Pearson Edexcel

International GCSE Science

Getting Ready to Teach International GCSE Physics

Pearson Edexcel

Aims & Objectives

In this training, you will:

- look at how the qualification is arranged
- review the content of the qualification
- explore how to plan the course and/or lessons
- Understand the assessment objectives for the qualification
- Understand the question types and mark schemes for the qualification
- Practice using the mark schemes using some exemplar student work
- Look at the way in which practical skills are assessed
- Consider exam technique and time management in an exam
- identify the support available from Pearson.

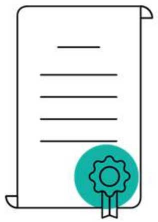
Welcome to Pearson

Welcome to Pearson Edexcel

- We are the world's leading learning company and as the UK's largest awarding organisation, best placed to provide qualifications aligned to the British educational system.
- Our international heritage stretches back over 150 years.
- Today, we partner with schools, universities and employers worldwide, offering world-class, globally-recognised qualifications to over 3.5 million students a year.

Pearson Edexcel

Trusted and recognized qualifications partner to 6,500 schools, colleges and employers globally



We mark over 10 million exam scripts on behalf of the UK Department for Education each year

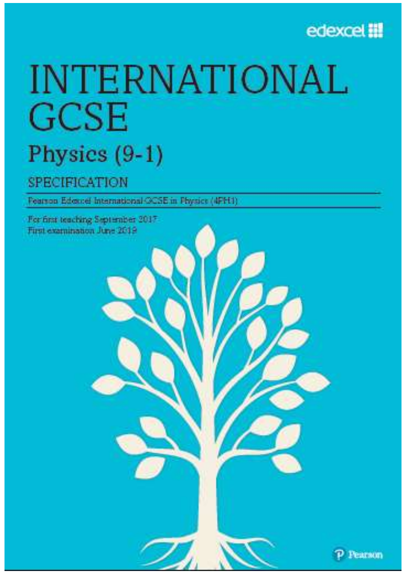
We operate in 70 countries worldwide

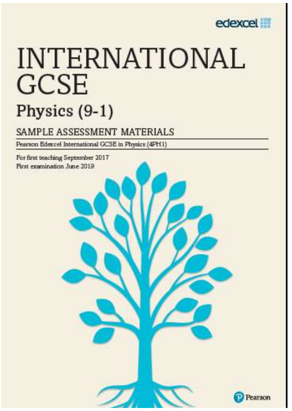
Specification & Assessment Overview

What is the specification?

- The specification is the main document you need to teach the course.
- It outlines the aims of the course, the content you MUST cover and all the information you need about assessing your students.
- A copy of this document is in your pack and on our website.

There are also Sample Assessment Materials. This document provides examples of the question papers and was especially useful when this specification was launched. Since there are now at least two series of live exam papers, it is arguable that the real papers become a more important resource than the SAM.





Using the specification

Content: this is arranged as eight topics. As a minimum, all the bullet points in the content must be taught. The word 'including' in the content helps specify the detail of what <u>must</u> be covered.

Examples: throughout the content, we have included examples of what could be covered or what might support T&L. It is important to note that centres can use other examples.

Practical investigations: included as specification points in italics.

Referencing: specification statements that are in bold with a 'P' reference relate to content that is only in the International GCSE in Physics (not the combined science double award)

Practical investigation

Physics only, not Double Award Sci

(b)	Magnetism
Students should:	
6.2	know that magnets repel and attract other magnets and attract magnetic substances
6.3	describe the properties of magnetically hard and soft materials
6.4	understand the term magnetic field line
6.5	know that magnetism is induced in some materials when they are placed in a magnetic field
6.6	*practical: investigate the magnetic field pattern for a permanent bar magnet and between two bar magnets*
6.7	describe how to use two permanent magnets to produce a uniform magnetic field pattern

(c)	Electromagnetism
Students should:	
6.8	know that an electric current in a conductor produces a magnetic field around it
6.9P	**describe the construction of electromagnets**
6.10P	**draw magnetic field patterns for a straight wire, a flat circular coil and a solenoid when each is carrying a current**
6.11P	**know that there is a force on a charged particle when it moves in a magnetic field as long as its motion is not parallel to the field**
6.12	understand why a force is exerted on a current-carrying wire in a magnetic field, and how this effect is applied in simple d.c. electric motors and loudspeakers
6.13	use the left-hand rule to predict the direction of the resulting force when a wire carries a current perpendicular to a magnetic field
6.14	describe how the force on a current-carrying conductor in a magnetic field changes with the magnitude and direction of the field and current

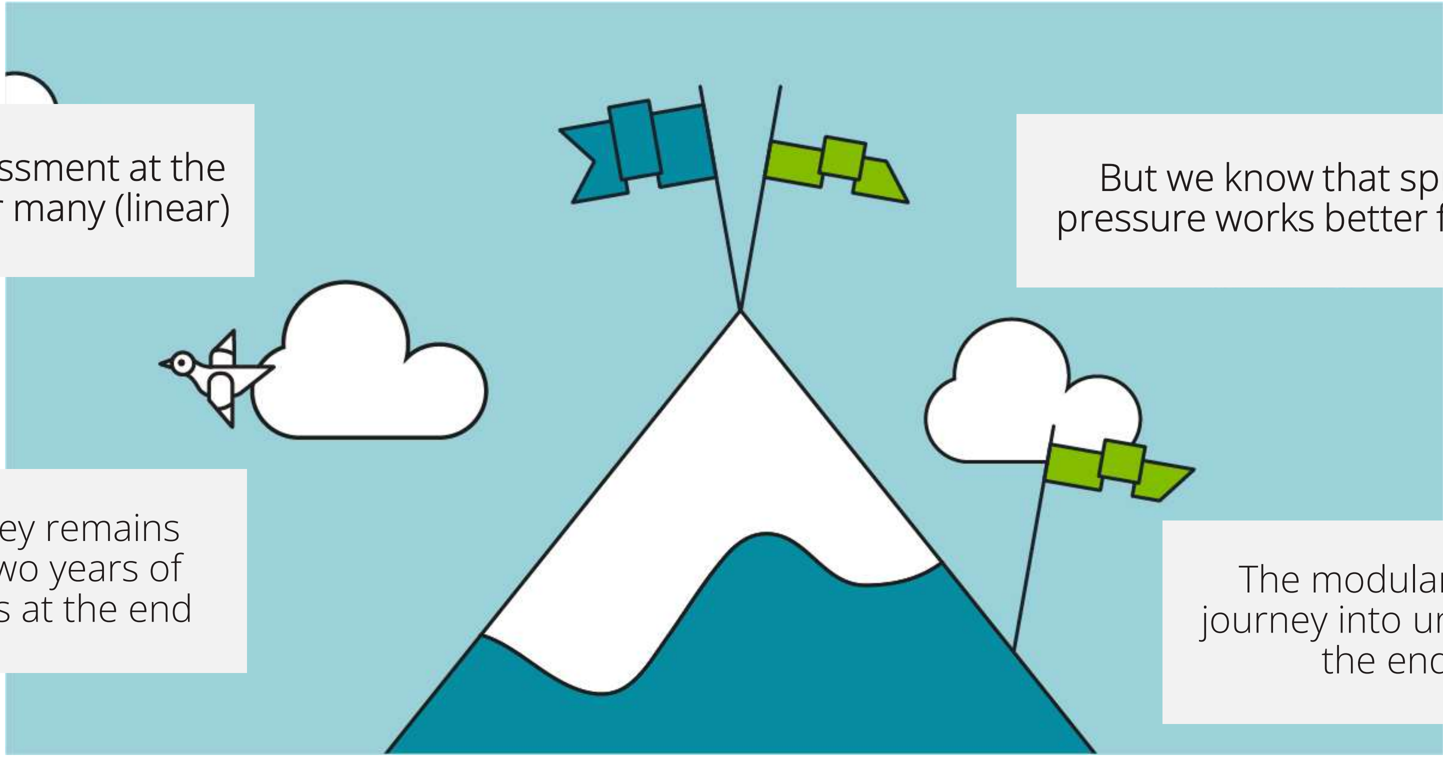
Modular Overview

Why a choice of linear or modular assessment?

The secret of International GCSE success is different for every student.

Doing all the assessment at the end works well for many (linear)

But we know that spreading the exam pressure works better for others (modular)



The linear journey remains exactly as it is, two years of study with exams at the end

The modular route breaks the journey into units, with an exam at the end of each unit

Whichever route you choose, the exams take the same amount of time, teachers spend the same amount of time teaching, and everyone has the best chance of success at international GCSE.

The two different routes of Assessment

If you're happy with the linear approach, there is no pressure to move to the modular route; our linear International GCSEs will continue to be offered and taken widely by students around the world.

Modular route

Unit assessments can be taken over multiple exam series.

Grades are calculated on raw marks which are then converted to a UMS (Uniform Mark Scale).

Students can re-sit individual units in any exam series.

Once a student has all their unit results, they can 'cash in' these results for their grade.

A modular route is only offered by Pearson Edexcel at International GCSE

Linear route

Assessments for all units are taken together in one exam series.

Grades are calculated on raw marks only.

Students can re-sit assessments for all units together in one exam series.

The grade students receive are calculated at the end of the exam series in which they sat their assessments.

Everything else remains the same, including content and level of demand in assessments

A student’s IG Science modular journey

Modular pathway	2024	2025	2026
Student is taking their International GCSE	**Sept** Start learning course content	**June** Exam for Unit 1; **Sept** Continue learning content	**June*** Exam for Unit 2
What entries to make and when		**By 21st March** Entry using **Unit** code for Unit 1 only on EOL ('W')	**Nov - March** Entry using **Unit** code for Unit 2 AND **cash in code ('X')**
Results and Certification		**August** Result available for Unit 1	**August** Result certificate generated for Unit 1+2 = IG

*re-sit opportunity

The benefits of a modular approach

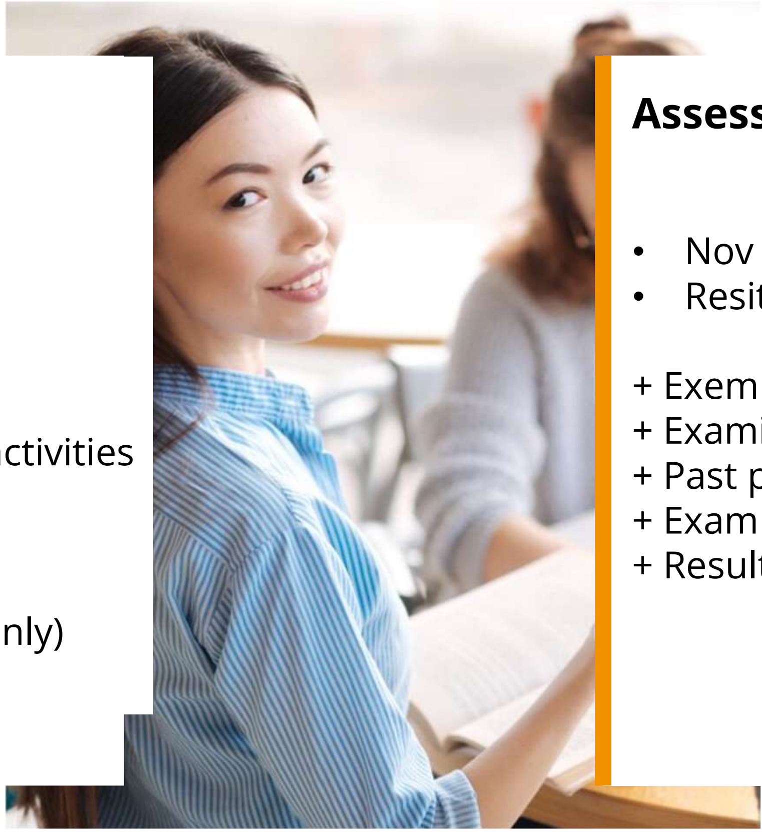
Students

- ✓ Reduces students' **mental load** and **stress** by allowing them to focus on one year of curriculum at a time and spreads out their exams over 2 years.
- ✓ Provides more **opportunities** to demonstrate their skills and abilities and optimise feedback to improve their performance.
- ✓ Allows them to take exams when they're ready, like they do with other tests, and take advantage of multiple **re-sit** opportunities.

Educators & Parents

- ✓ Provides teachers with rich mid-cycle data on learner **performance** via post-exam analysis support tools such as Results Plus.
- ✓ **Eases the pressures** faced by exam officers as it allows international schools to spread the exam admin burden.
- ✓ Where parents pay exam fees, it helps with **budgeting** by enabling families to spread their child's exam fees over two years.

IG Physics Modular Overview

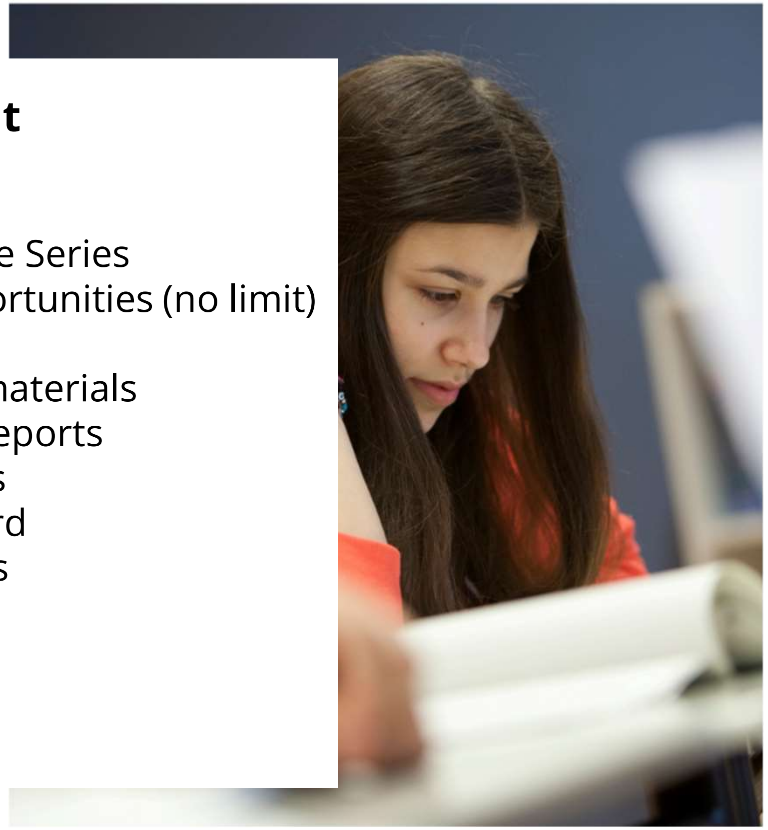


Teaching and Learning

120 GLH for Physics

- Specification
- Getting Started Guides
- Teacher Course planners
- Scheme of Work
- Lesson Plans suggested activities

+ Student Books
+ Student lab books
+ Teaching Hubs (separate only)



Assessment

- Nov & June Series
- Resit opportunities (no limit)

+ Exemplar materials
+ Examiner reports
+ Past papers
+ Exam Wizard
+ Results Plus

A Question for you

How do you see the Modular assessment pathway supporting your students?

Physics Modular Content

Physics: a closer look, Paper 1

The modular and linear approach contact the same content, but the modular approach breaks the journey into two units with an exam at the end of each unit.

Paper 1	
Linear	Modular
2-hour written examination.	1-hour-40-minute written examination.
The total number of marks is 110, 61.1% of the total International GCSE.	The total number of marks if 90, 50% of the total International GCSE.
Content summary Assesses core content that is NOT in bold and does not have a 'C' prefix. Questions may come from any topic area across the specification. Topic 1. Forces and Motion Topic 2. Electricity Topic 3. Waves Topic 4. Energy resources and energy transfer Topic 5. Solids, liquids and gases Topic 6. Magnetism and electromagnetism Topic 7. Radioactivity and particles Topic 8. Astrophysics	Content summary Topic 1: Forces and Motion a. Units b. Movement and position c. Forces, movement, shape and momentum Topic 2: Electricity a. Units b. Mains electricity c. Energy and voltage circuits d. Electric charge Topic 4: Energy resources and energy transfer a. Units b. Energy transfer c. Work and power d. energy resources and electrical generation Topic 5: Solids, liquids and gases a. Units b. Density and pressure c. Change of state

Physics: a closer look, Paper 2

The modular and linear approach contact the same content, but the modular approach breaks the journey into two units with an exam at the end of each unit.

Paper 2	
Linear	**Modular**
1-hour-15-minute written examination.	1-hour-40-minute written examination.
The total number of marks is 70, 38.9% of the total International GCSE.	The total number of marks if 90, 50% of the total International GCSE.
Content summary Assesses all the content including content that is in bold and has a 'C' prefix. Questions may come from any topic area across the specification. Bold statements cover some topics in greater depth.	Content summary Topic 3: Waves a. Units b. Properties of waves c. The electromagnetic spectrum d. Light and sound Topic 4: Energy resources and energy transfers d. Energy resources and electrical generation Topic 5: Solids, liquids and gases a. Units d. Ideal gas molecules Topic 6: Magnetism and electromagnetism a. Units b. Magnetism c. Electromagnetism d. Electromagnetic and electromagnetism Topic 7: Radioactivity and particles a. Units b. Radioactivity f. Fission and fusion Topic 8: Astrophysics a. Units b. Motion in the universe c. Stellar evolution d. Cosmology

Teaching considerations & supporting student progress

- Same considerations that you would have with a linear course e.g. sequencing, threshold concepts, development of disciplinary and substantive knowledge, interleaving etc.
- June & November series - First assessment June 2025
- Multiple combinations of papers e.g.

Example 1

- Unit 1 end of Y10 (June)
- Unit 2 end of Y11 (June)

Example 2

- Unit 1 Y10 (June)
- Unit 1 re-sit Y11 (Nov)
- Unit 2 end of Y11 (June)

Example 3

- Unit 1 & Unit 2 Y11 (Nov)
- Unit 2 re-sit Y11 (June)

CP0

Supporting progression

Builds on prior knowledge from iP & iLS

Provides the foundational knowledge for IAS and IAL

12.6	understand that some materials conduct electricity better than others using the terms *electrical conductor* and *insulator*

iPrimary

33.7	know that a wire with an electric current flowing through it creates a magnetic field around it

iLower Secondary

IG

7.10P	**draw magnetic field patterns for a straight wire, a flat circular coil and a solenoid when each is carrying a current**

74	understand how the potential along a uniform current-carrying wire varies with the distance along it

IAS

99	be able to draw and interpret diagrams using field lines and equipotentials to describe radial and uniform electric fields

IAL

Slide 20

CP0 Add in Physics example

Chelsea Pateman, 2024-05-10T14:18:48.009

Planning

Planning Documents

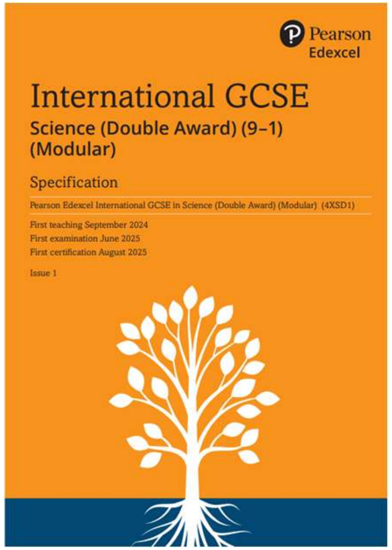
- Specification
- Scheme of Work
- Sample Assessment Material
- Getting Started Guide
- Course Planner

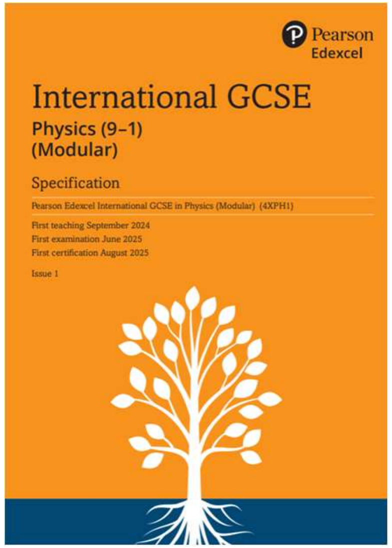
Which of these documents do you already use to plan your teaching? And how?

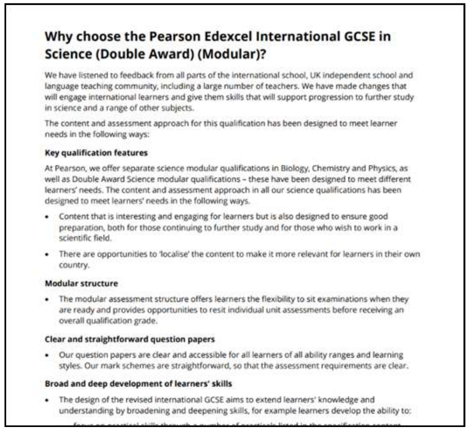
Specification

Key sections to note:

- Why choose Pearson Edexcel International GCSE in (Modular)
- Qualification at a glance
- Assessment information







Why choose the Pearson Edexcel International GCSE in Science (Double Award) (Modular)?

We have listened to feedback from all parts of the international school, UK independent school and language teaching community, including a large number of teachers. We have made changes that will engage international learners and give them skills that will support progression to further study in science and a range of other subjects.

The content and assessment approach for this qualification has been designed to meet learner needs in the following ways:

Key qualification features

At Pearson, we offer separate science modular qualifications in Biology, Chemistry and Physics, as well as Double Award Science modular qualifications – these have been designed to meet different learners' needs. The content and assessment approach in all our science qualifications has been designed to meet learners' needs in the following ways.

- Content that is interesting and engaging for learners but is also designed to ensure good preparation, both for those continuing to further study and for those who wish to work in a scientific field.
- There are opportunities to 'localise' the content to make it more relevant for learners in their own country.

Modular structure

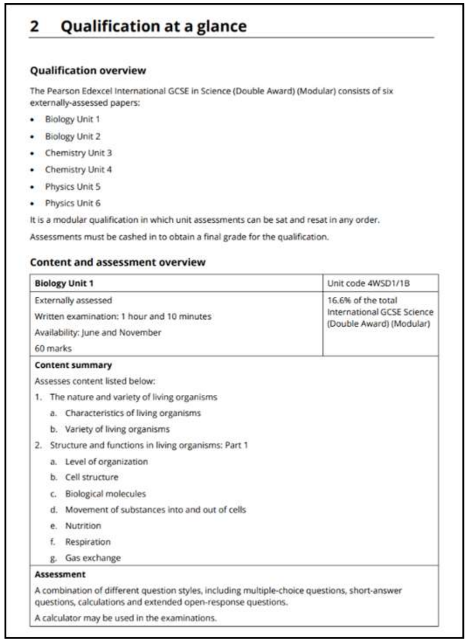
- The modular assessment structure offers learners the flexibility to sit examinations when they are ready and provides opportunities to resit individual unit assessments before receiving an overall qualification grade.

Clear and straightforward question papers

- Our question papers are clear and accessible for all learners of all ability ranges and learning styles. Our mark schemes are straightforward, so that the assessment requirements are clear.

Broad and deep development of learners' skills

- The design of the revised International GCSE aims to extend learners' knowledge and understanding by broadening and deepening skills, for example learners develop the ability to:



2 Qualification at a glance

Qualification overview

The Pearson Edexcel International GCSE in Science (Double Award) (Modular) consists of six externally-assessed papers:

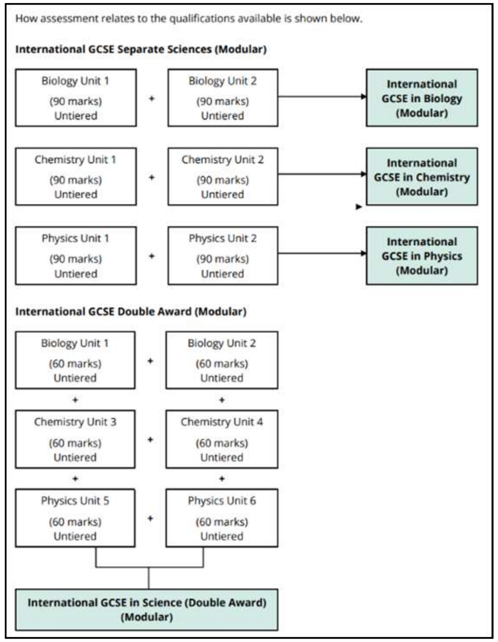
- Biology Unit 1
- Biology Unit 2
- Chemistry Unit 3
- Chemistry Unit 4
- Physics Unit 5
- Physics Unit 6

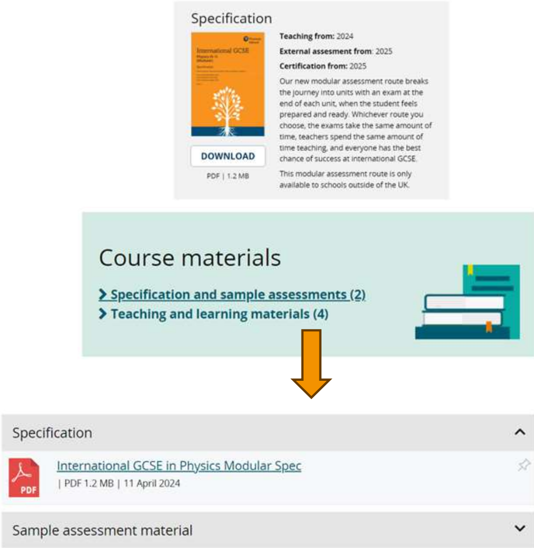
It is a modular qualification in which unit assessments can be sat and resat in any order.

Assessments must be cashed in to obtain a final grade for the qualification.

Content and assessment overview

Biology Unit 1	Unit code 4WSD1/1B
Externally assessed Written examination: 1 hour and 10 minutes Availability: June and November 60 marks	16.6% of the total International GCSE Science (Double Award) (Modular)
Content summary Assesses content listed below: 1. The nature and variety of living organisms a. Characteristics of living organisms b. Variety of living organisms 2. Structure and functions in living organisms: Part 1 a. Level of organization b. Cell structure c. Biological molecules d. Movement of substances into and out of cells e. Nutrition f. Respiration g. Gas exchange	
Assessment A combination of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions. A calculator may be used in the examinations.	





Activity

Think about how you currently use the specification, whether it is linear or modular,

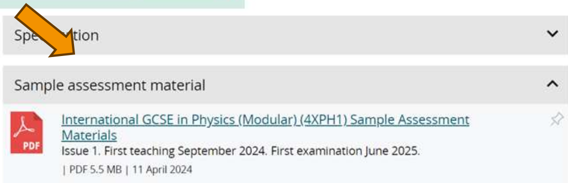
- How do you use the specification in the following areas,
    1. Planning lessons?
    2. Building in revision time?
    3. Support for Mock Exams?

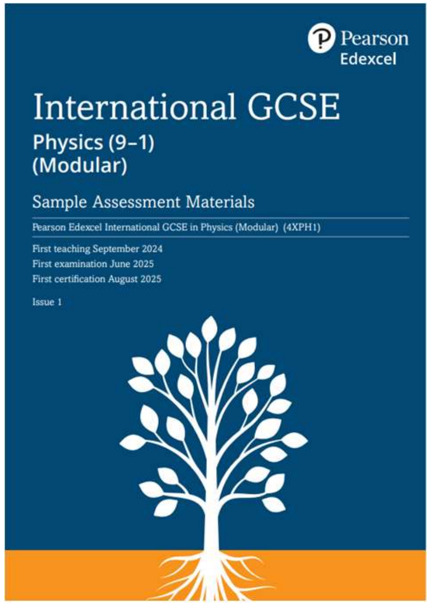
  Are there any other areas of teaching where you would use the specification to support teaching?

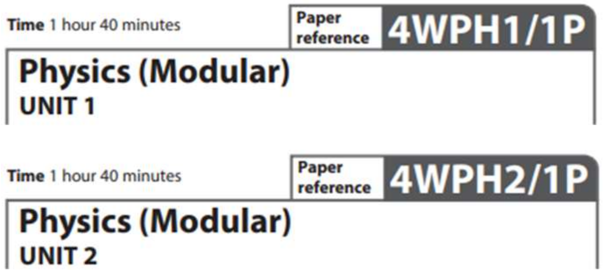
Sample Assessment Material

Separate
- 90 marks
- 1hr 40 mins
- Unit 1 & Unit 2 - each worth 50% of total qual

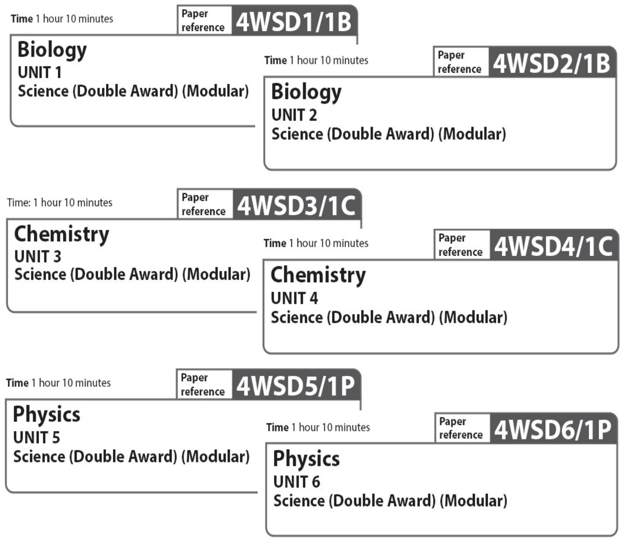
Double Award
- 60 marks
- 1hr 10 mins
- 6 papers in total
- Units 1 & 2 = Bio
- Units 3 & 4 = Chem
- Units 5 & 6 = Physics
- Each paper worth 16.67% of total qual







Common questions between double award and separate



Activity

Think about how you currently use the Sample Assessment Materials, whether it is for the linear or modular,

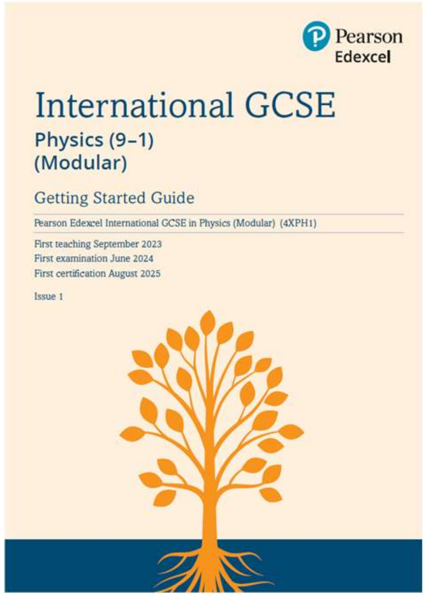
- How do you use the Sample Assessment Material? Think about the following areas and also other aspects of teaching you may use the SAMs for,
  1. Revision
  2. Intervention
  3. Student Progress

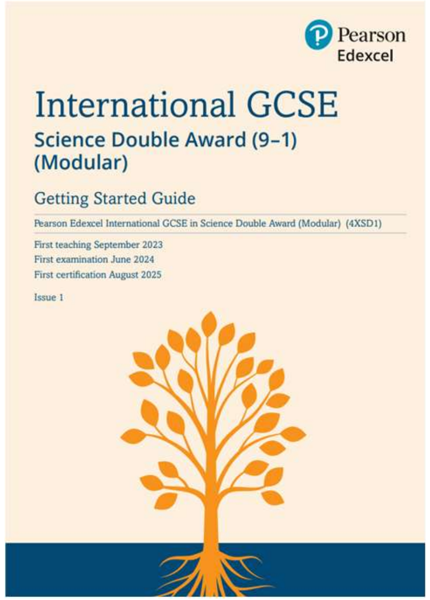
Getting started guides

Great starting point for teachers

Contains:

- Introduction to course
- Key content e.g. physics formulae, core practicals assessed in each unit
- Assessment information
- Key changes





Unit 1	Unit 2
1.5 practical: investigate the motion of everyday objects such as toy cars or tennis balls	*5.17 practical: investigate the refraction of light, using rectangular blocks, semi-circular blocks and triangular prisms*
1.22 practical: investigate how extension varies with applied force for helical springs, metal wires and rubber bands	*5.19 practical: investigate the refractive index of glass, using a glass block*
2.23P practical: investigate how insulating materials can be charged by friction	***5.25P practical: investigate the speed of sound in air***
3.9 practical: investigate thermal energy transfer by conduction, convection and radiation	***5.27P practical: investigate the frequency of a sound wave using an oscilloscope***
4.4 practical: investigate density using direct measurements of mass and volume	*7.6 practical: investigate the magnetic field pattern for a permanent bar magnet and between two bar magnets*
4.11P practical: obtain a temperature–time graph	

Activity

- Thinking about how you might/do use a Getting Started Guide,

    1. What are the aspects that help you the most?
    2. How do you use the getting started guide?
    3. Do you use it to support with planning?

Scheme of work

- Pearson publish an editable scheme of work
- Has a suggested order which is the same as the specification
- The topics can be taught to suit a particular school's needs, and this will depend on individual circumstances
- Has suggested activities for all topics.
- The order and timings will depend if the course is taught over one, two or three years.

Schemes of work

Course materials

> Specification and sample assessments (2)
> Teaching and learning materials (4)

Scheme of work

Scheme of Work | DOCX 309.7 KB | 28 March 2024

Skills acquired explicitly assessed through examination

Potential skills acquired through teaching & delivery

Topic *Subtopic* Lesson title

Specification reference

Suggested activities

Suggested resources

Lesson # or week #

5	**Topic 1: Forces and motion** *a) Units* *b) Movement and position* **Lesson title:** Velocity-time graphs	**Students will be able to:** 1.1 use the following units: kilogram (kg), metre (m), metre/second (m/s), metre/second2 (m/s2), newton (N), second (s), newton per kilogram (N/kg) 1.6 know and use the relationship between acceleration, velocity and time: $acceleration = \frac{Change\ in\ velocity}{time\ taken}$ $a = \frac{(v-u)}{t}$ 1.7 plot and interpret velocity–time graphs.	Activities: • Plot and interpret velocity–time graphs for different situations. • Carry out a range of calculations, including rearranging formulae and converting units. • Match velocity-time graphs to stories about different journeys. Demonstrations: • The Moving man simulation Class practicals: • Velocity-time graphs with a ticker-timer	Pearson Edexcel International GCSE (9–1) Science Double Award Student Book: **pp. 495–501** The moving man simulation Velocity-time graphs with a ticker-timer teacher sheet	Problem solving Analysis Executive function Adaptability	Critical thinking Problem solving Analysis Reasoning Decision making Executive function
31	**Topic 5: Waves** *d) Light and sound* **Lesson title:** Refractive index	**Students will be able to:** 5.18 know and use the relationship between refractive index, angle of incidence and angle of refraction: $n = \frac{\sin i}{\sin r}$ 5.19 *practical: investigate the refractive index of glass, using a glass block.*	Activities: • Complete examples including calculations involving n = sin i/sin r. • Plot a graph of sin (angle of incidence) against sin (angle of refraction) to obtain value of gradient (refractive index). Demonstrations: • Demonstrate apparent depth of an ink spot seen through a measuring cylinder of water, apparent bending of a pencil in beaker of water. • Immersion of Pyrex into suitable oil/glycerol to show apparent 'disappearance' due to equal refractive indices. Class practicals: • Investigate the refractive index of glass, using a glass block.	Pearson Edexcel International GCSE (9–1) Physics Student Book: **pp. 115–116** Pearson Edexcel International GCSE (9–1) Physics Lab Book: **pp. 21–24** Pearson Edexcel International GCSE (9-1) Physics Teaching Hub / Term 4 / Lesson 82: Refractive index Pearson Edexcel International GCSE (9-1) Physics Teaching Hub / Term 4 / Lesson 83: Investigating refractive index Practical video Practical teacher sheet Practical student sheet	Executive function Adaptability	Problem solving Analysis Reasoning Decision making executive function

Consolidation, assessment and feedback lessons (with suggested activities) are also built in

Choose one topic (or part of a topic) from the Physics specification. Plan the order in which you would teach that topic.

Be prepared to share your preferred teaching order, with your reasoning.

Topic 8 is Astrophysics.
Look at the content in the specification.

What student learning activities might you include when teaching this topic?

How do you plan your lessons in physics? Do you, for example, have a common lesson structure as a starting point? Are there any ways you might need to adapt your method(s) of lesson planning to deliver this specification?

Assessment Objectives

What are the assessment objectives?

		International GCSE
AO1	Knowledge and understanding of physics	38–42%
AO2	Application of knowledge and understanding, analysis and evaluation of physics	38–42%
AO3	Experimental skills, analysis and evaluation of data and methods in physics	19–21%
		100%

What are the assessment objectives?

Relationship of assessment objectives to units

Unit number	Assessment objective		
	AO1	**AO2**	**AO3**
Physics Paper 1	23.2–25.7%	23.2–25.7%	11.6–12.8%
Physics Paper 2	14.8–16.3%	14.8–16.3%	7.4–8.2%
Total for International GCSE	38–42%	38–42%	19–21%

What types of question are asked?

Both papers will include a mixture of different question styles, including:

- Multiple-choice questions
- Short-answer questions
- Calculations
- Extended open-response questions

Multiple-choice questions

1 This question is about waves.

(a) (i) Which of these waves is longitudinal?

(1)

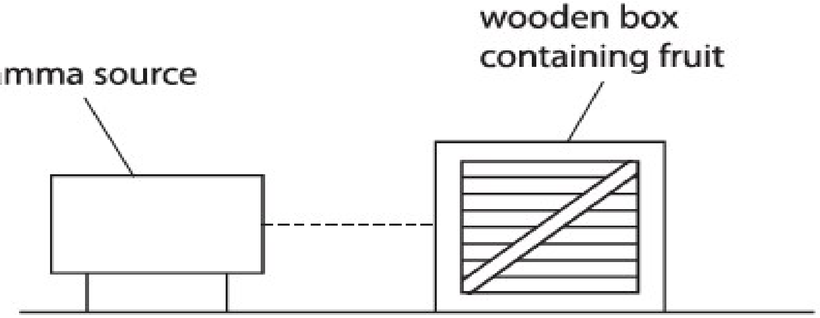
- ☒ **A** infrared
- ☒ **B** radio
- ☒ **C** sound
- ☒ **D** ultraviolet

Short answer questions

This question is about food preservation.

(a) The diagram shows how gamma radiation is used to irradiate fruit stored in a wooden box.

The radiation kills bacteria on the fruit.



Explain why gamma radiation is used instead of alpha radiation to kill bacteria.

(2)

Calculation questions

Voltage in V	Current	Power in W	Energy in J	Colour of lamp
0.0	0.00	0.0	0.0	off
2.0	0.40	0.8	36	red
4.0	0.90	3.6		orange
6.0	1.60	9.6	430	yellow
8.0	2.80	22.4	1000	white

(i) State the unit for current.

(1)

....

(ii) Calculate the missing value of energy for the voltage of 4.0 V.

Give your answer to 2 significant figures.

(2)

energy = ... J

Extended open response (EOR) questions

(b) The ball of dough hits the floor and does not rebound.

Describe the energy transfers taking place from when the dough is dropped to after it has hit the floor.

You should refer to energy stores as well as transfers between energy stores at these stages.

- before the dough is dropped
- just before the dough hits the floor
- after the dough has hit the floor

(4)

....

....

....

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....

....

....

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....

(Total for Question 12 = 7 marks)

What are mark schemes and examiner reports?

Pearson Edexcel

Mark Scheme (Results)

November 2023

Pearson Edexcel International GCSE
In Physics (4PH1) Paper 1P and Science Double Award (4SD0) Paper 1P

Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

November 2023

Pearson Edexcel International GCSE
In Physics (4PH1) Paper 1P and
Science Double Award (4SD0) Paper 1P

Pearson Edexcel

Mark Scheme (Results)

November 2023

Pearson Edexcel International GCSE
In Physics (4PH1) Paper 2P

Pearson Edexcel

Examiners' Report
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November 2023

Pearson Edexcel International GCSE
In Physics (4PH1) Paper 2P

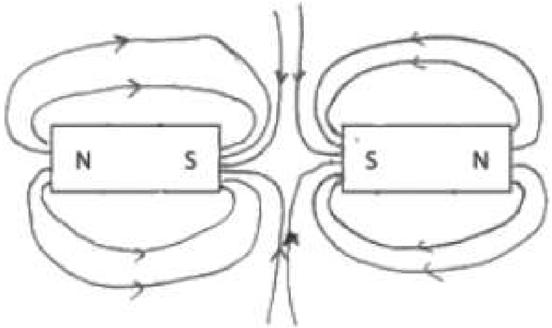
What are mark schemes?

- These are the ‘answers’ to the questions
- They often give a number of alternative answers students might give
- They may also advise the marker of common errors and what to reward and not reward
- Examiners are encouraged to use the mark scheme positively and to look to reward marks for what is there rather than penalise students for what isn’t.

What is in the mark schemes?

Question number	Answer	Notes	Marks
2 (a)	MP1. method to show shape; e.g. use compass(es) use of iron filings / powder MP2. use of plotting compass **to show direction**; MP3. a further method detail; e.g. move compass / multiple compasses in different positions idea of another line or lines added sprinkle iron filings (on to card) tap card (to distribute iron filings)	all marks may be given from diagram allow if compass seen in diagram pointing in a suitable direction allow equivalent materials to card e.g. paper, plastic etc.	3

What is in the mark schemes?

(b)	correctly drawn field line patterns for both bar magnets; correctly drawn field line pattern for region between the magnets; at least three field line directions given from north to south;  	 should show no lines linking south poles not every line needs to have an arrow reject mark if directions contradict 2 marks max. if any lines overlap condone lines touching	3

General marking guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Consider…

Which assessment objectives are being assessed in this part of an exam question?

Assessment objectives and weightings

		International GCSE
AO1	Knowledge and understanding of physics	38–42%
AO2	Application of knowledge and understanding, analysis and evaluation of physics	38–42%
AO3	Experimental skills, analysis and evaluation of data and methods in physics	19–21%
		100%

(iii) Two students use this method to investigate sound from a moving source.

Student A connects a piece of string to the buzzer.

She spins round so that the buzzer moves in a horizontal circular path.

- she spins round at a slow speed
- she then spins round at a high speed

Student B stands several metres away from student A.

The sound heard by student A is different to the sound heard by student B.

Discuss the differences in the sounds heard by student A and student B.

(5)

Activity

How can we encourage students to develop confidence in tackling questions where the context is different from that in which the concept was initially learned?

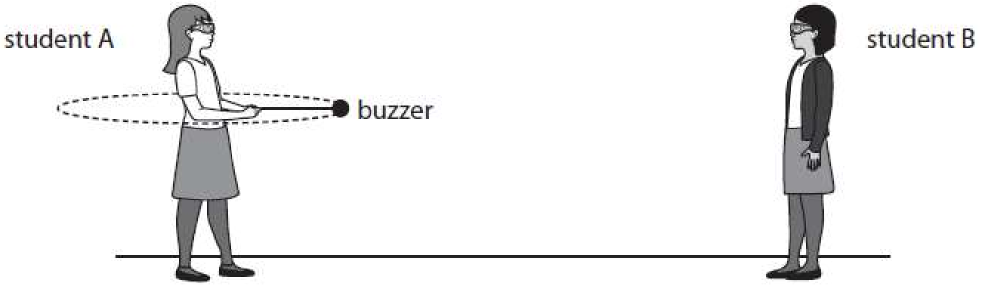
(iii) Two students use this method to investigate sound from a moving source.

Student A connects a piece of string to the buzzer.

She spins round so that the buzzer moves in a horizontal circular path.

- she spins round at a slow speed
- she then spins round at a high speed

Student B stands several metres away from student A.



The sound heard by student A is different to the sound heard by student B.

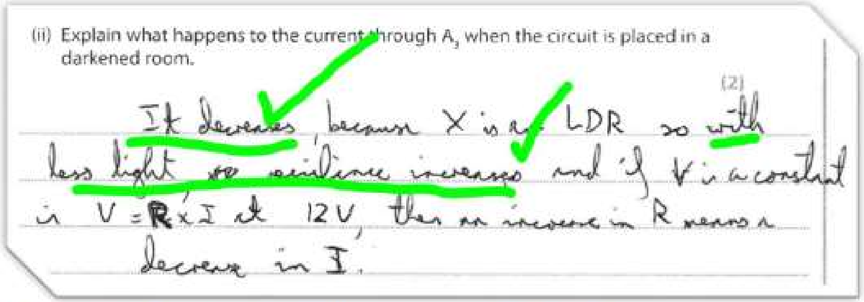
Discuss the differences in the sounds heard by student A and student B.

(5)

Exemplars

A lot more students found **Q1cii** more difficult (nearly 40% failed to get this right). It is harder than the rest of the question and is therefore placed at the end. As an explanation, it needs a 2-stage answer: a statement of what does happen when the circuit (with an LDR) is placed in a darkened room AND a reason why. The two stages can be given in reverse order e.g. a statement about the resistance AND a consequent effect on the current.

This is a very full correct answer

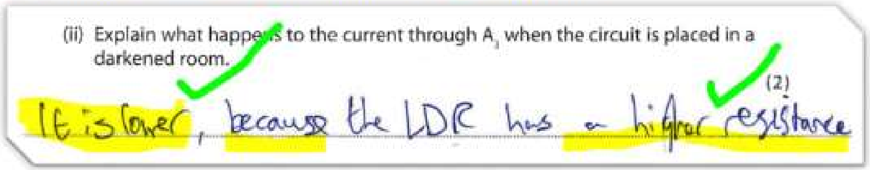


(ii) Explain what happens to the current through A_1 when the circuit is placed in a darkened room.

(2)

It decreases, because X is a LDR so with less light the resistance increases and if V is a constant in V = R x I at 12V, then an increase in R means a decrease in I.

Not all answers have to be this full....this also got full marks



(ii) Explain what happens to the current through A_1 when the circuit is placed in a darkened room.

(2)

It is lower, because the LDR has a higher resistance

Inevitably, many students got the current increasing and resistance decreasing and so lost the marks.

Exemplar activity

Here is an example, from the 'Exemplars' document, of a part-question (requiring the plotting of a bar chart from data supplied in the question)… and the related mark scheme below

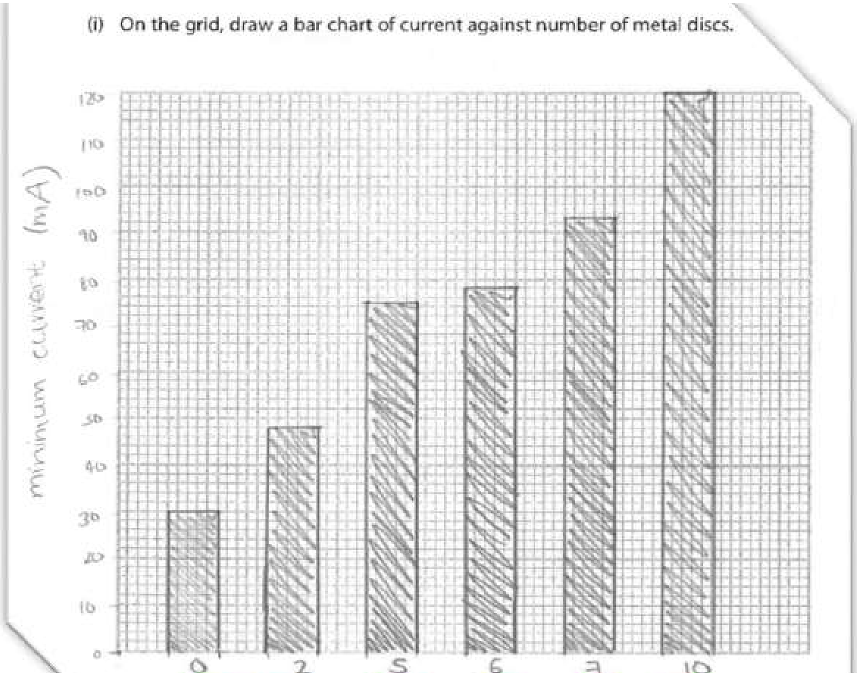
(b) The student's results are given in the table.

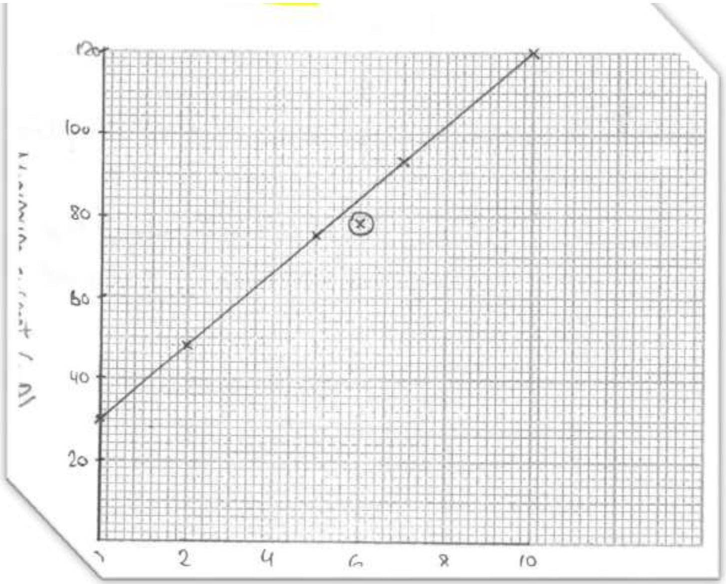
Number of metal discs	Minimum current / mA
0	30
2	48
5	75
6	78
7	93

Answer	Mark
• Scale on the y-axis (1) • Both axes labelled with variable and unit (1) • Plotted (1) • Bars drawn (1)	4

Exemplars Activity:
- what mark would you give?

(i) On the grid, draw a bar chart of current against number of metal discs.

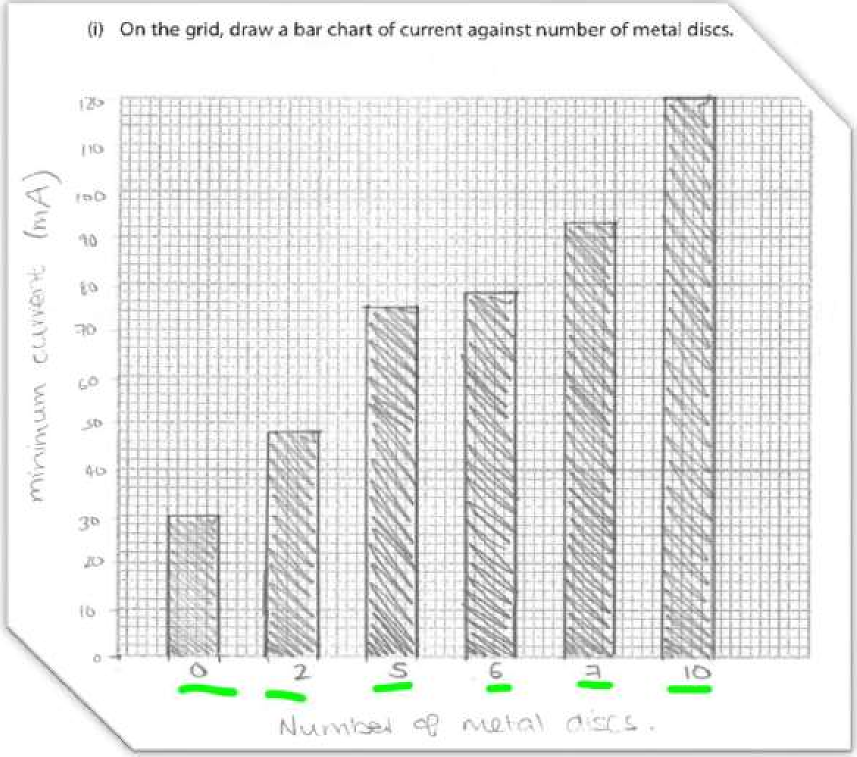




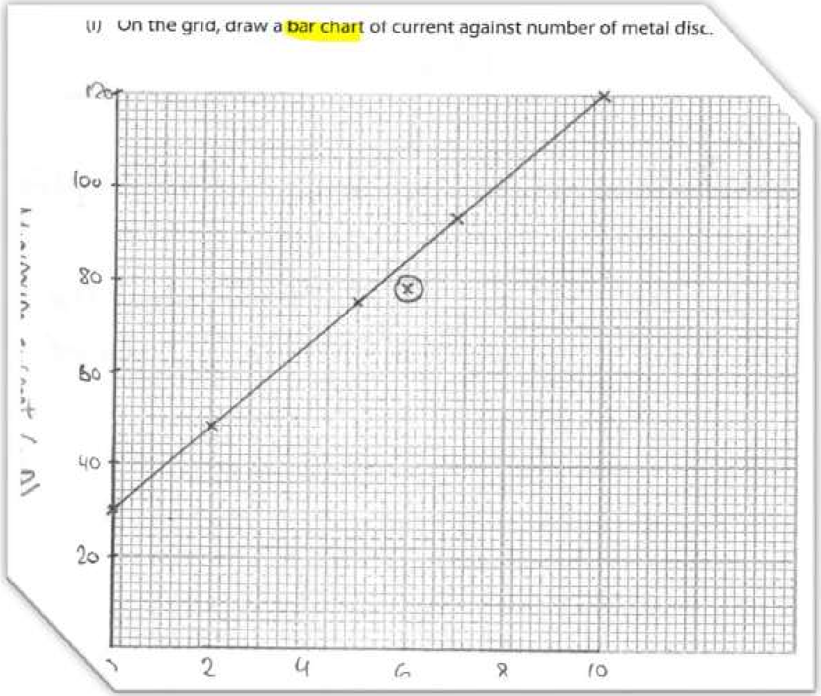
Answer	Mark
• Scale on the y-axis (1) • Both axes labelled with variable and unit (1) • Plotted (1) • Bars drawn (1)	4

Exemplars

This student gave a non-linear scale and so lost a mark.



This student got the scales correct but attempted a scatter-gram or line graph and omitted a label. Two marks only awarded.



Exemplars

Question 6

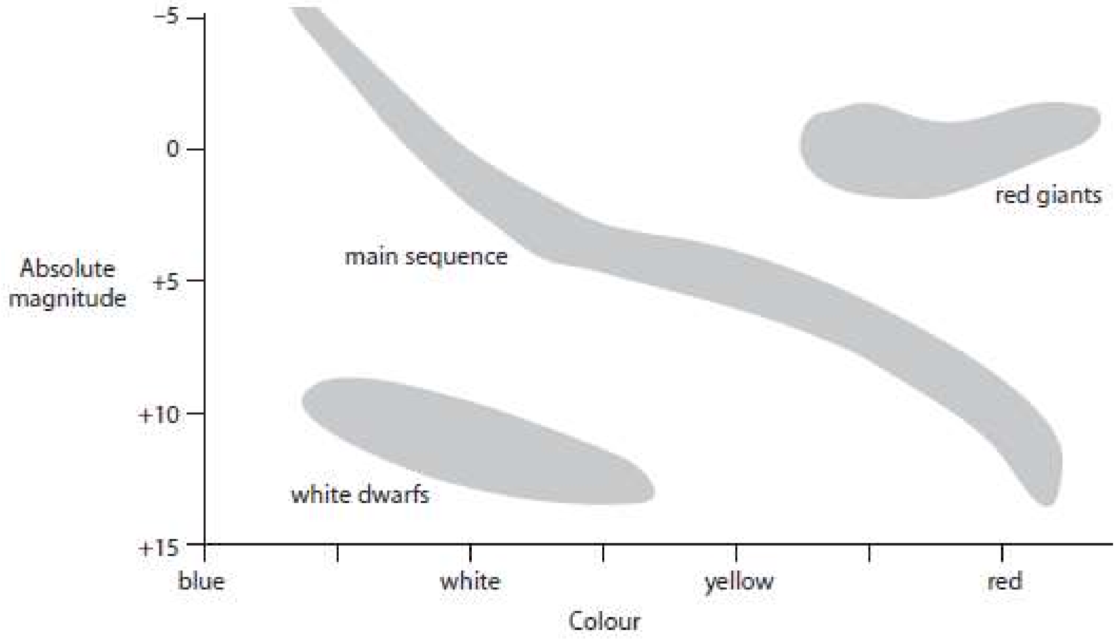
This question is designed to test Assessment Objective 3 (**AO3**) which is about experimental skills, analysis and evaluation of data and methods in physics which is 20% of the marks available. It is set in the context of an electromagnet and the question mixes content and skills.

Almost 25% of students could not name the independent variable in **Q6ai**. This just needs practice: the variable that you choose to vary is the independent variable, the one that you have to alter or measure as a result is the dependent variable.

In **Q6aii**, almost half of the students got it wrong, with the most common confusion being that iron conducts electricity.

Many students made simple errors when drawing the bar chart.

4 A Hertzsprung-Russell diagram shows how different astronomical objects may be classified according to their colour and absolute magnitude.



The diagram shows three stages of evolution for stars of similar mass to the Sun.

Describe the evolution of stars of similar mass to the Sun.

You should refer to the temperature and brightness of the stars in your answer.

(6)

Question number	Answer	Notes	Marks
4	a description including any six from: MP1. nebula collapses / forms protostar; MP2. **temperature / brightness** of nebula / protostar increases; MP3. (when temperature becomes hot enough) fusion starts and star becomes main sequence; MP4. **brightness / temperature** of main sequence star depends on its mass; MP5. (when hydrogen runs out) main sequence star becomes red giant; MP6. red giants are **brighter** (than main sequence); MP7. red giants (surfaces) are **cooler** (than most main sequence stars); MP8. red giant becomes white dwarf; MP9. white dwarfs are **less bright** (than red giant / main sequence stars); MP10. white dwarfs are **hotter** (than red giant / most main sequence stars);	 allow 'contracts' allow 'size' for mass	6

Principal examiner’s feedback on Question 4

Q04 discriminated well between candidates and this new area of the specification had clearly been well-learned by most candidates. Most responses communicated the correct stages in the evolution of stars of similar mass to the Sun and also in the correct order.

Those candidates who commented on the changes in temperature and brightness often gained marks for describing the correct changes in temperature, but gave incorrect statements about the brightness.

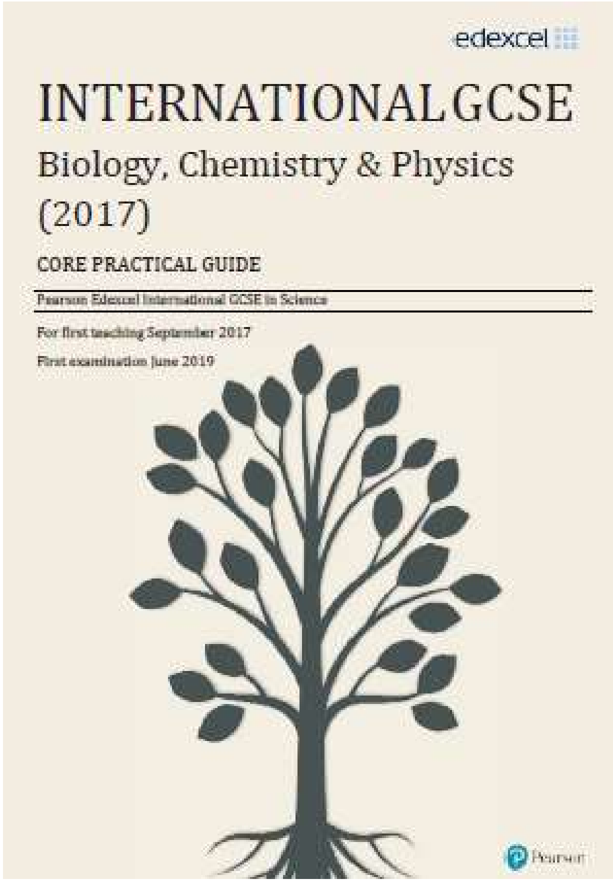
Candidates were expected to interpret this information from the absolute magnitude scale of the Hertzsprung-Russell diagram and many candidates incorrectly assumed that a more negative absolute magnitude corresponded to a dimmer star.

The best candidates produced well-structured responses that presented all the evolutionary stages in the correct order, whilst commenting on the changes in temperature and brightness between each stage.

Assessment of practical work

Assessment of Practical Work

- As mentioned earlier, all of the assessment of practical work is in the written exams (about 20% of the total marks) – there is no practical exam, or 'assessed practicals' in this course.
- This increases the need (over what may have happened in some older specifications) for learning during practical lessons to be planned carefully so that students develop the skills necessary to tackle those exam questions.
- The *Core Practical Guide* is an invaluable tool to aid this area of learning.



Assessment of Practical Work

The core practical guide includes, for each of the core practicals:

- Links to the relevant specification content
- Introducing the practical (guidance on how to carry out the experiment)
- Questions you could ask to enhance learning
- Skills that are covered in the practical
- Maths skills
- One or more exam questions related to the core practical, with mark scheme and examiner comments

Planning practicals

When planning practicals, give lots of guidance for weaker or younger students

"The independent variable is ________"

"Two variables I need to control are _________"

Give them the hypothesis as a gap fill.

"As the light intensity ________, the rate of oxygen production by the pond weed will ________"

"Circle any anomalous values"

"Two sources of error are _________"

"To make the investigation more reliable I need to ______"

Planning practicals

For stronger and students who are familiar with planning, gradually reduce the scaffolding:

"Plan an investigation into ___. Explain how you will ensure that the results are reliable and enable you to make a valid conclusion."

"Evaluate your results and the strength of your conclusion."

If they have progressed through the years, by the time they reach International AS and A Level, they will understand how to plan, carry out and analyse.

Example: Core practical 7 - Frequency of Sound

3.27 P Core practical: Investigate the frequency of a sound wave using an oscilloscope

Links to the specification content

3.24 P	**Know that the frequency range for human hearing is 20–20 000 Hz**
3.25 P	**Practical: investigate the speed of sound in air**
3.26 P	**Understand how an oscilloscope and microphone can be used to display a sound wave**
3.28 P	**Understand how the pitch of a sound relates to the frequency of vibration of the source**
3.29 P	**Understand how the loudness of a sound relates to the amplitude of vibration of the source**

Example: Core practical 7 - Frequency of Sound

Introducing the practical

The best input signals come from either skilful whistling, a signal generator connected to a loudspeaker or, more recently, a tone from an app on a suitable smart phone.

The microphone should be connected to the y-input of an oscilloscope.

Both time base and y-amplification can be altered for the same signal to get between 3 and 10 complete oscillations on the display.

Once the time base and y-amplification are fixed, the frequency and amplitude of the sound source can be altered.

The number of divisions for several periods can be measured and an average calculated. This average is then multiplied by the time-base to give the period.

The frequency is then given by 1/period.

The period is likely to be in milliseconds, so care must be taken to complete the conversion correctly.

Further information on this experiment here on the Practical Physics website.

Example: Core practical 7 - Frequency of Sound

Questions you could ask to enhance learning and focus your students on important aspects of the practical:

- Can you demonstrate that the source of sound is still emitting even though you cannot hear it?
- What is the maximum and minimum frequencies that can be heard by members of the class? Why is that range different for the teacher and the students?
- Why are those maximum and minimum frequencies different for different people?

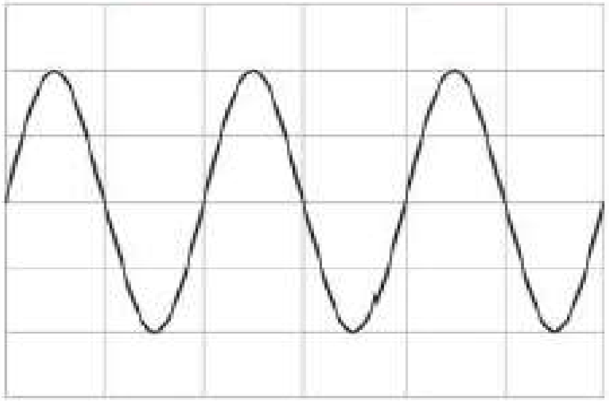
Skills that are covered in the practical:

- Use of an oscilloscope
- Use of a signal generator and loudspeaker to produce a sound
- Appreciation of orders of magnitude

Example: Core practical 7 - Frequency of Sound

A microphone is connected to an oscilloscope to display a sound wave.

The diagram shows the trace on the oscilloscope screen.



The oscilloscope settings are:

Y direction: 1 square = 1 V

X direction: 1 square = 0.001 s

(a)(i) How many time periods are shown on the trace? **(1)**

(ii) What is the frequency of the sound wave? **(2)**

Frequency = ______________________ Hz

Example: Core practical 7 - Frequency of Sound

Question number	Answer	Accept	Reject	Marks
(a) (i)	3;	Three /3.0		1
(ii)	0.002 (s) / 2<u>m</u>s ; 500 (Hz) / 0.5<u>k</u>Hz	0.001 ecf only if 2ai=6 correct answer without working for 2 marks 1000 ecf only if 2ai =6		2

In a)i), students commonly misunderstand and suggest that there are six complete oscillations. In part a)ii), error carried forward was applied if part i) was incorrect. The basic skills of reading the number of divisions and converting that to a time period (and hence the frequency) are tested.

How to prepare students in practical skills

- The best way to develop experimental skills is to embed practical investigations in teaching or theory. The development of knowledge and experimental skills can then happen together, leading to secure acquisition of both knowledge and skills.

- Our practical investigations are embedded within *Section 2: Physics content* as specification points in italics. The skills developed through these and other practicals will be assessed through written examinations. There are also practical activities in the Appendix.

Experimental skills

(b)	**Magnetism**
Students should:	
6.2	know that magnets repel and attract other magnets and attract magnetic substances
6.3	describe the properties of magnetically hard and soft materials
6.4	understand the term magnetic field line
6.5	know that magnetism is induced in some materials when they are placed in a magnetic field
6.6	*practical: investigate the magnetic field pattern for a permanent bar magnet and between two bar magnets*
6.7	describe how to use two permanent magnets to produce a uniform magnetic field pattern

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

- solve problems set in a practical context
- apply scientific knowledge and understanding in questions with a practical context
- devise and plan investigations, using scientific knowledge and understanding when selecting appropriate techniques
- demonstrate or describe appropriate experimental and investigative methods, including safe and skilful practical techniques
- make observations and measurements with appropriate precision, record these methodically and present them in appropriate ways
- identify independent, dependent and control variables
- use scientific knowledge and understanding to analyse and interpret data to draw conclusions from experimental activities that are consistent with the evidence
- communicate the findings from experimental activities, using appropriate technical language, relevant calculations and graphs
- assess the reliability of an experimental activity
- evaluate data and methods, taking into account factors that affect accuracy and validity.

What are the implications of the way in which practical skills (working scientifically skills) are assessed for teaching and learning – especially when we are doing core practicals or other practical activities?

Exam technique

The exam paper

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Show all the steps in any calculations and state the units.
- Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Information

- The total mark for this paper is 110.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Exam technique

Preparation

- Effective exam techniques need to be practised by students using past papers or part-papers; perhaps ‘home-made’ papers using Exam Wizard tailored to suit the exercise or focused on the particular technique being practised.
- Give students such a paper to practice how to access it.
- Give students mark schemes so they can learn what is expected.
- Having a ‘go to’ strategy, a starting point, builds confidence and reduces the stress of ‘what do I do first’.

Exam strategy – one way to tackle a paper

- Look through the whole paper first, underlining (or, better, highlighting) the command words in each question
- Decide which question to do first – start with the question(s) you feel most confident with, which is not necessarily question 1.
- Read question carefully - don't repeat stem in your answer
- Don't give up on a whole question if you find one section of the question difficult – move on to the next part.
- The same strategy holds for whole questions you find difficult –move on
- Come back to missed questions and parts of questions when you have picked off all the 'low-hanging fruit'.

Activity question

What strategies do you share with your students that you find effective?

Walking-talking mocks

- Students sit in the same exam room where they will do their exam, preferably in the same seats (it can be done in the classroom, but not always as effective in building confidence in exam conditions)
- Students are given an exam paper which is as close to being like the real thing as possible (i.e. exam writing booklet if relevant)
- Students are literally walked through every question on the paper – the person leading the session talks them through the smallest steps, such as underlining key words, how to plan, things to remember etc.
- You might focus on a particular area – such as mathematical questions, or questions based on devising a practical investigation
- Students then write their responses in timed conditions

What our examiners have noticed

- Most students were able to recall the equations and usually they handled the related calculations well. Successful candidates were competent in performing quantitative work, could recall relevant formulae and rearrange these formulae to obtain the correct answer.
- Students who gave the best practical descriptions showed evidence of undertaking all the required practicals themselves and could produce detailed, coherent methods whilst recalling the relevant results of these experiments. Less successful candidates had limited experience
or could not recall information from the required practical tasks. They also overlooked the importance of the command words being used.
- Successful candidates could recall facts whilst applying their understanding to new and complex situations.
- Responses to the longer questions showed that the less able students tend to struggle when assembling a logical description.

Exam Insights
from Linear Physics (9-1)

Key messages from past examines' reports

Application of knowledge to new contexts (both theoretical and practical) is a key skill – practising this by attempting past paper questions which assess AO2 is worthwhile.

Questions which require an evaluation response are challenging and worth practising. For the longer, discussion and evaluate style questions, candidates should be careful to explore all aspects of data thoroughly and use their own knowledge to add explanations.

'Describe' and 'explain' are confused by some candidates – it is important that they understand the meaning of command words.

it is important that candidates have a thorough knowledge of all the core practicals listed in the specification.

Mathematical skills are a key part of the assessment – candidates should show all their working as they will gain credit for this even if their final answer is incorrect.

It is important to always use scientific terminology accurately.

Further advice from examiners to candidates 1

- Ensure that you read the question carefully and include sufficient points to gain full credit.
- Include as many points as there are marks available in the question.
- Make sure you have practised calculations, given in the appendix of the specification, and that you understand and know how to apply formulae and always include all your working.
- Take care when drawing diagrams to add labels and draw standard apparatus accurately.
- Write in detail and use correct and precise biological terminology.
- Revise practical work to help in questions about unfamiliar or novel practical procedures.

Further advice from examiners to candidates 2

- Make sure you know and understand all of the terms in the specification.
- Always be able to identify the variables in experiments.
- Ensure in experiment design questions to give the independent variable and the range you are going to use, the dependent variable, how you are going to measure it and the control variables and explain how these will be controlled.
- Always read through your responses and ensure that what you have written makes sense and answers the question fully.
- Learn units and use them accurately, for example for resistance.

Challenging questions from June 2024 papers

State what is meant by the term voltage (1)

the difference in energy transfer between two points on a circuit or across a component

The potential difference across a circuit. Energy per unit charge.

Would these answers gain the mark?

State what is meant by the term voltage (1)

Question 7 (c)(i)

Less than a quarter of all candidates knew the correct definition of the term *voltage*.

energy (transferred) per unit charge (passed);	allow V = **E**/**Q** only if all terms defined allow work done for energy transferred allow coulomb for unit charge

Q5c (iii)

Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

Q5c (iii)

Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

acceleration decreases (to zero); with any two from: • spring extension decreases; • force from spring / elastic force / upwards force decreases; • weight (of object) stays the same; • resultant force decreases (to zero);	ignore decelerates allow spring becomes less stretched ignore other irrelevant forces e.g. upthrust, air resistance etc. allow forces are balanced if clear that this only applies when the mass is at its initial resting position	3

Q5c (iii)

Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

The magnitude will change as ~~at its original~~ from the instant the object ~~rest~~ is released it has ~~etesl eh elastic gravitational~~ kinetic energy being transperred ~~potential~~ elastically then once it retuns to its resting point it looses some kinetic energy and gains gravitational potential through an ~~elastic~~ elastic store.

Q5c (iii)

Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

Magnitude decreases as energy ~~is~~ ~~the~~ ~~wh~~ decreases due to air resistance so the spring has less elastic potential energy and the weight stays the same so the upward resultant force of magnitude decreases.

Q5c (iii)

Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

~~The elastic potential when the object is pulled turns into kinetic energy.~~ When the object returns to its initial resting position the acceleration will decrease until the forces acting on it balance out.

What are the implications for teaching and learning arising from the feedback from the Examiners' Reports?

Taxonomy (Command words)

Command words – what they are and why they are important

- Every question should have a command word.
- It is an instruction to candidates, telling them what we want them to write.
- It is critical that candidates know what each command word means so that they can answer the question effectively.
- Many candidates do not fully understand what each command word means – 'describe' and 'explain' are often confused with each other.
- All our qualifications in International GCSE sciences now use a common taxonomy for command words.
- These can be found in an appendix at the back of the specification.
- Students can expect a range of command words across the demand range of the exam paper.

Appendix 4: Command word taxonomy

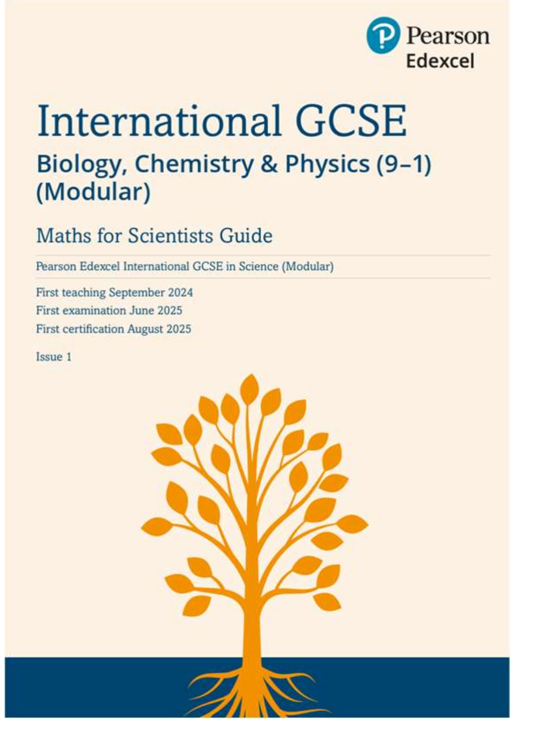
The following table lists the command words used in the external assessments.

Command word	Definition
Add/Label	Requires the addition or labelling of a stimulus material given in the question, for example labelling a diagram or adding units to a table.
Calculate	Obtain a numerical answer, showing relevant working.
Comment on	Requires the synthesis of a number of variables from data/information to form a judgement.
Complete	Requires the completion of a table/diagram.
Deduce	Draw/reach conclusion(s) from the information provided.
Describe	To give an account of something. Statements in the response need to be developed, as they are often linked but **do not** need to include a justification or reason.
Determine	The answer must have an element that is quantitative from the stimulus provided, or must show how the answer can be reached quantitatively. To gain maximum marks, there must be a quantitative element to the answer.
Design	Plan or invent a procedure from existing principles/ideas.
Discuss	• Identify the issue/situation/problem/ argument that is being assessed within the question. • Explore all aspects of an issue/situation/problem/ argument. • Investigate the issue/situation etc. by reasoning or argument.
Draw	Produce a diagram either using a ruler or freehand.
Estimate	Find an approximate value, number or quantity from a diagram/given data or through a calculation.
Evaluate	Review information (e.g. data, methods) then bring it together to form a conclusion, drawing on evidence including strengths, weaknesses, alternative actions, relevant data or information. Come to a supported judgement of a subject's quality and relate it to its context.
Explain	An explanation requires a justification/exemplification of a point. The answer must contain some element of reasoning/justification – this can include mathematical explanations.
Give/State/Name	All of these command words are really synonyms. They generally all require recall of one or more pieces of information.
Give a reason/reasons	When a statement has been made and the requirement is only to give the reason(s) why.
Identify	Usually requires some key information to be selected from a given stimulus/resource.
Justify	Give evidence to support (either the statement given in the question or an earlier answer).
Plot	Produce a graph by marking points accurately on a grid from data that is provided and then draw a line of best fit through these points. A suitable scale and appropriately labelled axes must be included if these are not provided in the question.
Predict	Give an expected result.
Show that	Verify the statement given in the question.
Sketch	Produce a freehand drawing. For a graph, this would need a line and labelled axes with important features indicated. The axes are not scaled.
State what is meant by	When the meaning of a term is expected but there are different ways for how these can be described.
Suggest	Use your knowledge to propose a solution to a problem in a novel context.
Verb proceeding a command word	
Analyse the data/graph to explain	Examine the data/graph in detail to provide an explanation.
Multiple choice questions	
What, Why, Which	Direct command words used for multiple-choice questions.

Maths Skills

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



Appendix 3: Mathematical skills

The table below identifies the mathematical skills that will be developed and assessed throughout this qualification. These are not explicitly referenced in the content. Details of the mathematical skills in other science subjects are given for reference.

		B	C	P
1	**Arithmetic and numerical computation**			
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	✓		✓
E	Use calculators to handle sin x and $\sin^{-1} x$, where x is expressed in degrees			✓
2	**Handling data**			
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	✓	✓	✓
3	**Algebra**			
A	Understand and use the symbols $<$, $>$, $\propto$, $\sim$		✓	✓
B	Change the subject of an equation	✓	✓	✓
C	Substitute numerical values into algebraic equations using appropriate units for physical quantities	✓	✓	✓
D	Solve simple algebraic equations	✓	✓	✓
4	**Graphs**			
A	Translate information between graphical and numerical form	✓	✓	✓
B	Understand that $y = mx + c$ represents a linear relationship		✓	✓
C	Plot two variables (discrete and continuous) from experimental or other data	✓	✓	✓
D	Determine the slope and intercept of a linear graph	✓	✓	✓
E	Understand, draw and use the slope of a tangent to a curve as a measure of rate of change		✓	✓
F	Understand the physical significance of area between a curve and the x-axis, and measure it by counting squares as appropriate			✓
5	**Geometry and trigonometry**			
A	Use angular measures in degrees			✓
B	Visualise and represent 2D and 3D objects, including two dimensional representations of 3D objects			✓
C	Calculate areas of triangles and rectangles, surface areas and volumes of cubes	✓		✓

Mathematical skills which can be assessed in both units

Arithmetic and numerical computation (physics)

- Recognise and use numbers in decimal form
- Recognise and use numbers in standard form
- Use ratios, fractions, percentages, powers and roots
- Make estimates of the results of simple calculations, without using a calculator
- Use calculators to handle sin x and sin-1 x, where x is expressed in degrees

Mathematical skills which can be assessed in both units

Handling data (physics)

- Use an appropriate number of significant figures
- Understand and find the arithmetic mean (average)
- Construct and interpret bar charts
- Construct and interpret frequency tables, diagrams and histograms
- Understand simple probability
- Understand the terms mode and median
- Use a scatter diagram to identify a pattern or trend between two variables
- Make order of magnitude calculations

Mathematical skills which can be assessed in both units

Graphs (physics)

- Understand that $y = mx + c$ represents a linear relationship
- Translate information between graphical and numerical form
- Plot two variables (discrete and continuous) from experimental or other data
- Determine the slope and intercept of a linear graph
- Understand, draw and use the slope of a tangent to a curve as a measure of rate of change
- Understand the physical significance of area between a curve and the x-axis, and measure it by counting squares as appropriate

Mathematical skills which can be assessed in both units

Algebra and geometry (physics)

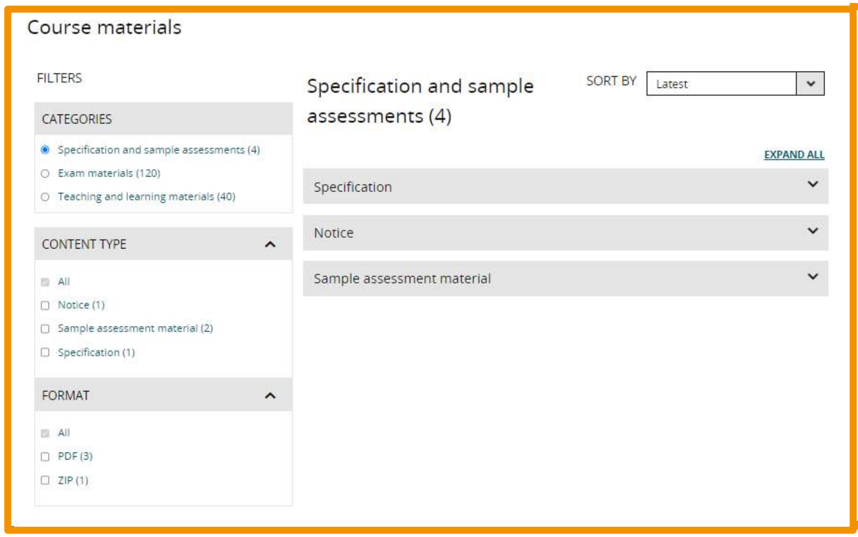
- Understand and use the symbols <, >, $\propto$, ~
- Change the subject of an equation
- Substitute numerical values into algebraic equations using appropriate units for physical quantities
- Solve simple algebraic equations
- Use angular measures in degrees
- Visualise and represent 2D and 3D objects, including 2D representations of 3D objects
- Calculate areas of triangles and rectangles, surface areas and volumes of cubes

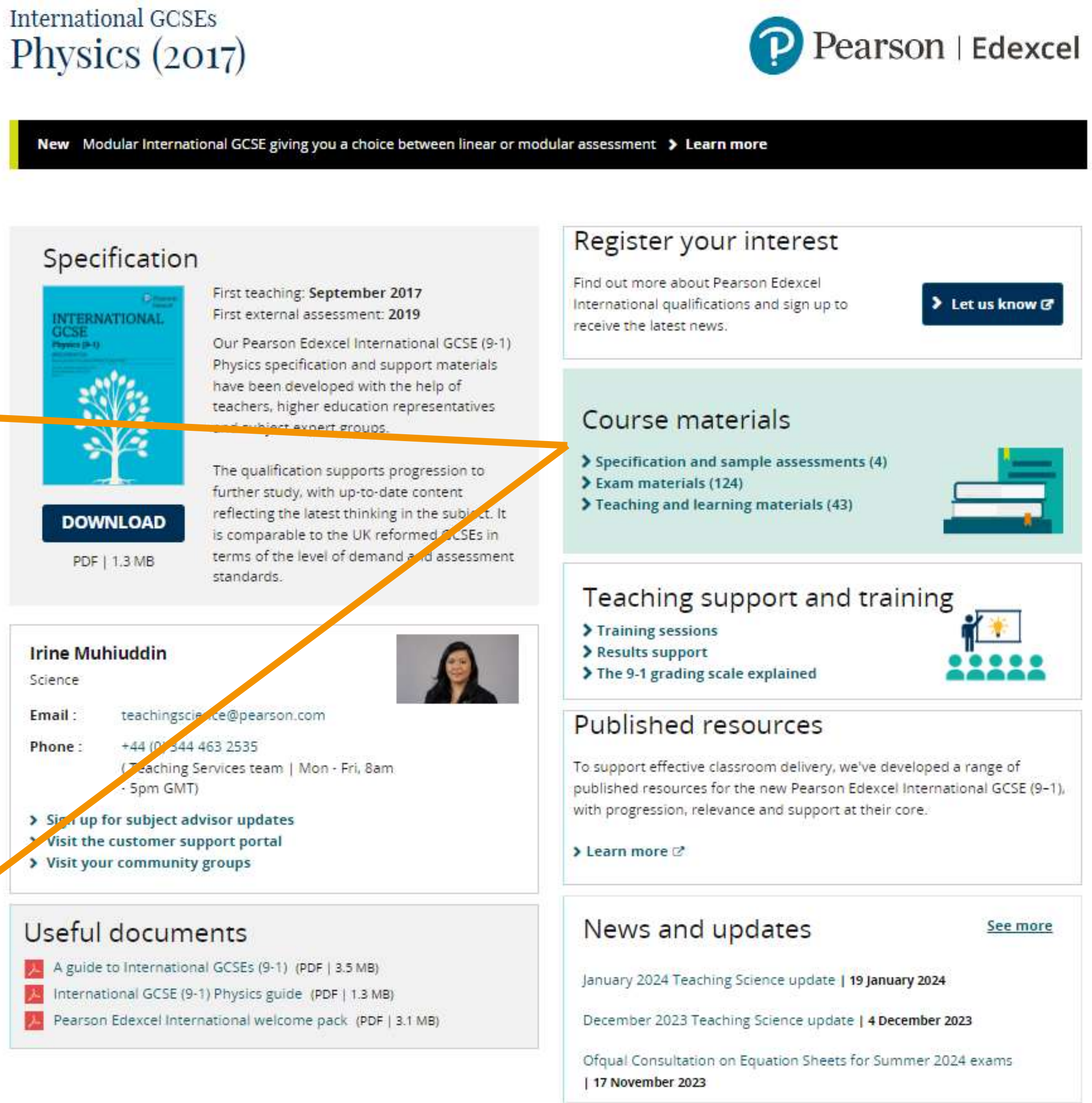
Support and resources

Support for you at every stage

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

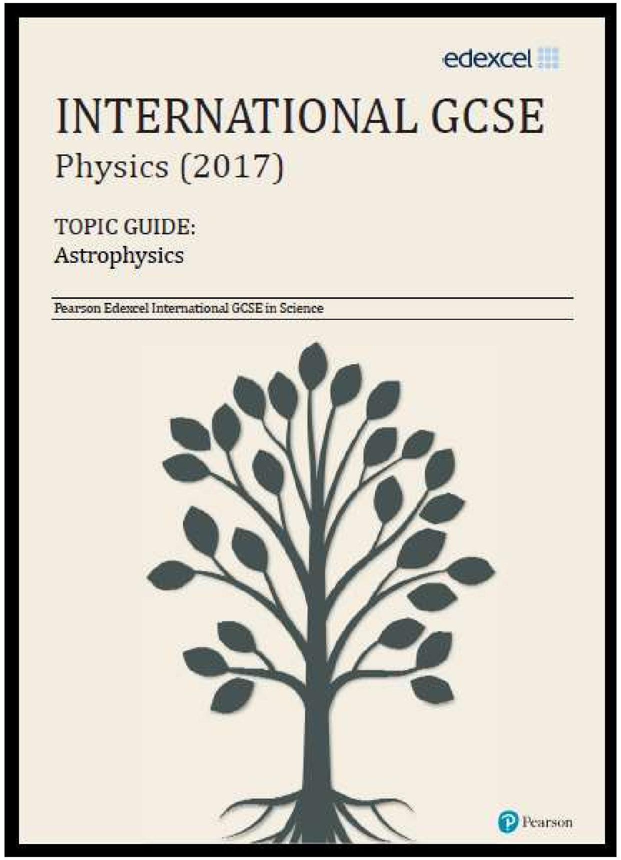
Teaching and Learning Materials online





Support available

A number of websites contain downloadable resources to support the teaching of astronomical topics within a number of GCSE and A Level courses e.g.



Association for Astronomy Education

The AAE - www.aae.org.uk/

NASA

www.nasa.gov/audience/foreducators/index.html

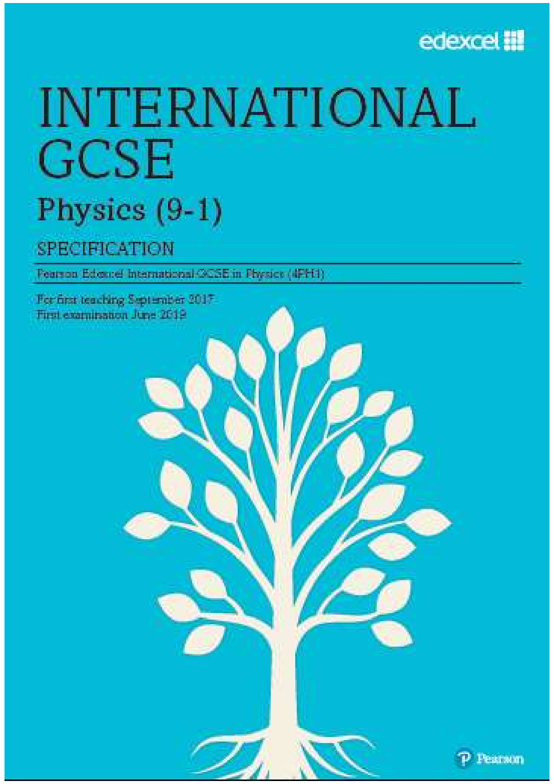
RAS website and leaflets

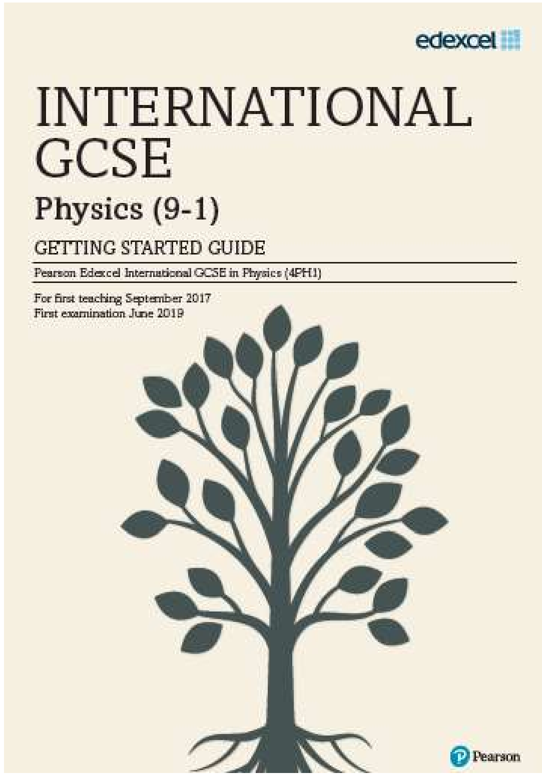
Leaflet on Gravity relates directly to this topic.

www.ras.org.uk/education-and-careers/for-schools-and-teachers

How do I make sure I cover all the content?

- Specification
- Lesson plans
- Schemes of work
- Year planners





Two-year course planner

Two- year course planner

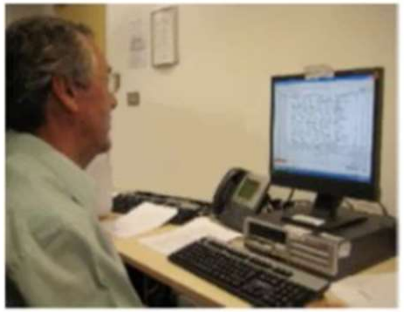
Week no.	Hours per topic	Lesson content and topic	Sub-topics covered
1	1: Forces and motion 20 hours	1.3, 1.4, 1.5	b) Movement and position
2		1.6 – 1.10	b) Movement and position
3		1.11 – 1.17	c) Forces, movement, shape and momentum
4		1.18, 1.19, 1.20, 1.21,	c) Forces, movement, shape and momentum
5		**1.25P**, **1.26P**, **1.27P**	c) Forces, movement, shape and momentum
6		*consolidation and assessment*	b) Movement and position c) Forces, movement, shape and momentum
7		**1.28P**, **1.29P**	c) Forces, movement, shape and momentum
8		**1.30P**, **1.31P**, **1.32P**, **1.33P**	c) Forces, movement, shape and momentum
9		1.22 – 1.24	c) Forces, movement, shape and momentum
10		*consolidation and assessment*	c) Forces, movement, shape and momentum
11	2: Electricity 14 hours	2.2 – 2.6	b) Mains electricity
12		2.7 – 2.12	c) Energy and voltage in circuits
13		2.13 – 2.21	c) Energy and voltage in circuits
14		**2.22P**, **2.23P**, **2.24P**, **2.25P**, **2.26P**, **2.27P**, **2.28P**	d) Electric charge
15		*consolidation and assessment*	b) Mains electricity c) Energy and voltage in circuits d) Electric charge
16	3: Waves 20 hours	3.2 – 3.6	b) Properties of waves
17		3.7 – 3.9	b) Properties of waves
18		3.10 – 3.13	c) The electromagnetic spectrum
19		3.14 – 3.16	d) Light and sound
20		*consolidation and assessment*	b) Properties of waves c) The electromagnetic spectrum d) Light and sound
21		3.17 – 3.19	d) Light and sound
22		3.20 – 3.22	d) Light and sound
23		3.23, **3.24P**, **3.25P**	d) Light and sound
24		**3.26P**, **3.27P**, **3.28P**, **3.29P**	d) Light and sound
25		*consolidation and assessment*	d) Light and sound

Support for Exam preparation and post results

ResultsPlus

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

ResultsPlus



1. Student takes exam on paper

2. Exam papers scanned

3. Examiners mark papers online

4. Performance reports shared

examWizard

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

Access to Script (ATS) Online Portal

Access to Scripts (ATS) is a free online portal which allows teachers to immediately access electronically marked exam papers

Provides enhanced transparency and

- Offers transparent approach to marking process
- Provides better understanding of marking before requests for enquiries about results are made
- Provides excellent aid for teaching and preparing other cohorts for examinations by helping you to evaluate a student's performance on particular questions in relation to what they have been taught.

Available instantly from results day for all our examination series, for a defined window, you can view and download scripts which have been marked online free of charge from our Self-Service Portal.

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

Additional Paid Resource

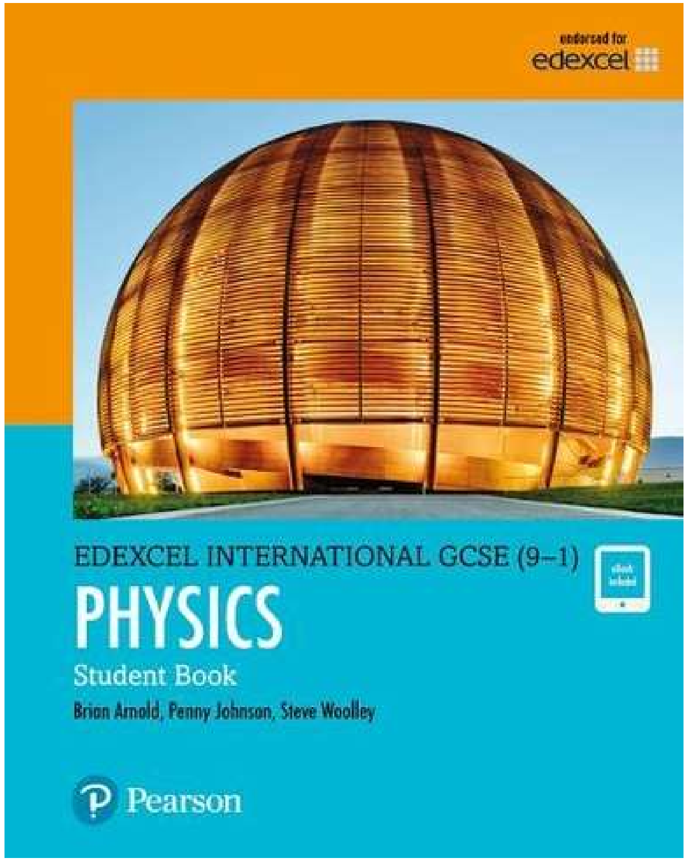
Resource	Planning, teaching and learning	Exam preparation and assessment	Results support
Curriculum-matched Student Books with ActiveBooks	✓	✓	
Teaching Hubs	✓	✓	

Pearson published resources

Student Book
Edexcel International GCSE (9-1): Physics
Student Book
ISBN: 9780435185275

For more information and access
to samples visit:

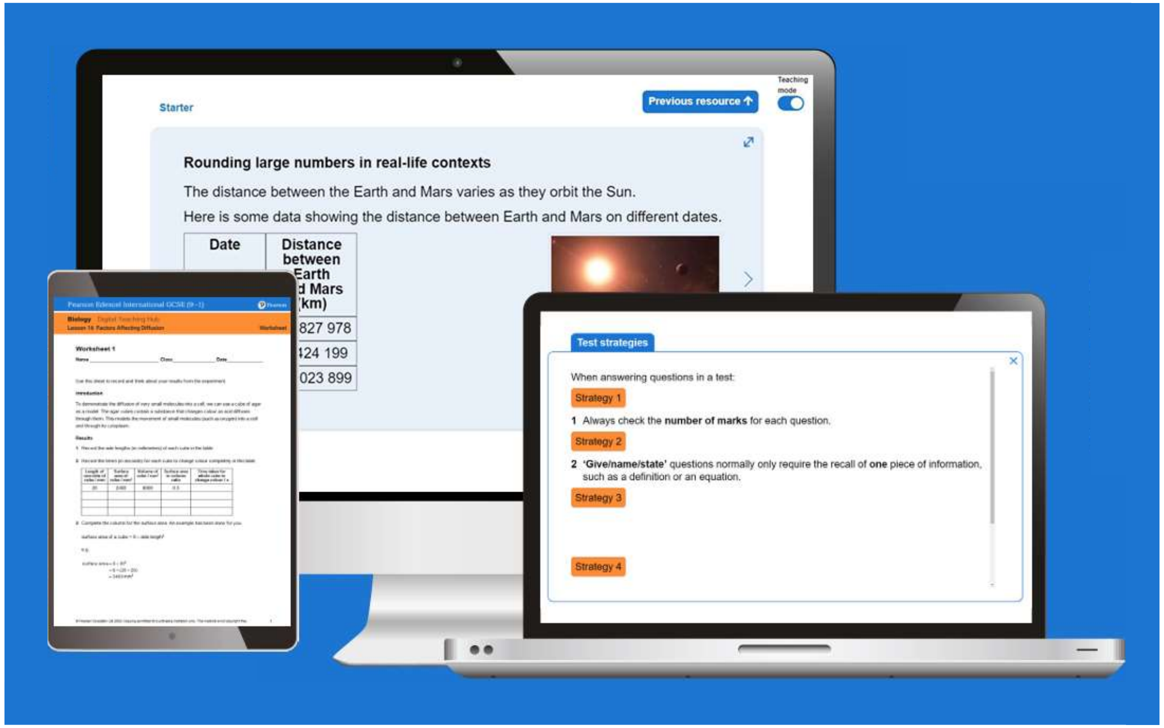
www.pearson.com/international-schools



International GCSE (9–1)

TeachingHubs

The new Teaching Hubs provide fully comprehensive planning and front-of-class guidance, along with exam-preparation resources and CPD support, to help you deliver your International GCSE lessons to a high standard – whether you are a specialist or non-specialist teacher.



Contact your dedicated Subject Advisor

If you have any questions, please do book time in with the dedicated subject advisor.

Tim Lawrence

Telephone: +44 (0) 344 463 2535

qualifications.pearson.com/contactus

Email: teachingscience@pearson.com

Booking some time in with the subject advisor, please see calendar availability here.

Next steps

Think of THREE things you might try or do differently as a result of ideas you've discussed today.

(You won't be asked to share these.)

Share in the chat box ONE thing you would like to do as soon as you return to your classroom or department.

Questions