are set – and 6 000 students achieve Grade 7 or higher

How many students get a Grade 9?

- 50% of the students have achieved a Grade 7

- So, (50 ÷ 2) + 7 = 32% **<u>of the Grade 7 students</u>** will get a Grade 9

- 32% of 6 000 students = 1 920 students achieving Grade 9

Dates for the new specifications

- New specifications are designed for first teaching in **September 2017**, with first exams in **May/June 2019**

- Many schools teach over 3 years, the specifications will be available to schools to teach from **September 2016**

- Final specifications, sample question papers and answers are now available on the website for Human Biology

Transition assessment dates

SEPTEMBER 2016	SEPTEMBER 2017	MAY / JUNE 2018	MAY / JUNE 2019
"LEGACY" Yr 10 / 4th Form continue with specifications	"LEGACY" Yr 11 / 5th Form continue with specifications	"LEGACY" Final summer exam series for specifications	"LEGACY" **NO FURTHER** EXAMINATION SERIES FOR SPECIFICATIONS
"NEW 9-1 spec" Centres taking 3 years will embark on specifications	"NEW 9-1 spec" All students* now being taught specifications * except students being taught over 1 year	**JANUARY 2019** **"LEGACY"** **Final resit series**	"NEW 9-1 spec" First exam series for specifications

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INTERNATIONAL GCSE HUMAN BIOLOGY

Specification content

Overview of changes in Human Biology

ADDITIONS TO THE SPECIFICATION

- DNA/RNA structure, protein synthesis, genetic modification and stem cells.
- Immobilised enzymes.
- Osteoporosis.
- Eye defects.
- Drugs, legal and illegal including the use of statins.
- Dementia in its various forms.
- Circulatory disorders.
- Gene therapy.

Overview of changes in Human Biology

REMOVALS FROM THE SPECIFICATION

- Recall that a mutation is rare, random change in genetic material that can be inherited.
- Recall that many mutations are harmful but some and neutral and a few are beneficial.
- Understand that mutant organisms can increase in a population by natural selection.
- Recall that the incidence of mutations can be increased by exposure to ionizing radiation etc.
- Sickle cell anaemia is no longer specifically mentioned in the spec .
- In section 12, polio, influenza, TB and thrush removed as specific named infection
- Schistosoma nutrition, life cycle, prevention of spread removed.
- The whole of Section 14 (Environment) has been removed

INTERNATIONAL GCSE HUMAN BIOLOGY

Assessment Model

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POLL #1

(i) Four cubes of equal size, from the same potato, are each placed into sugar solutions, A, B, C and D. Each sugar solution has a different concentration.

The cubes are weighed at the start and one hour after being placed in their sugar solution.

The table shows the results.

Solution	Mass at start in g	Mass after 1 hour in g
A	49.5	50.1
B	49.5	46.2
C	49.5	60.1
D	49.5	43.4

Which sugar solution has the lowest concentration?

(1)

- ☒ A
- ☒ B
- ☒ C
- ☒ D

POLL #2

3 (a) Ten students carry out an investigation to determine the speed at which a nerve impulse travels.

- they form a circle holding hands
- the first student starts a timer with his left hand
- using his right hand, he squeezes the left hand of the second student
- this continues until student number 10 has his left hand squeezed by student number 9
- student number 10 stops the timer with his right hand
- the distance the nerve impulse travels in each student is measured and the results recorded in the table.

Student number	1	2	3	4	5	6	7	8	9	10
Distance travelled by nerve impulse in each student in cm	198	220	175	189	207	190	167	168	176	210

(i) Suggest how the distance travelled by the nerve impulse in each student is measured.

(3)

Summary of assessment

FAMILIAR ...

AND NEW

100% external assessment – with no coursework

Linear assessment – all exams taken in the same exam session

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

Single tier of entry (untiered)

Each paper will have some longer questions . These have appeared in the current (legacy) paper 2 (4 – 6 marks)

Maths skills (10% in H Bio)

Comprehension type questions

More data analysis

Assessment objectives

AO1	AO2	AO3
Knowledge and understanding of Human Biology	Application of knowledge and understanding, analysis and evaluation of Human Biology	Experimental skills, analysis and evaluation of data and methods in Human Biology
40 % **(36 marks)** **of total marks**	**40 %** **(36 marks)** **of total marks**	**20 %** **(18 marks)** **of total marks**

Recall to Higher Order Thinking

Pure recall restricted to 15%:

14 marks in Paper 1
14 marks in Paper 2

Remember AO1 = 36 marks for Paper 1 and Paper 2

The consequence is fewer:

- Name the part labelled A….
- What is meant by the term…?
- Complete by writing suitable words on the dotted lines…

Assessment summary

Paper 1	**One hour and 45 minutes; 90 marks** includes **ALL** the specification statements
Paper 2	**One hour and 45 minutes; 90 marks** includes **ALL** the specification statements

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

The AO3 questions are likely to be in a practical context

Both papers have similar question types but Paper 2 will have a passage to read on which questions will be based

Command words

- All our qualifications in science now use a common taxonomy for command words

- These can be found in an appendix at the back of the specification

- Students can still expect a range of command words across the demand range of the exam paper

- Expect to see more questions that start with ‘explain’.

- Also expect to see occasionally a question that asks the candidate to ‘evaluate’.

Question Styles Retained

- CORMS

- Graph plotting e.g. Question 2 Paper 1,
  Question 5 (a) Paper 2 SAM

- Mini Essays - points based marking
  e.g. Question 6 (d) Paper 1 SAM, Question 7(a) Paper 2 SAM

- Calculations: see Mathematics taxonomy
  e.g. Question 7 (b)(ii) Paper 2 SAM

- Data use e.g. Question 6 (c)(i) Paper 2 SAM

CORMS and devising investigations

- **Change** = + and - / range of values;
- (control) Independent variable

- **Organism** = species / size / age / sex / eq;
- (biotic) Controlled variable

- **Repeat** = more than one reading / eq;
- (reliable)

- **Measure** = mass / length / units / time / eq;
- (precise/accurate) Dependent variable

- **Same** = temp. / LI / water / eq;
- (abiotic) Controlled variable

Design an investigation to find out if...

- ... the surface area of a cube of solidified egg white affects the rate at which it is digested by pepsin.

- ...drying is a more effective method of food preservation than freezing.

- ...caffeine in coffee acts as a diuretic.

- ...the sense of smell is more effective in identifying food than the sense of taste.

- ...a sample of food contains fat.

TASK

Design an experiment to find out if …….

…the pulse rate of a class of students varies at rest.

Apply the CORMS mark scheme

Design an experiment to find out if .....

...the pulse rate of a class of students varies at rest.

C	number of students i.e. sufficient number/ more than 10;
O	same gender/age/rested for five minutes prior to experiment;
R	idea of repeats/more than once;
M	count pulse;
S	same described method of counting i.e. finger on wrist/neck

ANSWER 1

I would use five students and tell them to count their pulses for a period of one minute. I would then compare the results to see if there were any differences.

ANSWER 2

I would use twenty students of the same sex and age and tell them to count their pulses for a period of one minute. They would take their pulses by placing two fingers on their wrist and counting the number of beats during the minute. They would repeat the process two more times. I would compare the results to see if there were any differences after working out a mean for each student.

Plotting graphs

Often marked as SLAAP, SLAPU or SLAPUK;

- **S** scale linear and half of each axis
- **L** lines straight, between points and neat
- **A** axis correct way around
- **A** axes labelled
- **P** points plotted correctly
- **U** units correct on each axis
- **K** key if two or more lines

Test	Concentration of enzyme solution/%	Time for paste to flow out/s
1	0.00	32.0
2	0.25	29.0
3	0.50	25.0
4	0.75	19.0
5	1.00	11.0

Mini Essay 1

Explain how your own activities can cause a change in the volume and concentration of urine produced.

(6)

Please construct your mark scheme for this question.

Mini Essay 1 – mark scheme

1. more water taken in/more water drunk;
2. increased volume of urine at lower concentration;
3. increase in protein eaten;
4. More amino acids produced/more deamination;
5. increased concentration of urine;
6. increased salt intake;
7. reduced volume of urine;
8. vigorous exercise;
9. reduced volume of urine increase in concentration;
10. because more water lost by sweating;
11. to control body temperature;

6 marks

Answer 1

There could be more water drunk during the day so that more water would be passed out. I could also run about a lot and sweat so less urine would be produced.

Answer 2

I could drink very little water for a day and this would result in less urine being passed but it would be of a higher concentration. I could also exercise a lot so that I was losing water by sweating to cool my body. This would mean that I would produce less urine at a high concentration. If I had a salty meal that would affect how much urine I produced.

Mini Essay 2

Explain how your own activities might cause changes to your rate and depth of breathing.

(6)

- Please construct your mark scheme for this question.

Mini Essay 2 – mark scheme

1. exercise/named physical activity;
2. increased use of oxygen;
3. increased production of carbon dioxide;
4. increased rate of breathing;
5. changes air more frequently;
6. increased depth of breathing;
7. inflates alveoli more;
8. maintains diffusion gradient for oxygen/carbon dioxide;

6 marks

Answer 1

I could exercise more and this would increase the amount of breathing that I do. This means that I would take in more oxygen and give out more carbon dioxide.

Answer 2

I could carry out 50 press ups. I would then be breathing faster and more deeply. This means that there would be more air going in and out of the lungs and this would maintain a steep diffusion gradient for oxygen.

INTERNATIONAL GCSE
HUMAN BIOLOGY

Practical and mathematical skills

Practicals in the specification

- Specifications contain a number of suggested practicals

- Further suggestions for practicals appear in an Appendix

- The suggested practicals would form a basis for practical work, on which schools would be encouraged to build

- Questions on exam papers test practical skills, rather than recall of specific techniques – so may be in the context of any practical activity

Developing practical skills

Students should be familiar with a range of laboratory apparatus and its use, including the reading of scales.

Students should be able to

- plan an investigation and consider control variables
- to collect and record data in a table
- to plot appropriate graphs with lines of best fit.

Students should be able to

- process and analyse data
- identify and account for anomalies
- evaluate data and methods
- justify a conclusion.

The specification will include guidance on the use of terminology within practical and experimental work.

Practical skills in examinations

Students may be tested on their ability to:

Describe and plan investigations	Draw conclusions consistent with the evidence, using scientific knowledge and understanding
Describe safe and appropriate practical techniques	Communicate findings from experiments using appropriate vocabulary, graphs and calculations
Analyse and interpret data from experimental activities	Evaluate data and methods

Mathematical skills

- The development and use of relevant mathematical skills is key to progress in science subjects

- A list of mathematical skills which should be developed appears in the Appendix for each specification

- These skills will be tested in exam papers within the context of the science

- Assessment of mathematical skills will account for 10% of marks in Human Biology

- See SAMs for an example, but note that mathematics questions have always been asked in previous papers so should not be a surprise

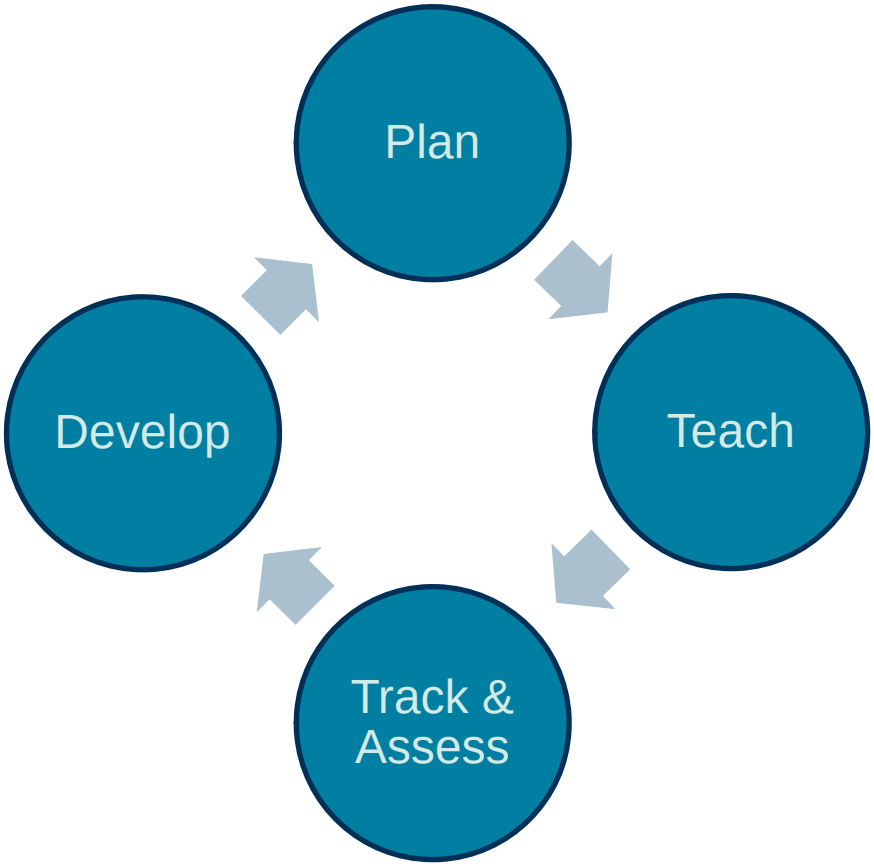
Considering Delivery Strategies and sharing best practice

1. Teaching Strategies.
2. Resources.
3. Technology.

INTERNATIONAL GCSE
Human Biology 2017

Support and published resources

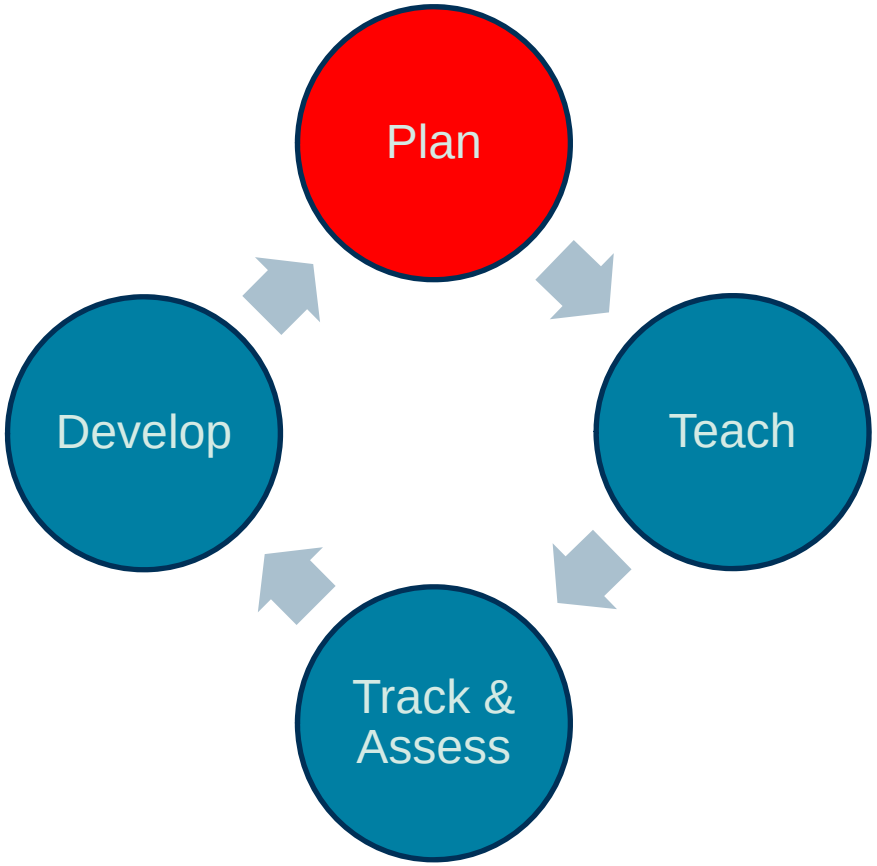
Supporting great science teaching



- We will provide a range of support to help you plan, teach, track and assess, and develop the new course.
- This includes free qualification support to download from our website as well as published resources*

* You do not have to purchase any resources to deliver our qualifications

Supporting great science teaching

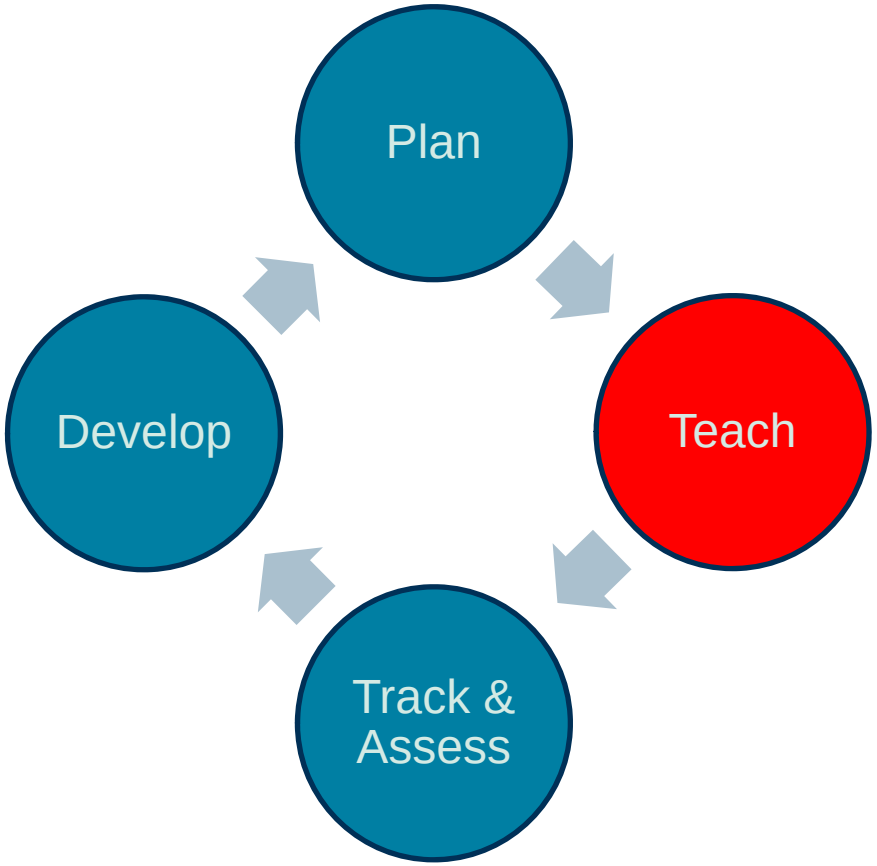


To help you plan the new course we are providing:

Free support for the qualification-

- Getting Started Guide
- Course planners / schemes of work
- Mapping documents

Supporting great science teaching



There will be teaching and learning support to help you deliver the new qualification:

Free support for the qualification:

- Support for maths

Published resources from Pearson:

- Student book and ActiveBook

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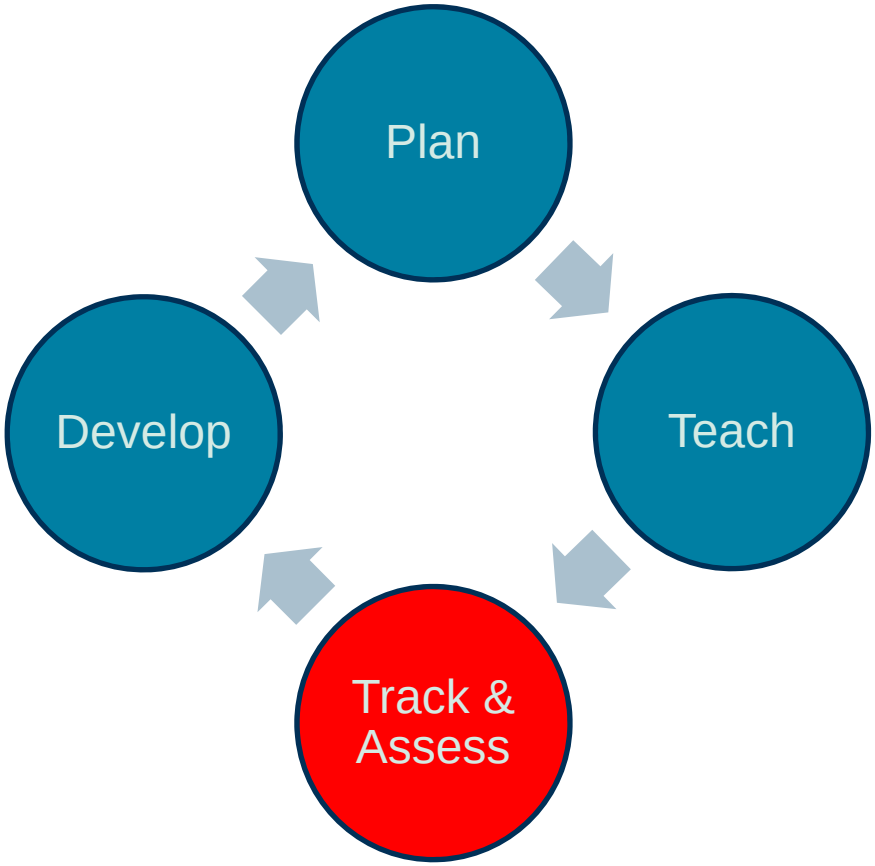


To help you prepare your students for the assessments:

Free support for the qualification:

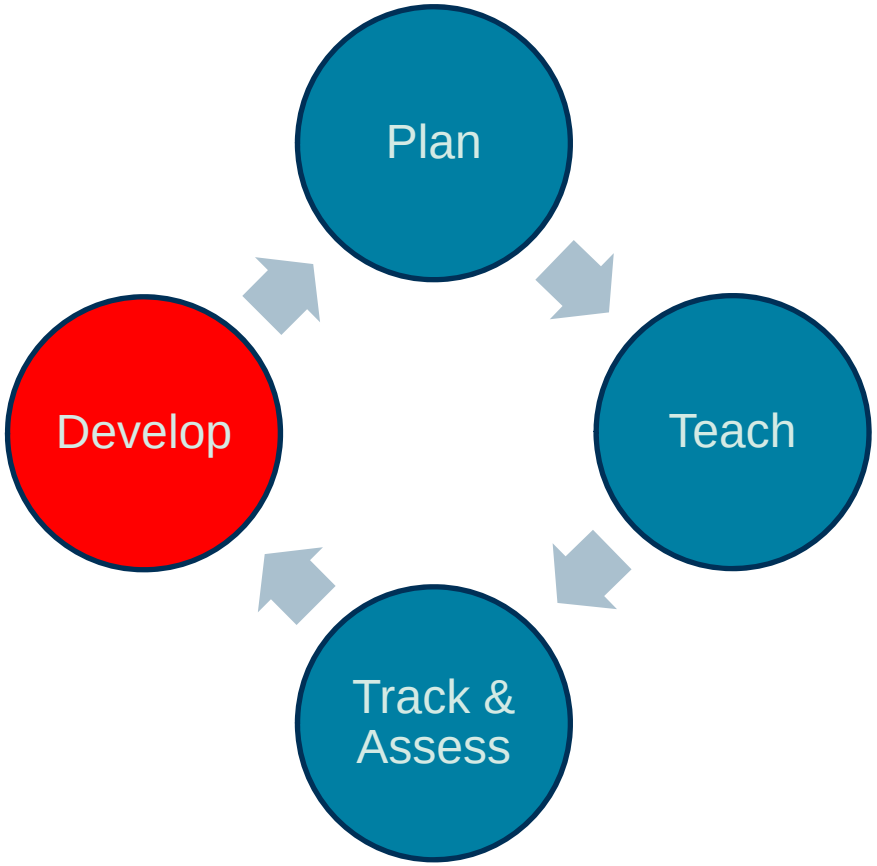
- Specimen papers to support formative assessment and mock exams
- ResultsPlus and ExamWizard

ResultsPlus and ExamWizard

- **ResultsPlus** provides the most detailed analysis available of your students' exam performance. This free online service helps you identify topics and skills where students could benefit from further learning, helping them gain a deeper understanding.

- **ExamWizard** is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiners' reports, so you can create mock papers, homework or practice tests in minutes.

Supporting great science teaching



Our training programme includes:

- Launch events
- Getting Ready to Teach events

Our subject advisor team, led by **Stephen Nugus**, will guide you through all the changes and are on hand to answer any questions you might have.

TeachingScience@pearson.com

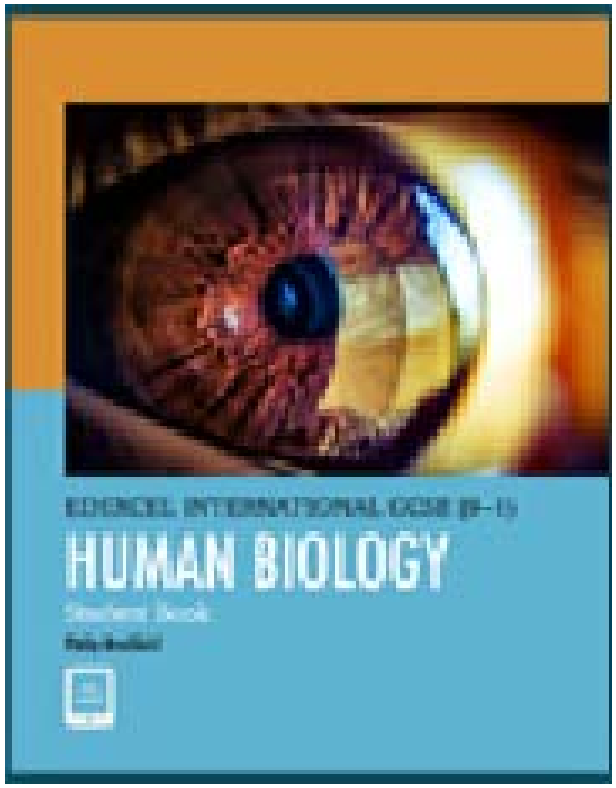
Published resources

We are committed to helping teachers deliver our Edexcel qualifications and students to achieve their full potential. To do this, we aim for our qualifications to be supported by a wide range of high-quality resources, produced by a range of publishers.

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

Published resources – Pearson

http://www.pearsonglobalschools.com



- **Student Book**

This new resource, which includes access to an eBook, has been developed for the new Edexcel International GCSE specification with progression, international relevance and support at their core, and is designed to supply students with the best preparation possible for the examination

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 Edexcel examinations.

Any questions?

Thank you for attending this event.

How did we do?
Please fill in the evaluation form that you'll receive via e-mail in a few minutes.

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ALWAYS LEARNING