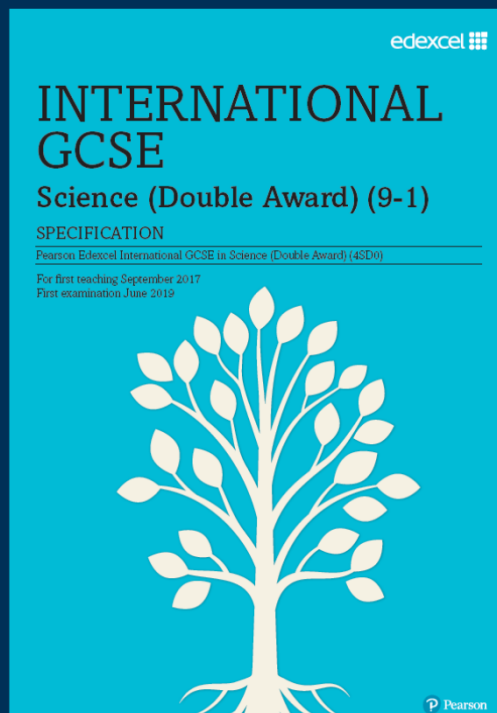
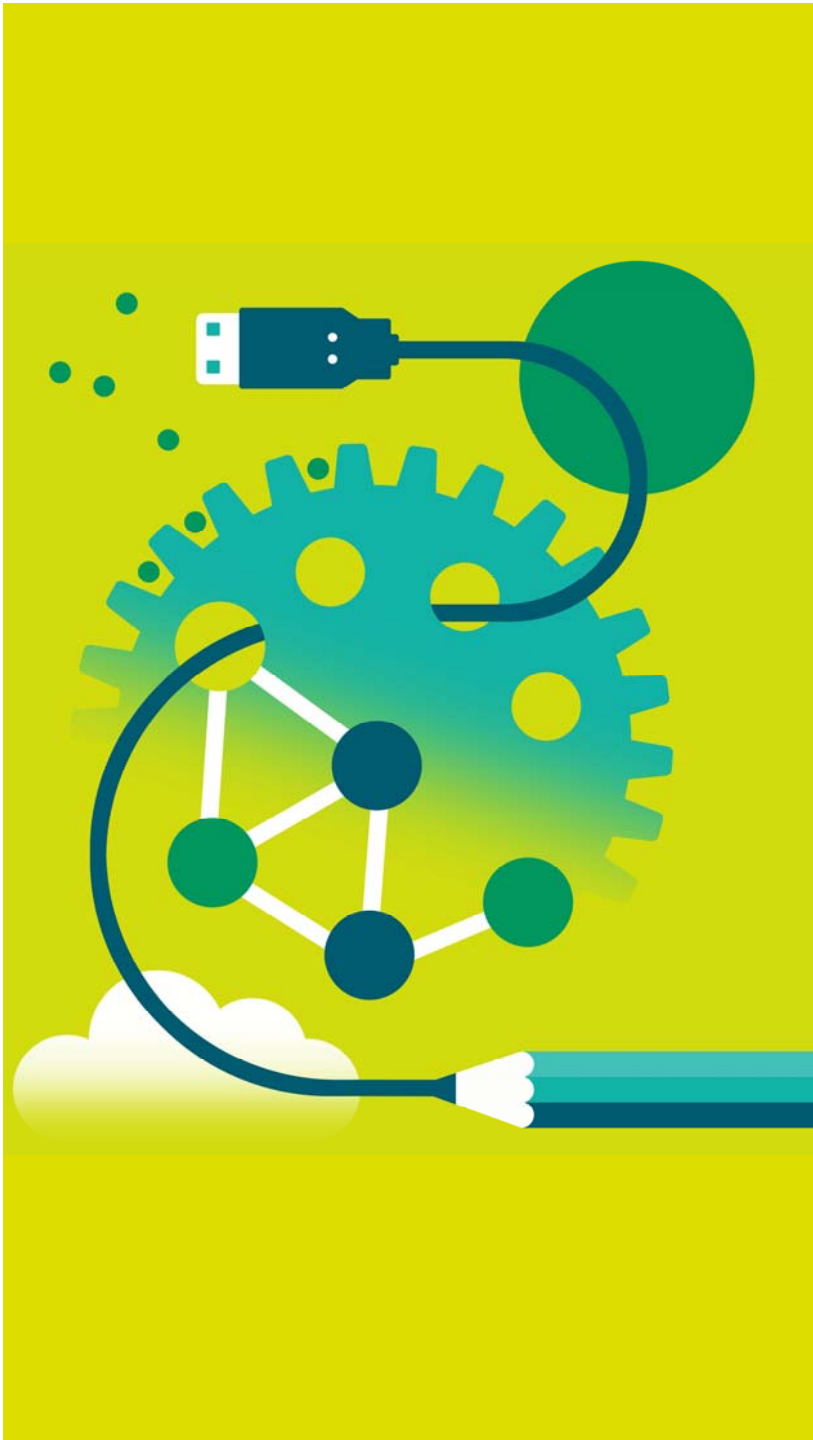


GETTING READY TO TEACH INTERNATIONAL GCSE SCIENCE (DOUBLE AWARD)





Your Online Environment

XX Technical Difficulties & Support

XX Recording

XX Communication in an online environment

XX Asking Questions

XX Using Polls

XX Downloading Documents

**Polls to get to know
the delegates.**

AGENDA

0800-0840

Session 1 – headline changes; detailed Biology changes

0840-0915

Session 2 – retained questions

0915 -0945

Session 3 – new questions; command words & terms, maths and practical skills

0945-0955

Session 4 – support and resources

0955-1000

Session 5 – questions?

INTERNATIONAL GCSE SCIENCE



Introduction to the changes

Headline changes

- Some revisions to subject content; including a review of content split between Double Award and separate sciences
- Slight changes to paper lengths and number of marks
- No change to assessment style; or to assessment of practical skills
- Introduction of new qualification - Science (Single Award)
- Grading moves to new 9 – 1 system



Our suite of International GCSEs

Our International GCSE Science specifications.

EXAM SERIES
January
May / June

BIOLOGY

CHEMISTRY

PHYSICS

SCIENCE (DOUBLE AWARD)

SCIENCE (SINGLE AWARD) - NEW!!

In addition, there is also an International GCSE in Human Biology

Transition assessment dates

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

Science (Double Award)

- Students take Paper 1 in Biology, Chemistry and Physics
- Students achieve two grades, based on performance across all three papers
- The two grades may not be the same
- Students may still progress to A level

Science (Single Award)

This new qualification has:

- Half the content of the Double Award specification; 1 hour paper in each science
- Will share some questions with the Double Award exam and will be a similar level of challenge and rigour
- Students would achieve a single grade, based on performance across all three papers
- Not designed for science progression

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

New grading structure	Current grading structure
9	A*
8	
7	A
6	
5	B
4	C
3	D
2	E
1	F
	G
U	U

GOOD PASS (DfE)
5 and above = top of C and above

AWARDING
4 and above = bottom of C and above

Source:

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

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 who will be awarded Grade 9

$$= (\% \text{ of students who achieved Grade 7} \div 2) + 7\%$$

Grade 9 – an example

- An exam is sat by 12 000 students
- The grade boundaries are set – and 6 000 students are awarded a Grade 7

How many students get a Grade 9?

- 50% of the students have achieved a Grade 7
- So, $(50 \div 2) + 7 = 32\%$ **of the Grade 7 students** will get a Grade 9
- 32% of 6 000 students = 1 920 students

INTERNATIONAL GCSE SCIENCE



Specification content

Biology content summary

There continue to be 5 topic areas in the specification:

Nature and variety of living organisms	Structures and functions in living organisms	Reproduction and inheritance	Ecology and the environment	Use of biological resources
<ul style="list-style-type: none">▪ Characteristics of living organisms▪ Variety of living organisms	<ul style="list-style-type: none">▪ Organisation▪ Cell structure▪ Bio molecules▪ Movement in & out of cells▪ Nutrition▪ Respiration▪ Gas exchange▪ Transport▪ Excretion▪ Coordination & response	<ul style="list-style-type: none">▪ Reproduction▪ Inheritance	<ul style="list-style-type: none">▪ Organisms in environment▪ Feeding relationships▪ Cycles within ecosystems▪ Human influences on environment	<ul style="list-style-type: none">▪ Food production▪ Selective breeding▪ Genetic modification▪ Cloning

Chemistry content summary

There are now 4 sections in the specification instead of 5

Principles of Chemistry

- States of matter
- Elements, compounds and mixtures
- Atomic structure
- Periodic Table
- Equations and calculations
- Bonding
- Electrolysis

Inorganic Chemistry

- Groups 1 & 7
- Reactivity series
- Gases in the atmosphere
- Metal extraction & uses
- Acids alkalis & titrations
- Salt preparation
- Chemical tests

Physical Chemistry

- Energetics
- Rates of reaction
- Reversible reactions and equilibria

Organic Chemistry

- Introduction
- Crude oil
- Alkanes
- Alkenes
- Alcohols
- Carboxylic acids
- Esters
- Polymers

Physics content summary

There are now 8 topic areas in the specification:

**Forces and
motion**

Electricity

Waves

**Energy
resources and
energy
transfers**

**Solids, liquids
and gases**

**Magnetism
and electro-
magnetism**

**Radioactivity
and particles**

Astrophysics

Overview of changes in Biology

Some additions:

- Terms eukaryotic and prokaryotic
- Mitochondria & ribosome function
- Test for protein and lipid
- Risk factors for coronary heart disease
- Role of auxin in phototropism

Overview of changes in Biology

Moving from Double Award into Biology:

- **Balanced diet and activity/age/pregnancy energy requirements**
- **Gas exchange in plants – stomata and leaf structure**
- **Transpiration and CP role of environmental factors**
- **Kidney function**
- **DNA structure**
- **Genetic mutations**
- **Investigating distribution/biodiversity using quadrats**
- **Deforestation**
- **Fish farming**
- **Micropropagation and cloning**

Overview of changes in Biology

Moving from Biology into Double Award:

- Core Practical investigate evolution of carbon dioxide and heat from respiring seeds
- Role of phloem
- Structure and function of the eye
- Temperature regulation
- Seed germination
- Placenta and developing embryo
- Sewage pollution
- Fermenters and production of yoghurt
- Transgenic organisms

Overview of changes in Chemistry

- Suitable preparation for progression to reformed UK and International A levels
- Content rearranged into 4 sections instead of 5
- Less Industrial Chemistry content (old section 5)
- “Embedded” practicals (core practicals)
- Additions mostly affect Chemistry, not Double Award

Overview of changes in Chemistry

Moving from Double Award into Chemistry:

- **Calculations involving titrations and gas volumes**
- **Metallic bonding**
- **Electrolysis**
- **Preparation of soluble salts by titration**
- **Preparation of insoluble salts by precipitation**

What changes in Physics?

Some general changes:

- Embedded practicals – it will be assumed students have performed these:
 - ❖ **12 in Physics**
 - ❖ (8 in Double Award)
- Collecting Double Award and **Physics (P) only** material within each topic so that statements are clearer.

What changes in Physics?

FORCES AND MOTION

- Introduction of $v^2 = u^2 + 2as$
- Clarification stopping, thinking and braking distance
- Understanding of vectors and scalars moved to Double Award
- **All understanding of moments moved to Physics**

ELECTRICITY

- Hazards of mains electricity has been removed
- Introduction of understanding of current conservation in circuits
- **All understanding of static electricity moved to Physics**

What changes in Physics?

WAVES

- Diffraction; analogue and digital signals have been removed
- Ray diagrams for virtual image formation has been removed
- Introduction of ray diagrams for reflection and refraction
- Introduction of (qualitative) Doppler effect
- **All understanding of sound waves moved to Physics**

ENERGY

- Introduction of emission & absorption of thermal radiation being linked to surface colour and finish
- **All energy resources moved to Physics**

SOLIDS, LIQUIDS & GASES

- Brownian motion has been removed
- All understanding of ideal gases moved to Double Award

What changes in Physics

MAGNETISM

- All magnetism moved to Double Award

RADIOACTIVITY

- Rutherford scattering has been removed
- Introduction of the difference between contamination and irradiation
- Introduction of nuclear fusion

ASTRONOMY

- Motion in the universe has been moved from topic 1
- Introduction of stellar evolution

Mapping documents

- The website has further mapping documents detailing the changes to the specification
- There are also schemes of work to help you plan the delivery of the new specifications

INTERNATIONAL GCSE SCIENCE



Assessment model

Summary of assessment

FAMILIAR ...

100% external assessment – with no coursework

Linear assessment – all exams take in the same exam session

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

Single tier of entry (untiered)

... AND NEW

Questions using maths skills
(10% in Bio
20% in Chem
30% in Physics)

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

Assessment objectives

A01

Knowledge and understanding of biology / chemistry / physics

~ 40%
(45-50)
of total marks

A02

Application of knowledge and understanding, analysis and evaluation of biology / chemistry / physics

~ 40%
(27.5-32.5)
of total marks

A03

Experimental skills, analysis and evaluation of data and methods in biology / chemistry / physics

~ 20%
(20-25)
of total marks

Assessment summary

Paper 1

Two hours; 110 marks
will **NOT** include the specification statements printed in **BOLD**

Paper 2

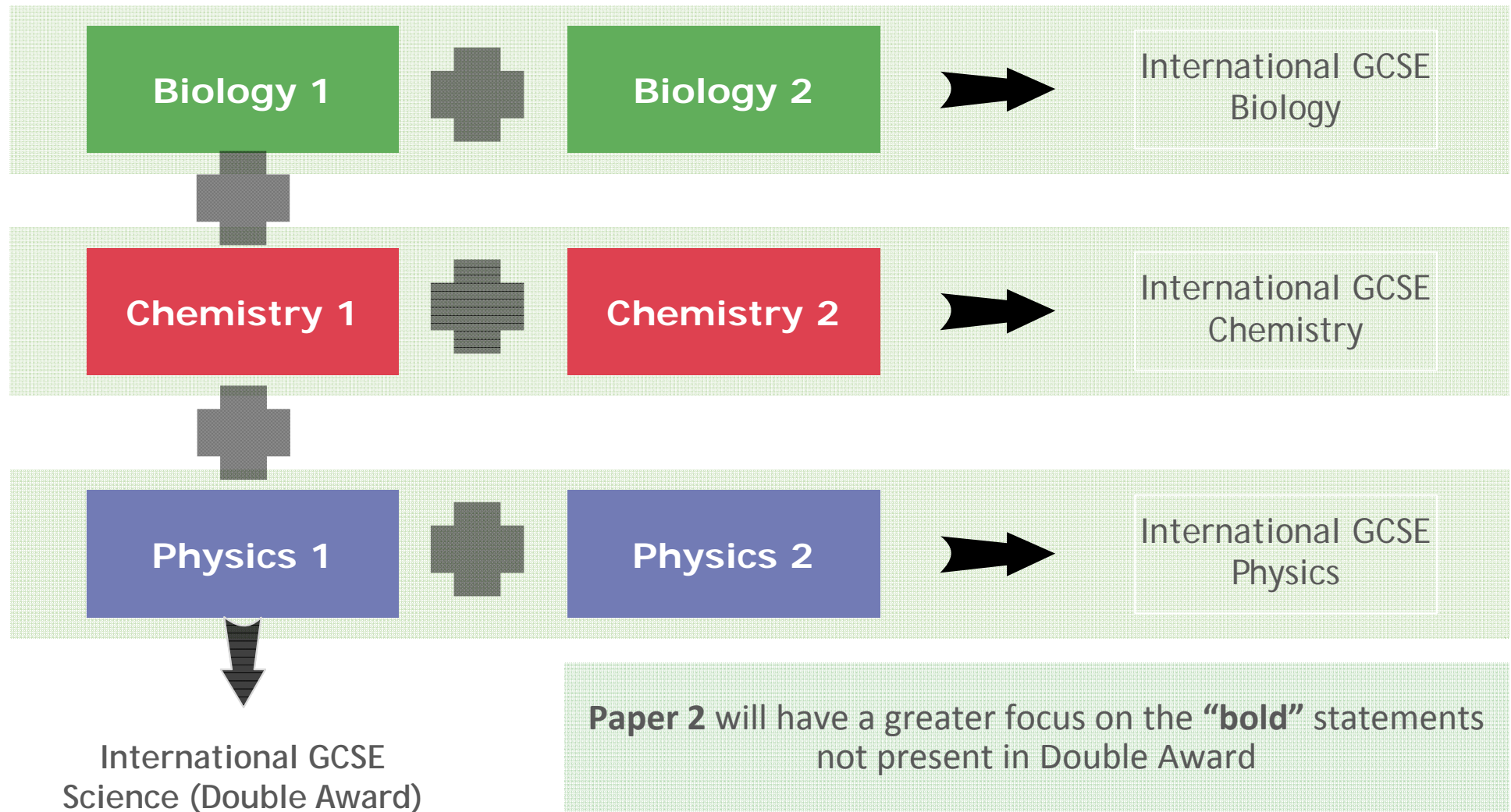
One hour and 15 minutes; 70 marks
includes **ALL** the specification statements, including those in **BOLD**

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

The AO3 questions
are likely to be in a practical
context

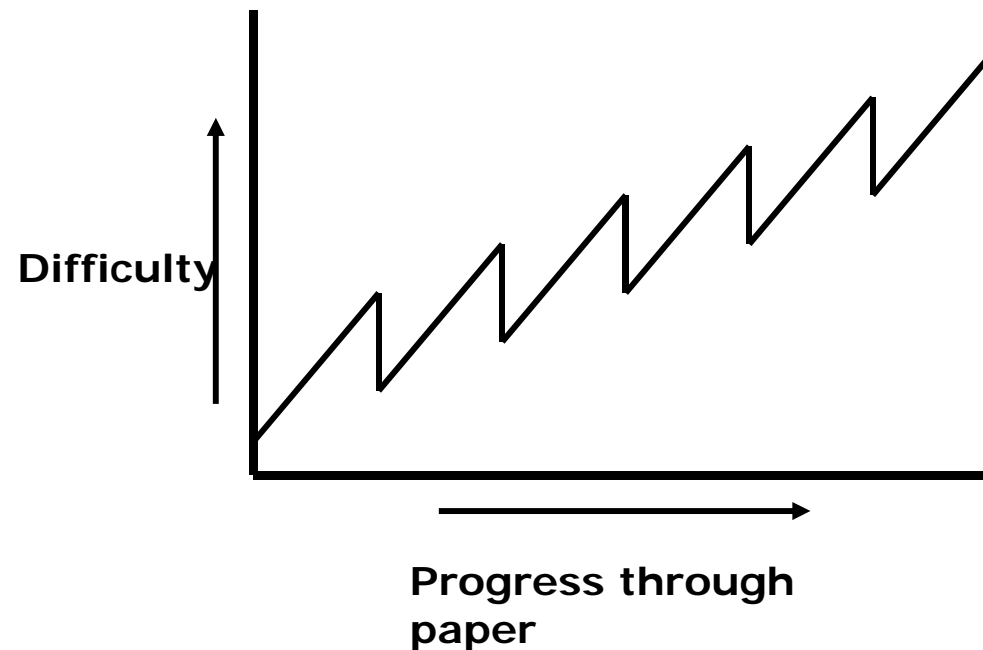
Both papers have similar question types

Structure of papers



An ideal incline of difficulty

- Increase in difficulty within each question
- Increase in difficulty from first question to last question



Exam question guide

The question style is similar to that of the existing International GCSE:

A small number of multiple choice questions

Short answer responses, usually worth 1 – 3 marks

Longer answer questions, up to 6 marks

All questions are **compulsory** and may cover **practical** situations as well as **areas** of theory

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

Some subject specific issues

- BIOLOGY – retains a “CORMS” question
- PHYSICS – equations which students need to remember are marked in the specification as “know and use...”
- - other equations are just “use...” and will be provided on the formula sheet

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**

What changes in Energy Resources and Energy Transfer?

The Institute of Physics has recently issued new guidance on how the topic of energy should be taught in schools.

8 energy *stores*:

- Kinetic
- Gravitational
- Elastic
- Chemical
- Nuclear
- Magnetic
- Electrostatic
- Thermal

4 energy *transfers*:

- Mechanically
- Electrically
- By heating
- By radiation (light & sound)

What changes in Energy Resources and Energy Transfer?

The Institute of Physics has recently issued new guidance on how the topic of energy should be taught in schools.

Energy can be stored in different forms (the stores) but, when transferred between forms, there are various mechanisms by which this can happen (the transfers).

e.g. light is not a store of energy. Light is an electromagnetic wave. However, it is *by light* that energy can travel from the Sun to the Earth.

INTERNATIONAL GCSE SCIENCE



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

Embedded practicals

- do students have to do them?

- The simple answer is no - but it needs to be remembered that some examination questions assume that students have detailed knowledge of practical techniques
- There is evidence that students perform better in written examinations when they have had more direct experience of practical work
- Ideally, students would carry out all the embedded practicals, either individually, or in pairs, or in small groups
- If this is not possible, then less good alternatives would be teacher demonstrations, or watching suitable video clips

Developing practical skills

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

1

Students should be able to plan an experiment and control variables, to collect and record data in a table, and to plot appropriate graphs with lines of best fit.

2

Students should be able to process and analyse data, to identify and account for anomalies, to evaluate data and methods, and to justify a conclusion.

3

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

4

Practical skills in examinations

Students may be tested on their ability to:

Describe and plan experiments

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

Describe safe and appropriate practical techniques

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

Analyse and interpret data from experimental activities

Evaluate data and methods

Mathematical skills

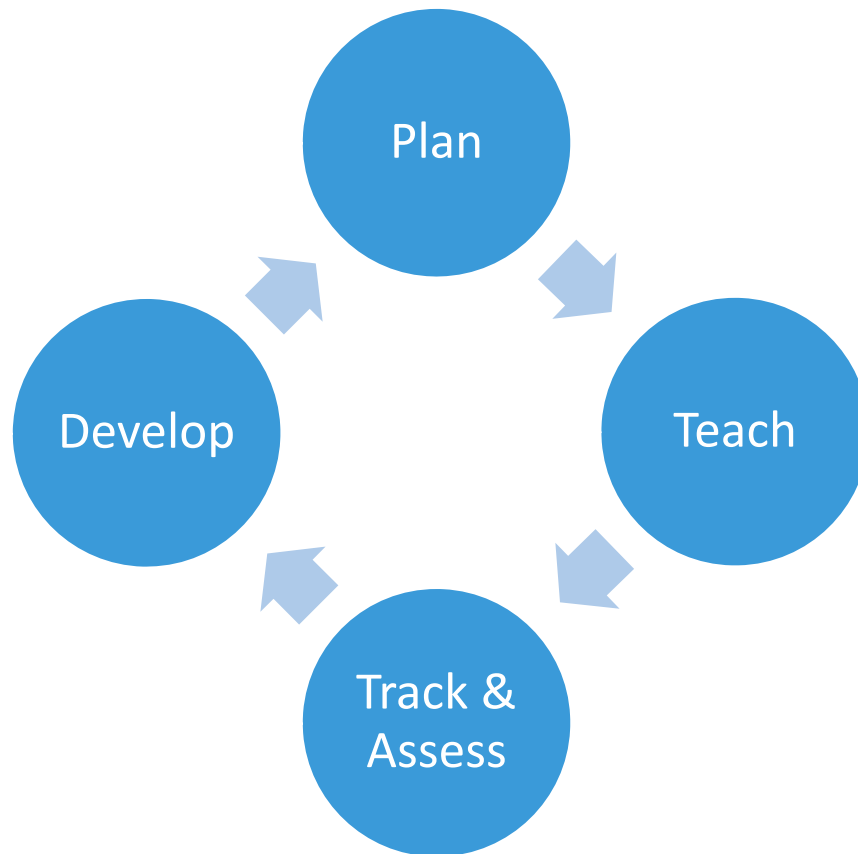
- The development and use of relevant mathematical skills is key to progress in science subjects
- A list of mathematical skills which should be developed appears in the Appendix for each specification
- These skills will be tested in exam papers within the context of the science
- Assessment of mathematical skills will account for 10% of marks in Biology, 20% in Chemistry and 30% in Physics
- See SAMs for an example, but note that maths questions have always been asked in previous papers so should not be a surprise

INTERNATIONAL GCSE SCIENCES 2017



Support and published resources

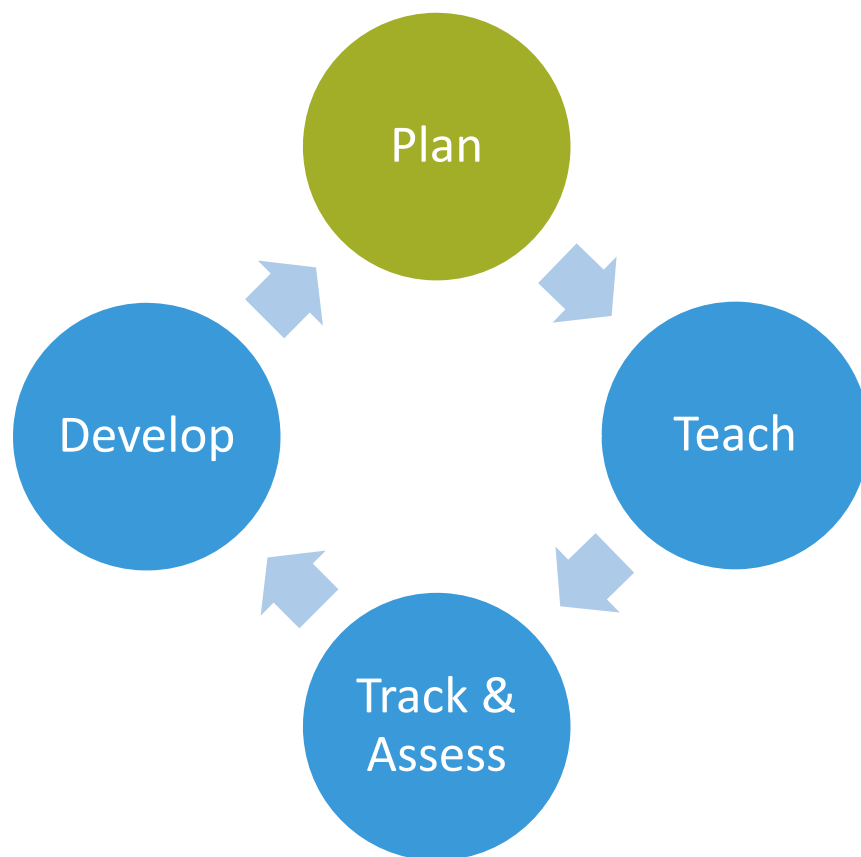
Supporting great science teaching



- 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

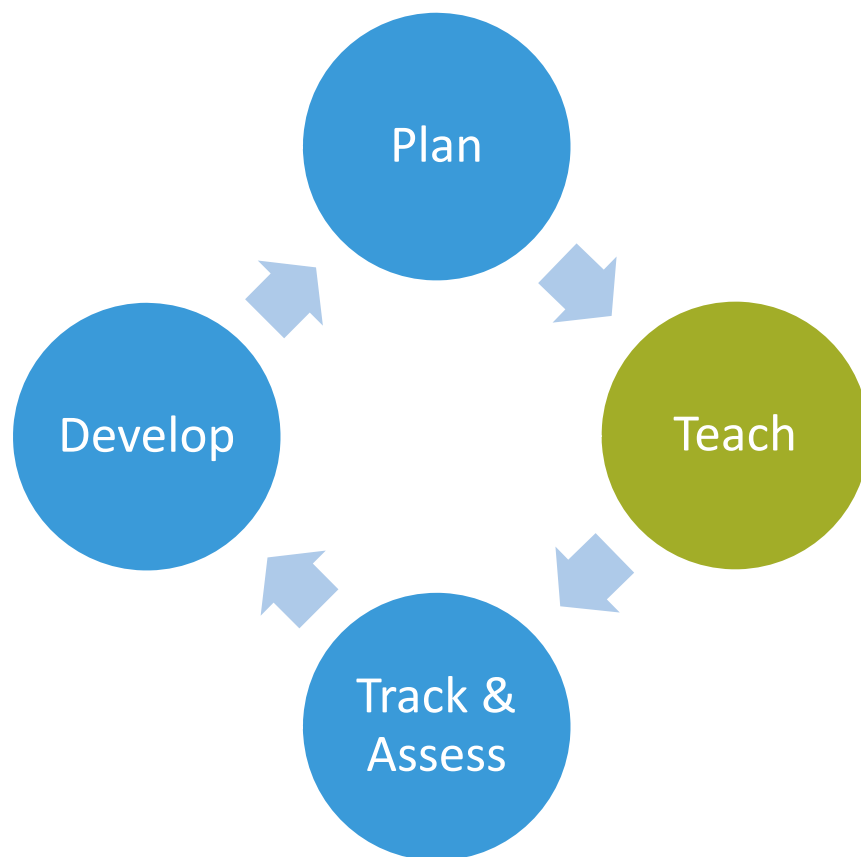


To help you plan the new course we have provided:

Free support for the qualification:

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

Supporting great science teaching



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

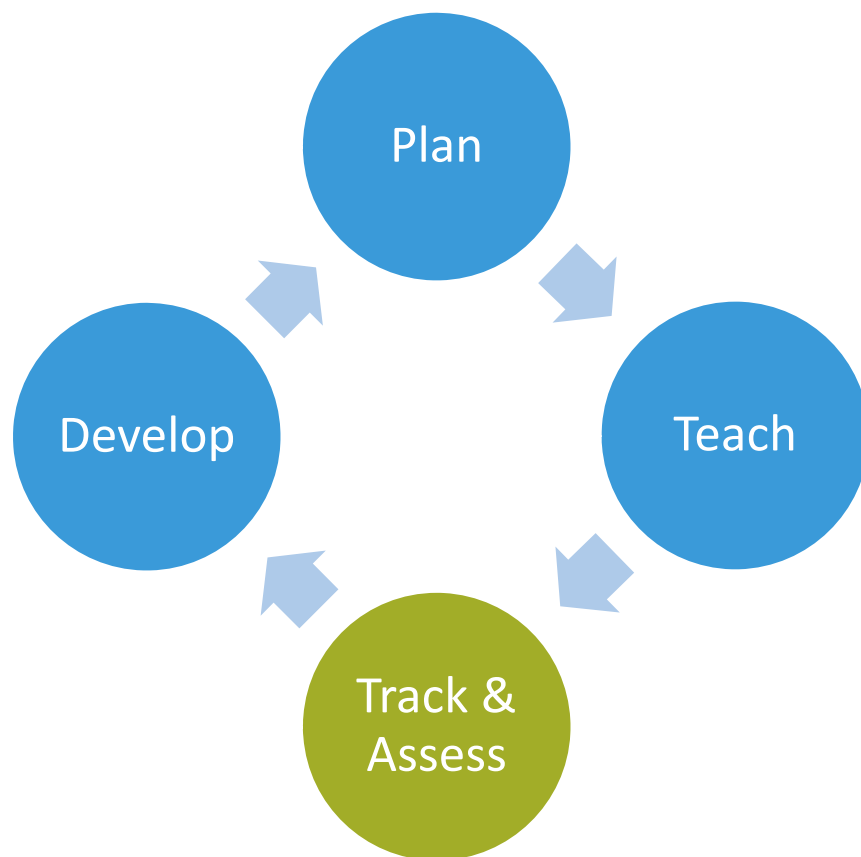
Free support for the qualification:

- Support for practical activities
- **Ask the Expert**

Published resources from Pearson:

- Student book and ActiveBook

Supporting great science teaching



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

Published resources from Pearson:

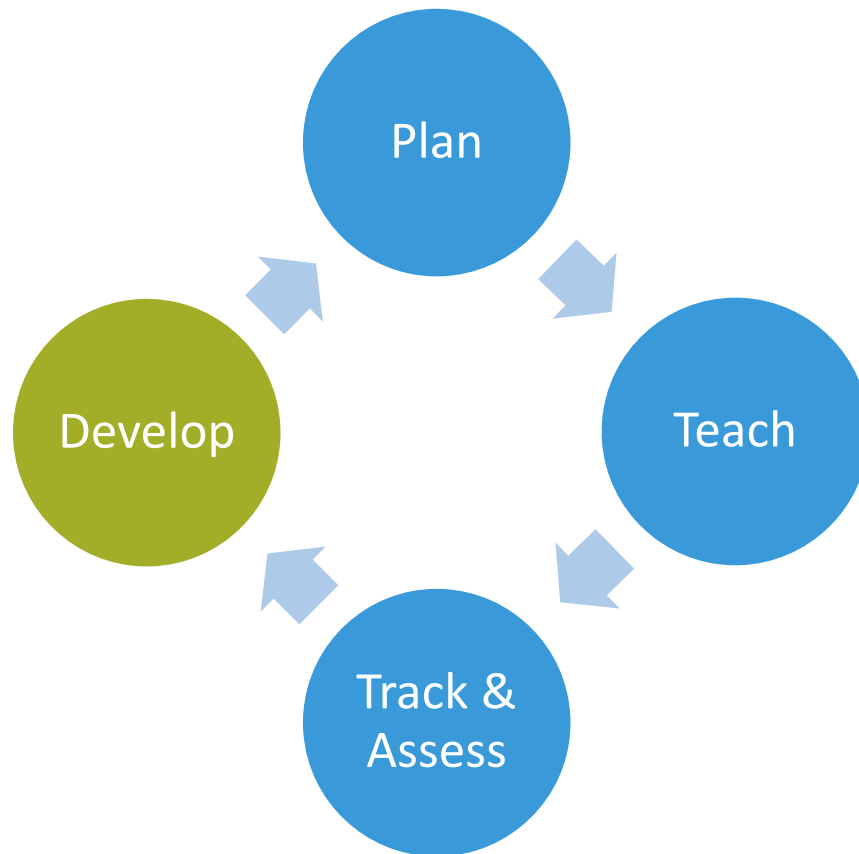
- Consideration is being given to a Revision Guide and Workbook

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

ResultsPlus and Exam Wizard

- 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.
- Exam Wizard 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:

- 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.

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.

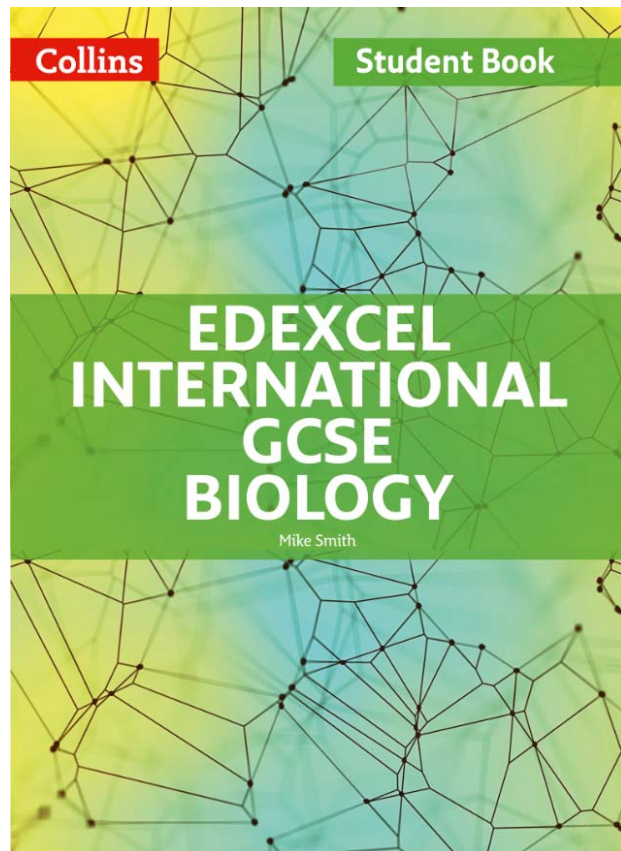
However, it is not necessary to purchase endorsed resources to deliver our qualifications.

Published resources

- Specifications have been shared with a number of publishers, with a view to having a range of resources available.
- Publishers who express an interest will be invited to submit resources for endorsement.
- The next slides give details of publishers who have shared their plans at this stage.

Published resources – Collins

www.collins.co.uk/category/International/Ages+14-16/Science/



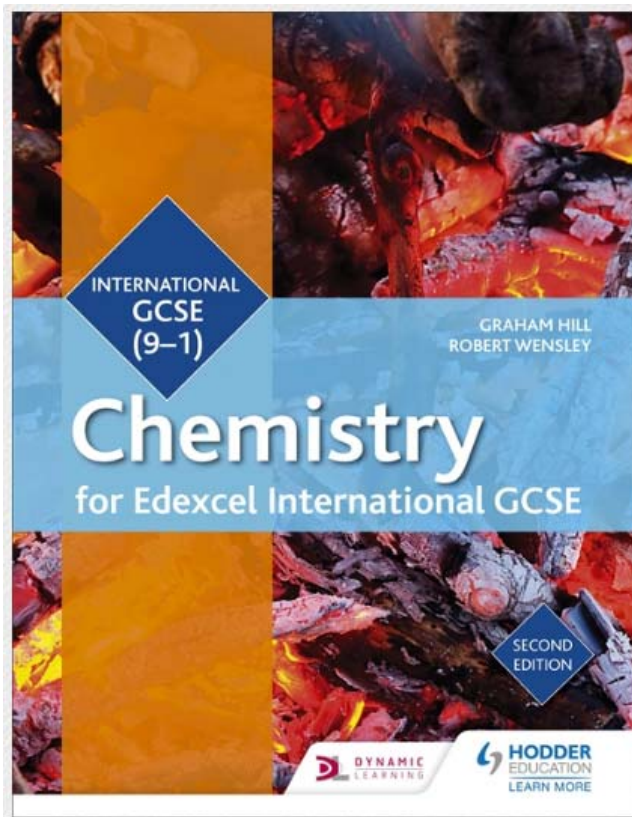
- **Student Book – from June 2017**
- **Teacher Pack – from June 2017**

The Collins Student Book allows you to co-teach Edexcel International GCSE separate sciences and Double Award Science

It is packed full of engaging content, practical skills features and questions, and is rigorously updated for the new specifications.

Published resources – Hodder

www.hoddereducation.co.uk/edexceligcse



- **Student Book – from May 2017, and as an eBook from June 2017**

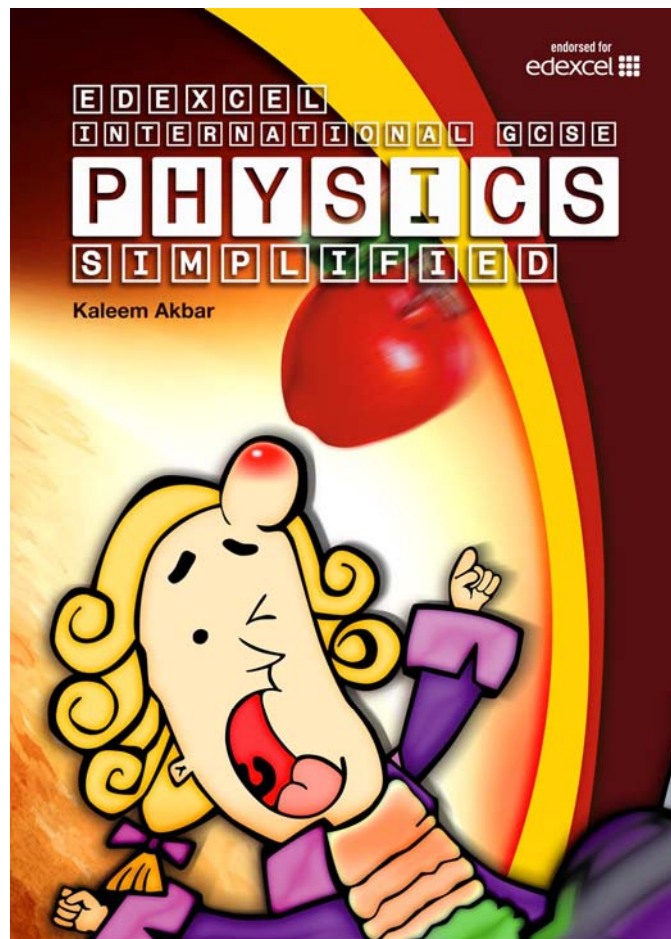
Provide your students with complete coverage of the new Edexcel International GCSE specifications with these affordable student books written by expert authors and teachers; testing knowledge and building practical skills throughout.

- **Workbook – from July 2017**

Maximise every student's performance with exam-style questions, sample answers and examiner comments, written to support and enhance the content of the Edexcel International GCSE books.

Published resources – International GCSE Physics

www.igcsephysics.com/edexcel/



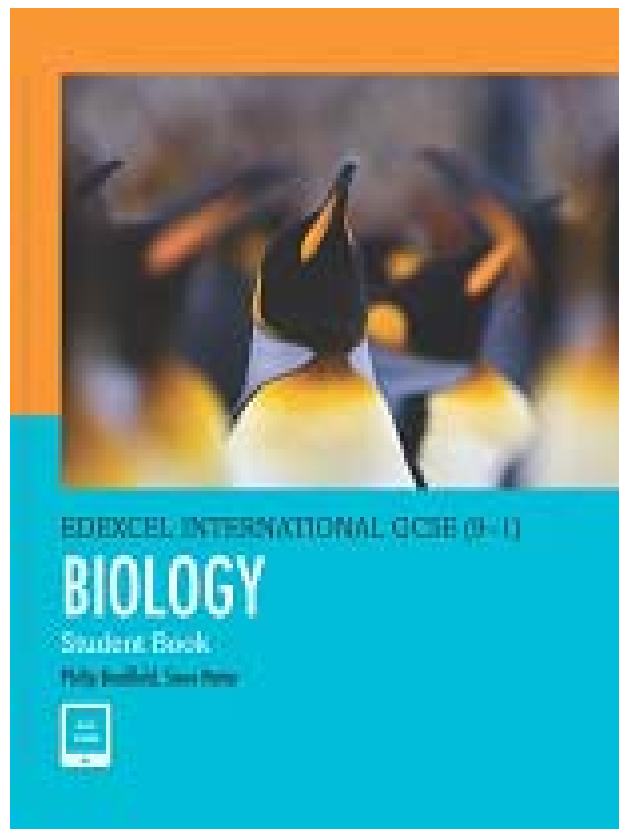
Edexcel International GCSE Physics Simplified provides everything students need as they prepare for their International GCSE examinations. It is written to take the mystery out of physics but to keep the magic in!

Straightforward language and a helpful glossary ensure that the book is accessible to all. Clear images aid understanding; worked example questions are provided throughout. National and international teaching experience of over a decade ideally places the author to understand the requirements of students both in the UK and abroad.

Published resources – Pearson

www.pearsonglobalschools.com/

NOTE: Pearson is publishing a specific Double Award book



- **Student Book – from May 2017**

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.

- **Teacher Pack– from August 2017**

This new resource, available online, will include videos, worksheets, lesson plans and other support to help you deliver the International GCSEs

Finally

Any questions?

**Please complete your evaluation form which will be
emailed to you.**