Pearson Edexcel

International GCSE Science

Understanding Assessment and Improving Delivery in International GCSE Physics

4PH1-251F1

Pearson Edexcel

Welcome to today's event

- Introduction to your trainer
- Housekeeping
- What's in your pack?
- How today's training is structured

Getting to know you

- Who are you and which school do you teach at?
- How long have you been teaching the IAL Physics specification?
- Are you currently an examiner?

Agenda

- Introductions
- Session 1 two assessment routes, writing papers, AO, Activity 1
- BREAK
- Session 2 question styles, MS, AO1, Activity 2, AO2, Activity 3 and 4
- LUNCH
- Session 3 AO3, Activity 5 and 6
- BREAK
- Session 4 Improving Achievement in the examination room, Activity 7
- Support from Pearson/ feedback / depart

Aims & Objectives

- Be introduced to the differences in Linear and Modular assessment routes,
- Be introduced to writing examination papers,
- be introduced to the idea of assessment objectives: what are they and why they are used when writing examination papers,
- analyse recent question papers and learn which types of question match the different assessment objectives,
- investigate different assessment objectives, considering how questions in these areas have been answered by looking at feedback from previous exam series,
- discuss strategies for teaching to try and make sure students can access questions targeting different assessment objectives,
- review the support Pearson offers for the qualification,
- network, discuss best practice and share ideas with other teachers.

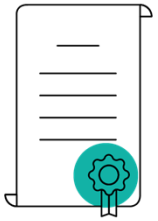
Welcome to Pearson

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

Understanding the two Assessment Routes

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.

Teaching in a Modular Way

You *may* want to change the way you teach the International GCSE Physics Specification Content if you take the Modular route for assessment.

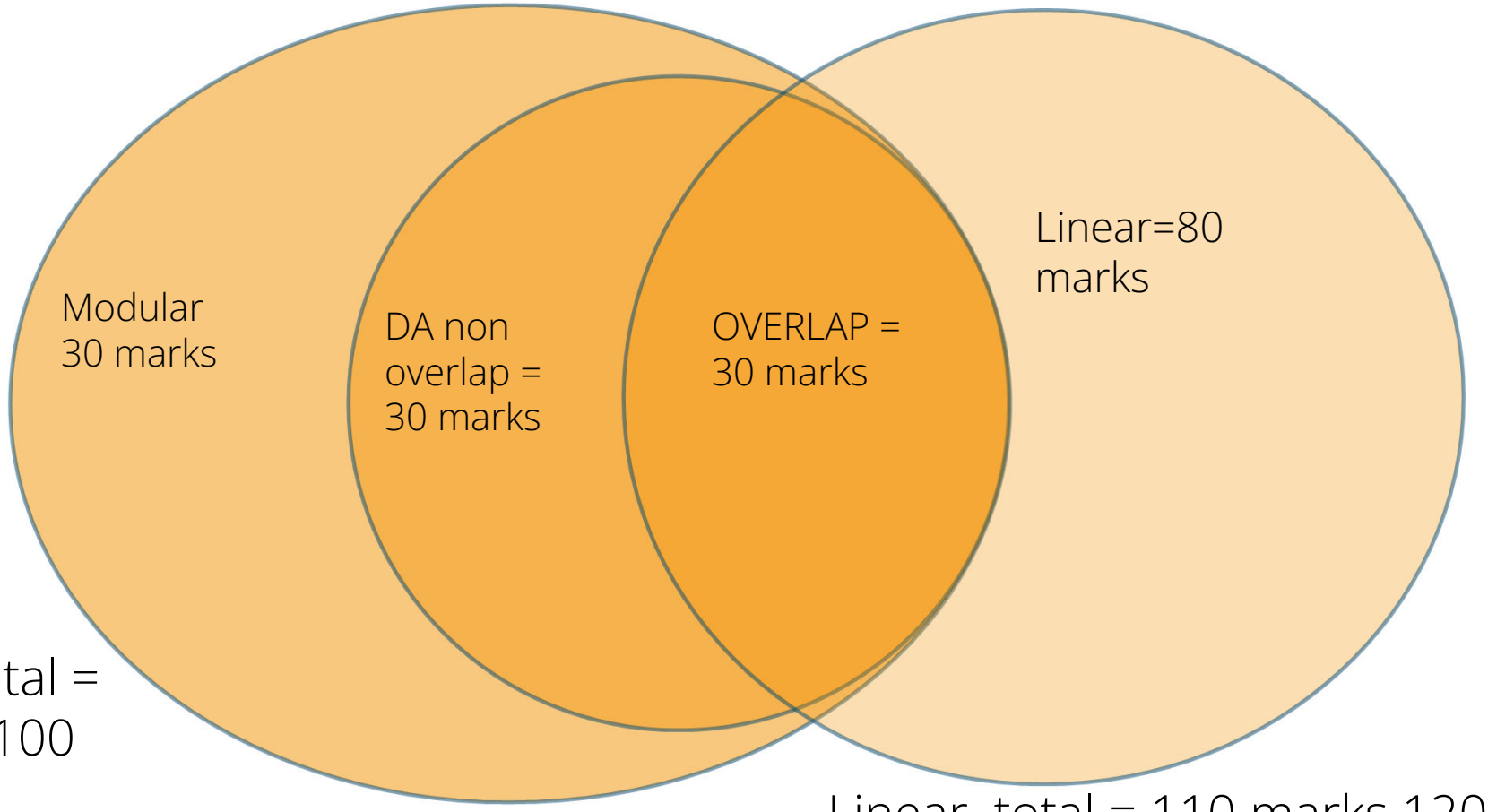
- To support your planning and teaching of the course, we have course planners, editable schemes of work and Getting Started Guide.
- First teaching for International GCSE Physics (Modular) was September 2024
- First assessment of International GCSE Physics (Modular) is May/June 2025

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.

<table>
<tr><th colspan="3">Paper 1</th></tr>
<tr><th>Linear</th><th colspan="2">Modular</th></tr>
<tr><td>2-hour written examination.</td><td colspan="2">1-hour-40-minute written examination.</td></tr>
<tr><td>The total number of marks is 110, 61.1% of the total International GCSE.</td><td colspan="2">The total number of marks if 90, 50% of the total International GCSE.</td></tr>
<tr><td>Content summary
Assesses core content that is NOT in bold and does not have a ‘P’ 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</td><td>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</td><td>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</td></tr>
</table>

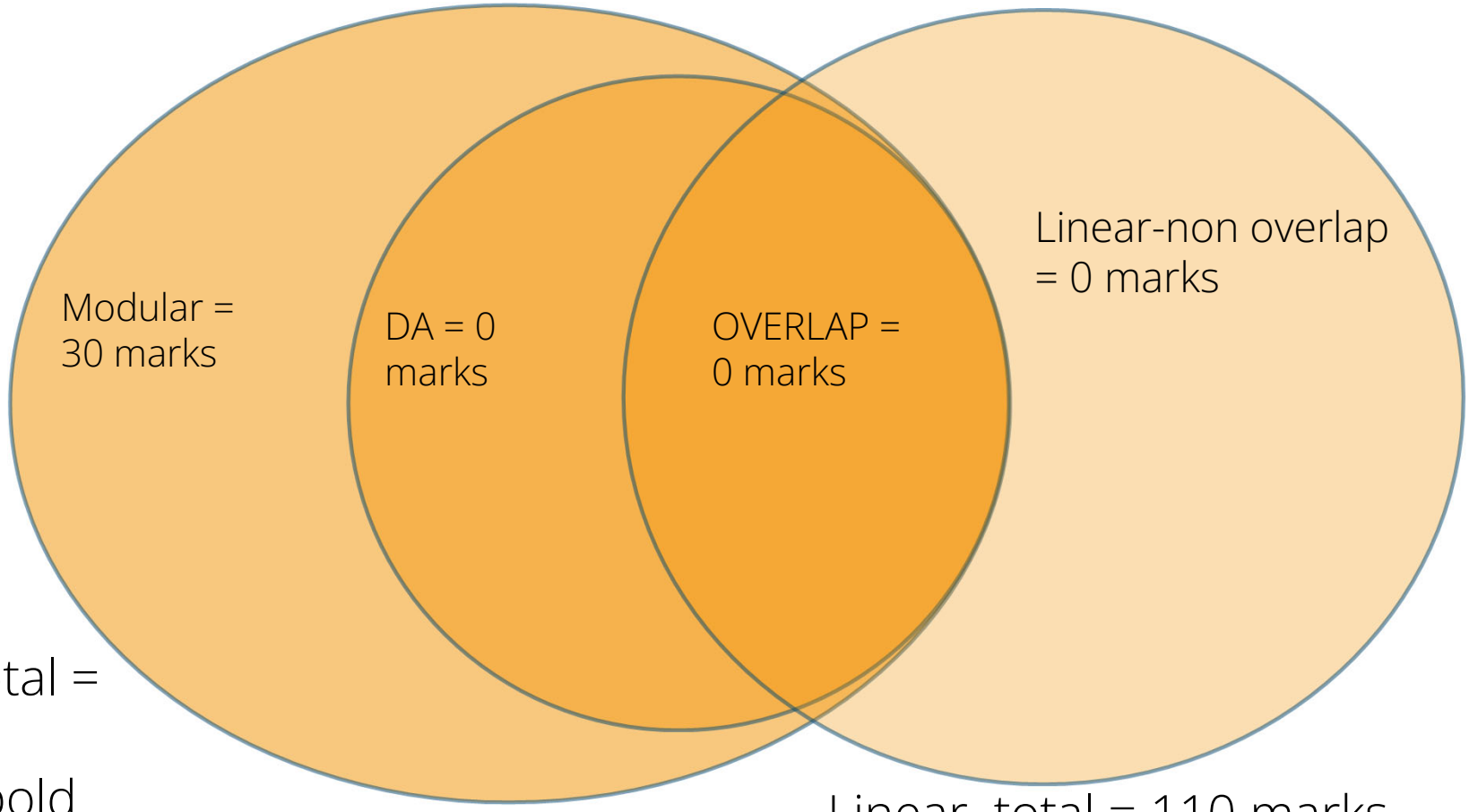
Relationship between content and exam papers Paper 1



Modular total = 90 marks 100 mins

Linear total = 110 marks 120 mins

BOLD content only Paper 1



Modular total =
90 marks
30 marks bold

Linear total = 110 marks
0 marks bold

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.

<table>
<tr><th colspan="3">Paper 2</th></tr>
<tr><th>Linear</th><th colspan="2">Modular</th></tr>
<tr><td>1-hour-15-minute written examination.</td><td colspan="2">1-hour-40-minute written examination.</td></tr>
<tr><td>The total number of marks is 70, 38.9% of the total International GCSE.</td><td colspan="2">The total number of marks if 90, 50% of the total International GCSE.</td></tr>
<tr><td>Content summary
Assesses all the content including content that is in bold and has a ‘P’ prefix.

Questions may come from any topic area across the specification. Bold statements cover some topics in greater depth.</td><td>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</td><td>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</td></tr>
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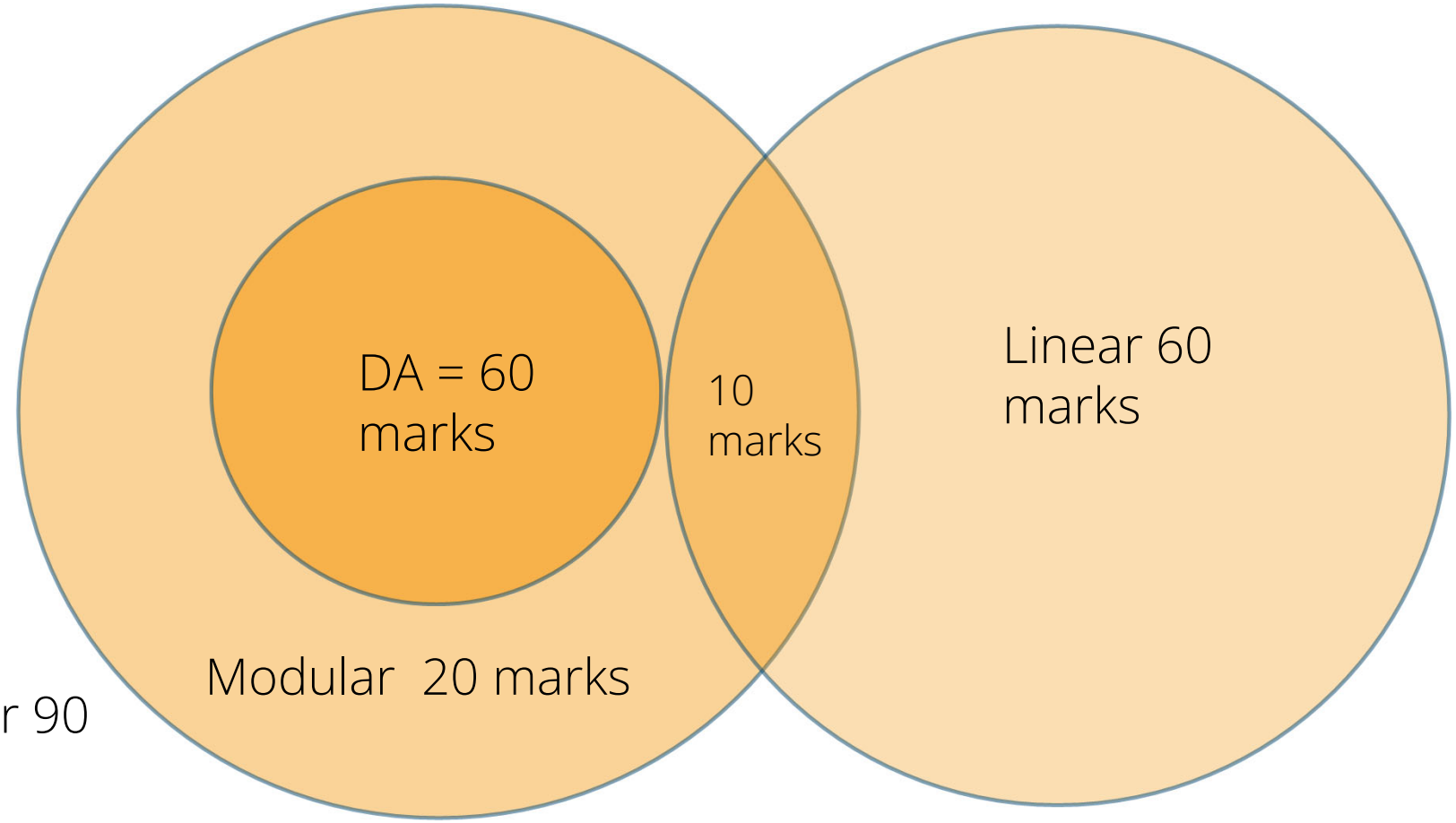
Paper 2

Linear total = 70 marks
75 mins



Modular 90 marks
100mins

What are the consequences?

1. The style of assessment is the same on ALL papers.
2. There will be comparability between the 2 different assessment routes.
3. All papers will test all three Assessment Objectives.
4. Bold content is NOT harder.
5. All specifications have the same final grades 1 to 9 with 9 being the highest.
6. You can use any past paper from International GCSE linear as a resource.

Re-sits for Modular International GCSE

- Learners can re-sit any unit irrespective of whether the qualification is to be cashed in.
- If a learner resits a unit more than once, only the better of the two most recent attempts of that unit will be available for aggregation to a qualification grade.
- Results of units will be held in Pearson Edexcel's unit bank for as many years as this specification remains available.
- Once International GCSE in Physics (Modular) has been certificated, all unit results are deemed to be used up at that level. These results cannot be used again towards a further award of the same qualification at the same level.

Understanding how the qualification and assessments are devised

Explanation of the Assessment Objectives (AO)

- Writing papers and MS
- What are the Assessment Objectives (AOs)?
- Why they are used
- Balance of AOs in the papers

How do we write papers?

- Content writers…..one per paper
- Every specification point is tested at least once in the lifetime of the specification
- The balance of AOs is constant 2:2:1 for AO1, AO2 and AO3
- Questions targeted at low demand, medium demand and high demand which correspond to grades 1-3, 4-6, 7-9
- Each paper is ramped in difficulty, and each question too!
- 30% maths!
- Long 10 + stage process with lots of people having an input.

Why assessment objectives are used

- A range of skills are assessed in every paper
- Consistency between the two papers in terms of accessibility and level of demand
- Similar difficulty of assessment achieved across all examination series over time
- Same assessment objectives and distribution of assessment objectives used across all sciences in the International GCSE suite of qualifications

The Assessment Objectives

AO1	Knowledge and understanding of physics
AO2	Application of knowledge and understanding, analysis and evaluation of physics
AO3	Experimental skills, analysis and evaluation of data and methods in physics

All assessment objectives are assessed in both Paper 1 and Paper 2.

Each paper targets the same distribution of these assessment objectives.

Activity 1– Identifying AOs

Look at the 4PH1 1P paper in your delegate pack.

This paper was sat by candidates in June 2024.

Task 1

•Look at Q1. Determine which assessment objectives are being targeted in each part of this question.

Task 2

•Look at Q5. Determine which assessment objectives are being targeted in each part of this question.

Task 3

•Look at Q10. Determine which assessment objectives are being targeted in each part of this question.

Task 4

•Look at Q12. Determine which assessment objectives are being targeted in each part of this question

Activity 1 Feedback/Answers

Q1 - All AO1 all questions match spec points directly.

Q5 – Q5a, AO1, Q5bi AO1 & 2, Q5bii AO2, Q5biii AO3

Q10 – Q10a AO2, Q10bi AO3, Q10bii AO3, Q10biii AO3, Q10ci-iii AO3

Q12 – All AO2

Percentage balance for each Assessment Objective in **all** papers

		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%

Contribution of assessment objectives to both papers (Modular)

Paper number	Assessment objective		
	AO1	AO2	AO3
Physics Unit 1	19–21%	19–21%	9.5–10.5%
Physics Unit 2	19–21%	19–21%	9.5–10.5%
Total for International GCSE (Modular)	38–42%	38–42%	19–21%

Contribution of assessment objectives to both papers (Linear)

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%

Question types, mark schemes and other support materials

Question Types for all IGCSE Physics exams

- Multiple Choice
- Short response questions
- Drawing diagrams or adding to an already drawn diagram
- Calculations
- Extended open response questions

All questions are points based

What are mark schemes and examiner reports?

- 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.

General marking guidance, this is printed in *every* Mark Scheme

- 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.

What is in the mark schemes?

We give

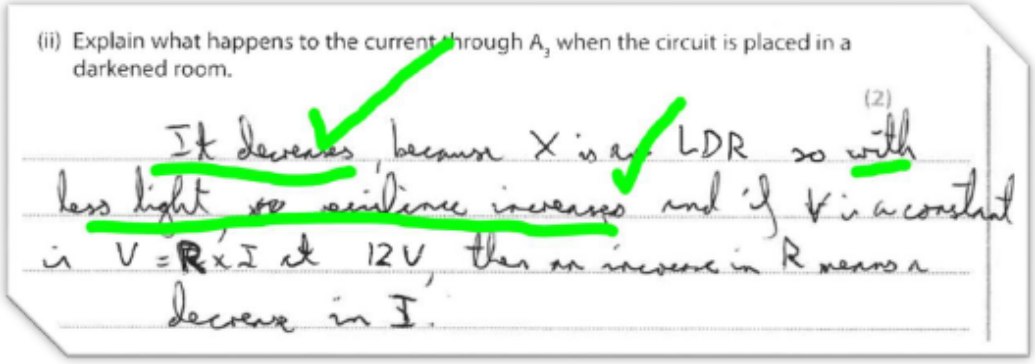
- ✓ correct answer in the main Answer column
- ✓ show where a mark is awarded with a semi-colon (;)
- ✓ use allow/accept for alternative answers where we can award a mark
- ✓ use condone for an answer we we do not like but accept
- ✓ use ignore for a neutral answer, not worth a mark
- ✓ use reject for an answer which loses a mark
- ✓ award marks for the stages of the calculation
- ✓ give an example of the calculation
- ✓ give the evaluation to the same number of SF as in the question
- ✓ allow answers to more SF or correctly rounded responses
- ✓ use brackets() to show what is not needed
- ✓ use {a/b} to show that a or b must be seen in the answer
- ✓ allow reverse argument RA
- ✓ remove a mark for power of ten errors (POT)

Question number	Answer	Notes	Marks
3 (a)	{skin / eye / tissue} burns;	allow damage to surface cells, skin damage reject skin cancer, cell mutation, sunburn	1
(b) (i)	any two from: • both electromagnetic waves; • both transfer energy; • both transverse waves; • both are non-ionising; • both can travel through vacuum; • both have same speed (in a vacuum);	allow EM waves allow both part of EM spectrum allow both can be reflected / refracted / diffracted	2
(ii)	• infrared has longer/higher wavelength; • infrared has lower frequency;	allow RA allow RA condone infrared has lower energy	2
(c)	substitution into speed = distance / time; rearrangement; evaluation; e.g. $3.0 \times 10^8 = 1.5$ / time time = $1.5 / 3.0 \times 10^8$ (time =) 5.0×10^{-9} (s)	-1 for POT error allow 5×10^{-9} (s), 0.000 000 005 (s)	3
(d)	black is a better/good **absorber** (of infrared radiation); idea that more energy/heat transferred to black car (in the same time);	allow RA e.g. white is a poor **absorber** allow white is a better/good **reflector** (of infrared radiation) allow RA e.g. less energy/heat transferred to white car allow black car warms up quicker black car absorbs more energy/heat scores 2 marks	2

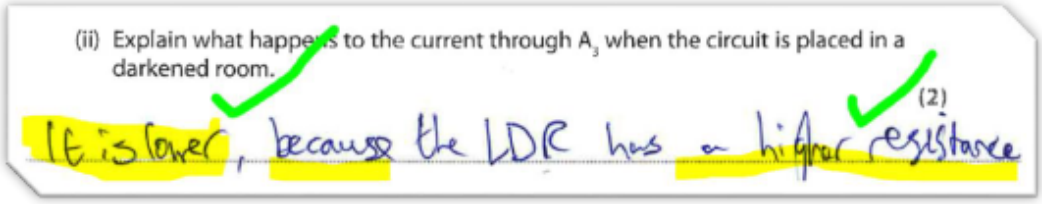
Practicing marking to our standard, exemplars with commentaries

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

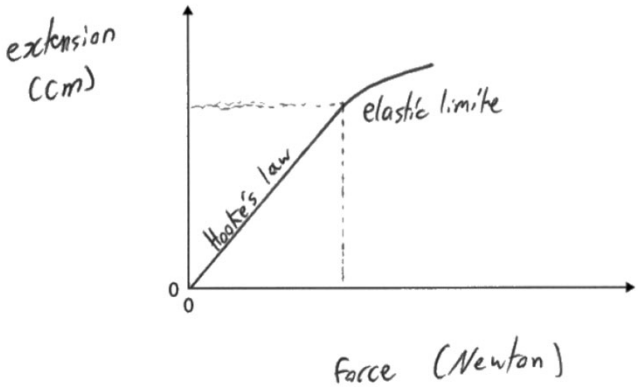


Not all answers have to be this full....this also got full marks



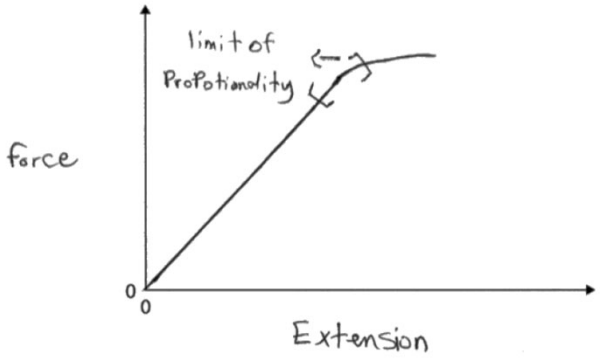
Inevitably, many students got the current increasing and resistance decreasing and so lost the marks.

Using the Examiners' Report



ResultsPlus
Examiner Comments

This response was also awarded 2 marks for the axes labels and the line starting at the origin. This time, the candidate has marked the start of the curvature as the "elastic limit". However, this is incorrect and was not credited.

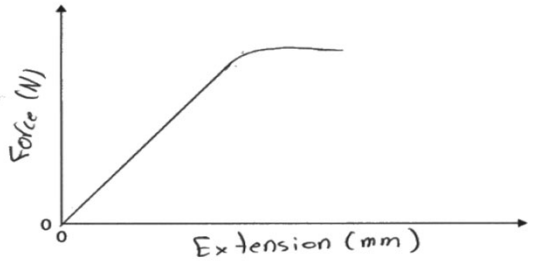


ResultsPlus
Examiner Comments

This response scored 3 marks. Although the line is curved, the labelling of "limit of proportionality" was deemed sufficient to indicate that Hooke's law was only being obeyed up to this point.

Question 5 (a)

This question was more challenging than anticipated and highlighted many misunderstandings in candidates' knowledge of Hooke's law. Some candidates were eager to demonstrate their knowledge and included a curved section in their line, therefore losing this mark. Many candidates scored 2 marks, usually for the axes labels and start point of the line. However, some candidates used incorrect or inappropriate terms for the graph labels.



ResultsPlus
Examiner Comments

This response was awarded 2 marks. The axes labels are correct and the line starts at the origin. However, the candidate has included a curved section, which is incorrect for a material obeying Hooke's law.

ResultsPlus
Examiner Tip

It is important that candidates read the question carefully so as not to misinterpret what is being asked of them.

Assessment Objective 1

AO1

AO1 Knowledge and understanding of physics
Identifying AO1 questions in assessments

The command word used in a question is often a very strong indicator as to which assessment objective that question is targeting.

Command words linked to AO1 questions may include:

- Add / label
- Describe
- Draw
- Give / state / name
- State what is meant by
- What / why / which (only used in multiple-choice questions)

AO1

This assessment objective covers all areas of physics that students should have routinely covered as part of studying the content of the specification. It covers the recall of formulae and units through to understanding standard identified contexts, such as explaining how a loudspeaker works.

Examples of AO1 questions

- State the formula linking average speed, distance moved, and time taken
- State the name of component X
- Describe the uses of three different radiations in the electromagnetic spectrum
- Describe how the average kinetic energy of a gas particle changes when the temperature of the gas increases
- Sketch a graph to show what is meant by a.c.
- Give an example of a longitudinal wave

Examples of AO1 questions from recent papers

- State the principle of conservation of momentum (November 2025)
- State the formula linking power, current and voltage (November 2025)
- On the graph, give the unit for activity (November 2025)
- State which stages of the cooling process show a change of state (November 2023)
- State a harmful effect of excessive exposure to x-rays (May 2023)
- Describe the difference between transverse waves and longitudinal waves (May 2023)

Other examples

- Give the name of the force that causes the Moon to orbit the Earth
- Give a harmful effect of infrared waves
- Describe the function of the control rods and the function of the moderator in a nuclear fission reactor
- Describe how the average kinetic energy of a gas particle changes when the temperature of the gas increases
- Sketch a graph to show that the spring obeys Hooke's law as it is stretched

Why do we ask AO1?

- A physicist should develop their knowledge and understanding of different physical processes and theories as their education develops.
- The purpose of AO1 is to assess students' knowledge and understanding of these processes and theories.
- AO1 questions are often (but not always) targeted at the lower and middle grade ranges (Grades 1-3 and Grades 4-6 respectively).
- AO1 is not limited to questions where students have to simply recall something from their knowledge. However, such recall questions would always be considered as targeting AO1.
- AO1 questions may be interpreted or referred to as 'standard' questions by teachers and students.

Some AO1 questions from the June 2024 papers

4PH1 1P Q1

1 This question is about the motion of objects in the solar system.

(a) (i) Draw a labelled diagram showing the Moon orbiting the Earth.

(ii) Give the name of the force that causes the Moon to orbit the Earth.

(1)

.....

(iii) Give the name of another object that orbits the Earth.

(1)

.....

(b) A planet and a comet both orbit a star.

Give a difference between the orbit of a planet and the orbit of a comet.

(1)

4PH1 1P

Q1 Mark Scheme

Question number			Answer	Notes	Marks
1	(a)	(i)	labelled diagram showing a moon in circular orbit around Earth; Earth approximately at the centre of the path;	allow planet for Earth judge circular by eye ignore attempts at 3D drawing allow planet for Earth	2
		(ii)	gravitational (force);	allow gravity ignore weight, centripetal, centrifugal reject gravitational potential, gravitational field strength	1
		(iii)	satellite / space station;	allow other suitable object e.g. (rocket) debris etc. reject comet	1
	(b)		planet's orbit is circular/slightly elliptical but comet's orbit is elliptical/oval; OR planet has constant speed but comet has variable speed;	clear comparison needed allow comet orbit is more elliptical ignore references to period/length of orbits allow idea that planet has constant orbital radius but comet has variable orbital radius	1

4PH1 1P Q3

3 The photograph shows infrared heating lamps being used to harden fresh paint on a car.

(Source: © Dmitry Kalinovsky / Shutterstock)

(a) Give a harmful effect of infrared waves.

(1)

.....

.....

(b) The heating lamps produce visible light waves in addition to infrared waves.

(i) Give two similar properties of visible light waves and infrared waves.

(2)

1 .....

.....

2 .....

.....

(ii) Give two differences between the properties of visible light waves and infrared waves.

(2)

1 .....

.....

2 .....

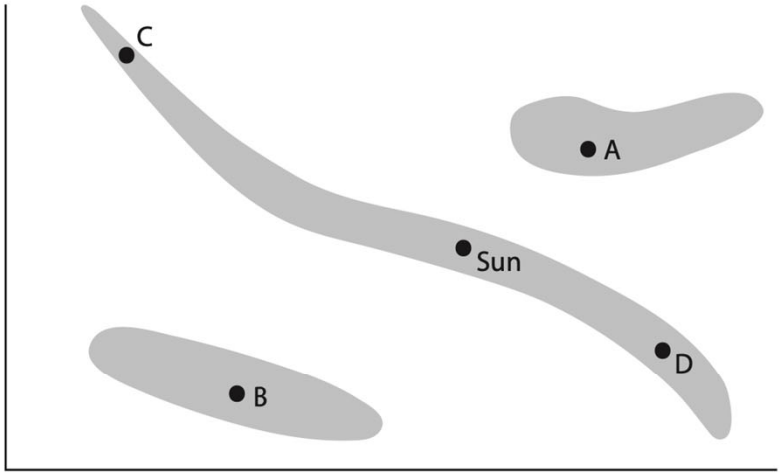
4PH1 1P
Q3 Mark scheme

Question number	Answer	Notes	Marks
3 (a)	{skin / eye / tissue} burns;	allow damage to surface cells, skin damage reject skin cancer, cell mutation, sunburn	1
(b) (i)	any two from: • both electromagnetic waves; • both transfer energy; • both transverse waves; • both are non-ionising; • both can travel through vacuum; • both have same speed (in a vacuum);	 allow EM waves allow both part of EM spectrum allow both can be reflected / refracted / diffracted	2
(ii)	• infrared has longer/higher wavelength; • infrared has lower frequency;	allow RA allow RA condone infrared has lower energy	2

4PH1 2PR Q1

1 This question is about stars.

The diagram shows an incomplete Hertzsprung-Russell (H-R) diagram.



(a) Label the axes on the diagram.

(2)

(b) There are three shaded areas on the diagram.

State the name of the shaded area that contains the Sun.

(1)

4PH1 2PR Q1 Markscheme

Question number	Answer	Notes	Marks
1 (a)	y-axis: one from • luminosity; • absolute magnitude; • power; x-axis: one from • temperature; • colour; • spectral class;	ignore brightness allow magnitude absolute 1 mark if both labels correct but on the wrong axes	2
(b)	main sequence;		1

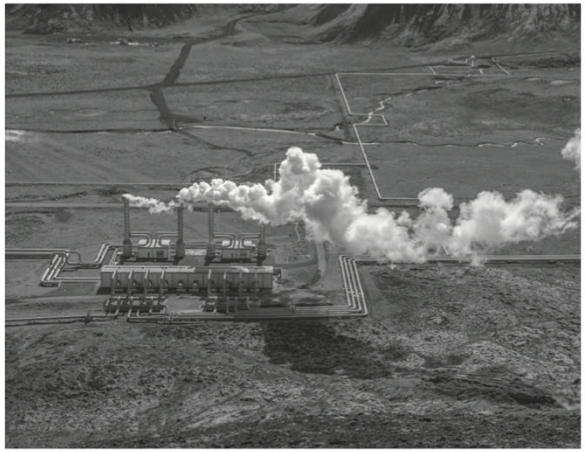
4PH1 2PR Q6

6 This question is about generating electricity from renewable energy resources.

(a) Photograph 1 shows a solar farm in the United Kingdom and photograph 2 shows a geothermal power station in Iceland.

Photograph 1

(Source: © Marcin Jucha / Shutterstock)



Photograph 2

(Source: © Javarman / Shutterstock)

Discuss the advantages and disadvantages of generating electricity using solar power and geothermal resources.

(4)

4PH1 2PR

Q6 Mark Scheme

Question number	Answer	Notes	Marks
6 (a)	any **one** advantage for solar: • produces no noise; • available in all locations; • no greenhouse/polluting/harmful gases produced; any **one** disadvantage for solar: • dependent on amount of sun(light); • requires large area of panels; any **one** advantage for geothermal: • can be used all day; • requires small amount of space; • produces very little/no noise; any **one** disadvantage for geothermal: • not available in all locations; • releases some greenhouse/polluting/harmful gases; • possible pollution of ground water;	ignore renewable ignore statements relating to cost allow doesn't work at night, depends on the weather allow takes up lots of space, idea that it takes away land for farming/agriculture etc. ignore renewable allow it is reliable, does not depend on the weather ignore statements relating to cost allow other named gases e.g. ammonia etc.	4

Activity 2 AO1 Marking Exercise

Return to the exemplar booklet and mark the examples of questions that assess AO1

Raising achievement in AO1 type questions

We need to improve students' :

- recall of formulae and their units .
- understanding the difference between 'use' and 'know and use'
- knowledge of prefixes such as m, M, k, G
- knowledge of SI units for various physical quantities
- recall of basic facts from the specification
- identifying the links between different parts of the specification
- understanding the demand of the command words we use

Targeting AO1 in class

Use of mini whiteboards MWB

- On your projector, have a few (max 5) recall items as a settling down exercise. Students answer on mini-whiteboards and then 'Hover' the board when ready.
- Give then a time limit....3 mins is often reasonable
- All pupils show the boards at the same time, so you can get full participation and find who does not know the content.
- It can be recall of last lesson, or necessary units, vocab or formula.
- Can also be used at any point in the lesson instead of 'cold calling'

Sequencing exercises

e.g. for convection currents
there is an easy example in your delegate pack

How can we help students with content?

- Give clear checklists for them each time we teach a topic.
- Encourage ‘metacognition’ by getting them to evaluate their own knowledge and learning of a topic.
- After tests and exams, get them to assess their ‘weaker’ topic areas by giving them a grid to write in their marks.

Checklist for topics

(c) Forces, movement, shape and momentum		☺	😐	☹
1.30P	*know and use the relationship between the moment of a force and its perpendicular distance from the pivot: moment = force X perpendicular distance from the pivot*			
1.31P	*know that the weight of a body acts through its centre of gravity*			
1.32P	*use the principle of moments for a simple system of parallel forces acting in one plane*			
1.32P	*understand how the upward forces on a light beam, supported at its ends, vary with the position of a heavy object placed on the beam*			

Assessment Objective 2
AO2

AO2

- Questions targeting this assessment objective will require students to apply their knowledge and understanding to a context that may not be familiar to them.
- Questions requiring a calculation also target AO2.
- The most demanding AO2 questions may require the use of a calculation to make a suitable evaluation about an unfamiliar context.

AO2

Why do we ask AO2?

- A physicist should be able to apply what they have learned to solve problems.
- A physicist should also be able to apply their knowledge and understanding in unfamiliar contexts.
- The most able physicists should be able to extend their knowledge and understanding into linked areas of study.
- AO2 questions are targeted at assessing these skills.

AO2 Activity 3

Questions which target AO2 also target all levels of demand.

Activity 3 Which of these target low demand, medium demand and high demand?

Examples of AO2 questions

1. Calculate the average speed of the ball
2. Explain how the sound heard from a buzzer changes when the buzzer is thrown towards a student
3. Explain why hydrogen must be heated to a high temperature for fusion to take place
4. Explain what information the two spectra give about the movement of the galaxy
5. Calculate the time taken for infrared waves emitted from a lamp to reach a car
6. Explain how the amount of current in the transmission cables increases the efficiency of the transmission of electricity
7. Explain the paths of the two rays of light after they strike the boundary between air and water

Command Words

The command word used in a question is often a very strong indicator as to which assessment objective that question is targeting.

Command words linked to AO2 questions may include:

- Calculate
- Comment on
- Deduce
- Determine
- Evaluate
- Explain
- Justify
- Show that
- Suggest

AO2
Calculation questions in AO2

- All calculations (unless they are linked to experimental skills) target AO2.
- Students are assessed on their ability to use a suitable formula and their mathematical skills to solve a quantitative problem.

Examples of what usually gains 1 marks are :

- ✓ Substituting values dimensionally correctly into a formula
- ✓ Rearranging a formula either in symbols or after substitution
- ✓ Changing units into standard units e.g 3 mins is 180 seconds
- ✓ Evaluating a mathematical expression to give an answer in decimal or standard form not fractions
- ✓ Giving an answer to a given number of significant figures (when requested)

In a 'show that' question show all working and give an answer to one more significant figure than the value stated in the question.

Some AO2 questions from the June 2024 papers

4PH1 1P Q5b

(b) Diagram 1 shows an object suspended from a support using a metal spring.

The object is initially at rest.

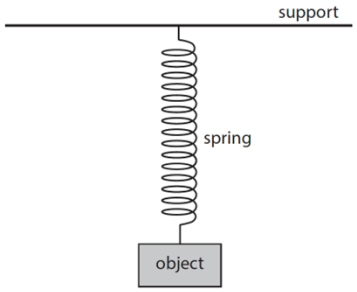


Diagram 1

(i) The object is pulled down and then released.

Diagram 2 shows the forces acting on the object at the instant it is released.

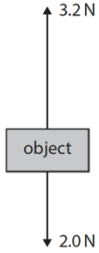


Diagram 2

Determine the magnitude and direction of the resultant force acting on the object.

(2)

magnitude of resultant force = ... N

direction of resultant force = ...

(ii) The object has a mass of 0.20 kg.

Calculate the acceleration of the object at the instant it is released.

(3)

acceleration = ... m/s^2

(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)

.....

.....

.....

.....

.....

.....

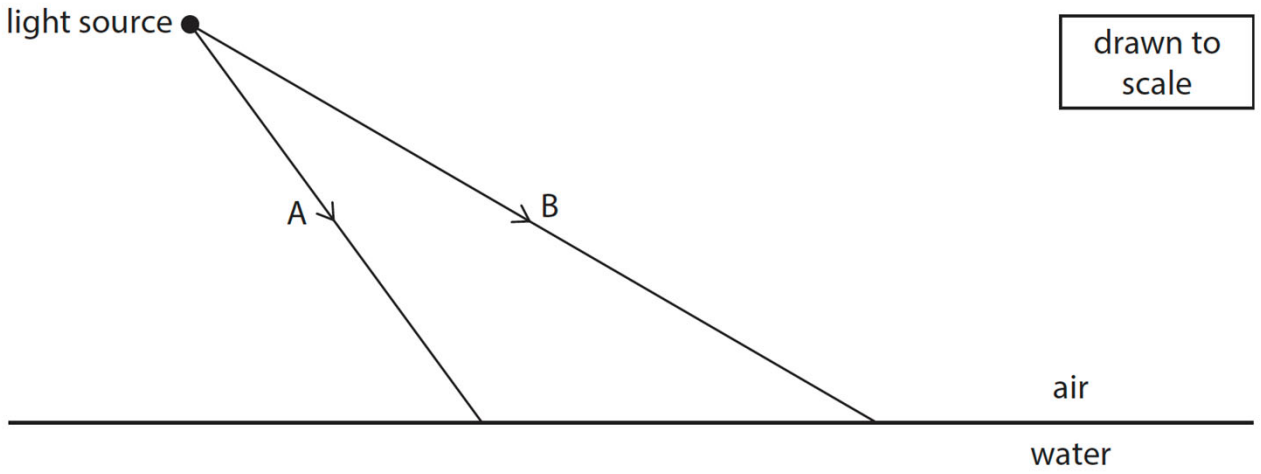
4PH1 1P

Q5b Mark Scheme

(b)	(i)	magnitude = 1.2 (N); direction = up(wards);	allow arrow pointing up ignore unqualified "north"	2
	(ii)	substitution into F = m × a; rearrangement; evaluation; e.g. 1.2 = 0.20 × a a = 1.2 / 0.20 (a =) 6.0 (m/s^2)	allow ecf from (i) -1 for POT error allow 6 (m/s^2)	3
	(iii)	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

4PH1 1P Q8 - 6 marks

8 The diagram shows two rays of light, A and B, incident on the boundary between air and water.



The refractive index of water is 1.33

Explain the paths of the two rays of light after they strike the boundary between air and water.

Include calculations in your answer and draw on the diagram to support your answer.

4PH1 1P

Q8 - 6 marks Mark Scheme

Question number	Answer	Notes	Marks
8	any six from:		6
	MP1. ray A is refracted and changes direction;	may be shown on diagram by ray passing through boundary ignore reflected rays allow 1 mark max. from MP1 and MP2 if either ray is refracted in the wrong direction	
	MP2. ray B is refracted and changes direction;		
	MP3. correctly measured angle of incidence for either ray;	allow 34°-38° for ray A, 58°-62° for ray B	
	MP4. correctly calculated angle of refraction for either ray A or ray B;	may be shown on diagram allow ecf from angles of incidence expect 24°-28° for A and 39°-42° for B	
	MP5. water and air have different (optical) densities;	condone air having a higher (optical) density than water	
	MP6. light travels slower in water than air;	allow RA	
	MP7. TIR does not happen because water is more (optically) dense than air;	ignore calculated values of the critical angle as not relevant	

4PH1 1P Q11c

(c) A student owns three electronic devices. Each electronic device stores a different amount of charge.

The table gives some information about the charge stored by the electronic devices and how often they need to be recharged.

Electronic device	Charge stored in Ah	Frequency of recharging
A	2.4	once every day
B	4.2	once during the week
C	6.8	once during the week

The power bank stores a maximum charge of 26.8 Ah.

The student needs to take these three electronic devices on a school trip for one week.

Determine whether the maximum charge of the power bank is enough to recharge the batteries of the three electronic devices during the school trip.

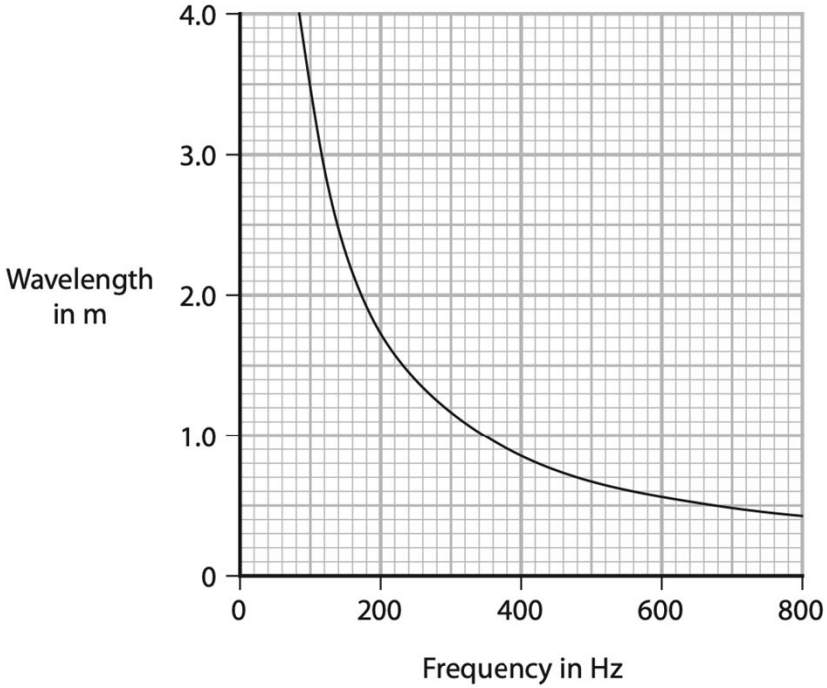
(4)

4PH1 1P
Q11c Markscheme

(c)	any four from: MP1. determination of total charge needed for the week; MP2. quantitative comparison to power bank charge; MP3. idea that power bank cannot recharge all devices (from completely flat); MP4. idea that devices will not always be completely empty when recharged; MP5. idea that devices could be used less (which would make them last longer before recharging); MP6. idea that other charging facilities might be available;	27.8 (Ah) or 100 080 C allow 27.8 is greater than 26.8 allow power bank is 1 Ah less than needed allow ecf from MP1 allow power bank is not suitable/enough allow idea that devices could be partially charged allow idea that power bank could be recharged during trip	4

4PH1 2PR Q9c

(c) The graph shows how the wavelength of sound waves in air varies with their frequency.



If wavelength and frequency are inversely proportional, then

wavelength × frequency = constant

Using the graph, evaluate whether the wavelength of sound waves in air is inversely proportional to their frequency.

(3)

4PH1 2PR Q9c Markscheme

(c)	single use of data from graph to show that frequency × wavelength = constant; second use of data from graph to show that frequency × wavelength = constant; clear comparison of constants to show they are (approximately) equal AND conclusion that the relationship is inversely proportional;	constant should be between 320 and 360 depending on data used	3

Activity 4 AO2 Marking exercise

Return to the exemplar booklet and mark the examples of questions that assess AO2

Raising achievement in AO2 type calculation questions

Many students find AO2 questions more challenging than AO1 questions.

Students who have difficulty rearranging formulae find calculations very difficult. The following suggestions may improve achievement:

- Substitute data into a formula before rearranging it as this is usually worth 1 mark.
- Try rearranging formula after substituting data – this makes the problem more similar to a maths exercise and some students find they can solve a problem this way.
- Practise as many calculations with as many different formulae as possible, especially with more demanding formulae
  such as $v^2 = u^2 + 2as$.

Maths in Science PDFs for students….

This is one I highly recommend from our website

Standard form

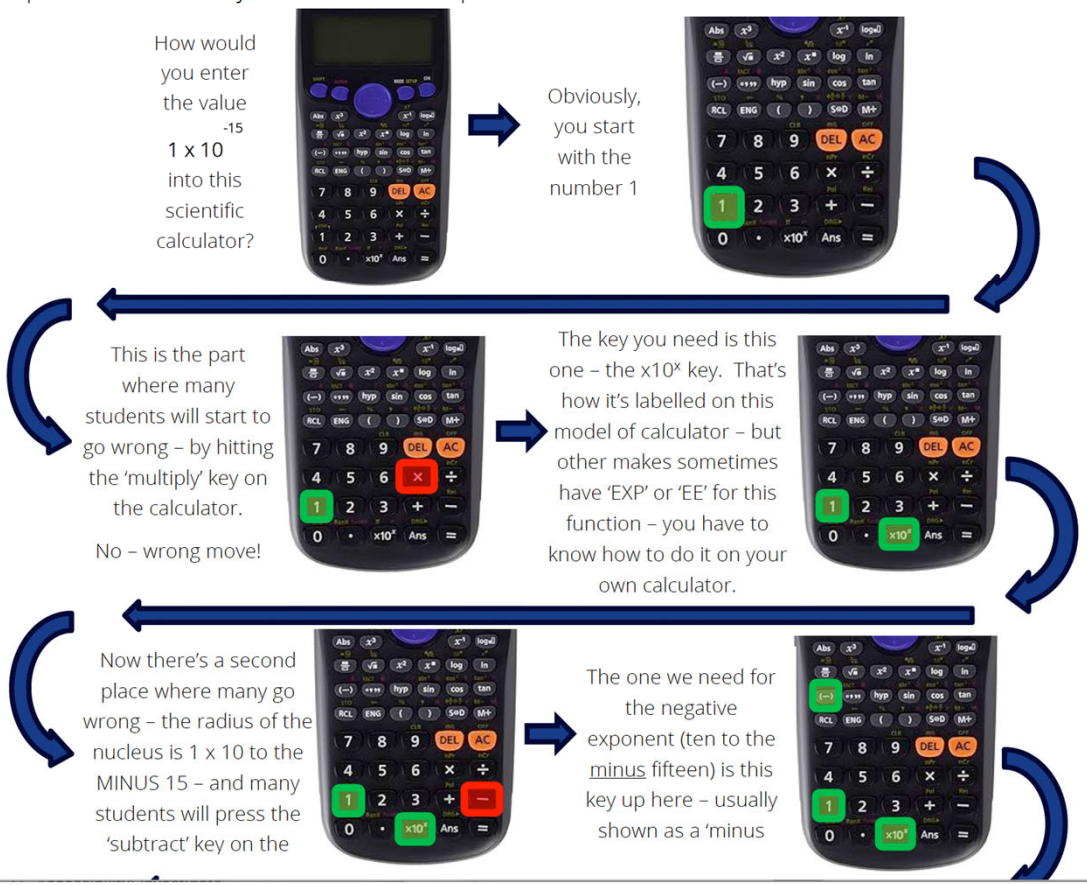
This statement appears in an exam question:

A nucleus of an atom has a radius of 1.0×10^{-15} m

The value 1.0×10^{-15} is in **standard form**, and many students struggle to handle numbers expressed like this. Another way of writing the same value would be:

0.000 000 000 000 001

…and many students would try to do this to use the number in a calculation. Often, the problem is that they aren't sure how to put numbers in standard form into their calculator.



Raising achievement in AO2 type suggest questions

The command word '*suggest*' is used when students are being asked to extend their knowledge and understanding to a completely unfamiliar context.

Students should be encouraged to think carefully before answering such questions.

Teachers should refer to such questions as being about something the students haven't been taught before, but that can be answered using their existing knowledge and understanding.

Raising achievement in AO2 type questions
Practice, Practice and Practice!

- Some students have difficulty remembering formulae and their units---MWB again!
- Know the meanings of prefixes such as m, M k, G etc as well as units for various physical quantities.
- Please don't use a 'triangle' for formulae. Its just another thing students 'have' to remember.
- Please do liaise with your Maths department as to how they teach rearrangement and solving equations. Are you using a method the students don't recognise?
- Remove the word 'it' from your students' responses
- Understand the demand of the command words identified in the specification.
- Avoid repeating the stem of the question. It wastes time and space.
- Generally, aim for 1 mark of every 2 lines or writing---AND use bullet points.

Assessment Objective 3 AO3

AO3

Why do we ask AO3?

- A student pursuing an education or career in physics must be able to plan and carry out experiments to test a scientific theory.
- The specification outlines 12 compulsory experiments to enable students to develop their experimental skills.
- Questions targeting AO3 assess these experimental skills.

AO3 Command Words

AO3 questions can be whole questions or parts of questions.

The command word used in a question is often a very strong indicator as to which assessment objective that question is targeting.

Command words linked to AO3 questions may also include:

- Add/Label
- Evaluate
- Estimate
- Measure
- Analyse the data / graph to explain
- Design
- Draw
- Give / state / name
- Plot
- Predict

NB some command words are equally applicable for AO2 as well

AO3 12 Practical Investigations

Students are expected to have completed the 12 practical investigations outlined in the specification. Ideally, they will also have completed many other practical investigations.

Questions targeting AO3 assess students' knowledge and understanding of designing, performing, presenting and concluding an experimental investigation.

Examples of AO3 questions

- ✓ Draw a voltmeter on the circuit diagram to measure the voltage of component X
- ✓ State two control variables for this investigation
- ✓ Plot the student's results on the grid
- ✓ Explain which type of graph is appropriate for this investigation
- ✓ Describe how the power output of a wind turbine varies with wind speed using data from the graph
- ✓ Evaluate a student's conclusion
- ✓ Suggest a reason for the anomalous result

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.

Some AO3 questions from the June 2024 papers

4PH1 1P Q10b

(b) This is the student's method for the investigation.

- clamp the wooden strip so that L = 20 cm
- fix the load to the end of the wooden strip, as shown in diagram 1
- measure the height, h

The student repeats this method for different values of L.

(i) Give the independent and dependent variables in the investigation.

(2)

independent variable

.....

dependent variable

.....

(ii) Give two control variables in the investigation.

(2)

1 .....

2 .....

(iii) Suggest how the student could accurately measure the height, h.

(2)

(b)	(i)	independent variable = length (extending beyond table);
		
		dependent variable = height;
			allow L/l
			condone length of wood(en strip)
			
			allow H/h
				2

	(ii)	any two from: • mass/weight of load; • position of load (on wooden strip); • thickness of wood(en strip); • material/type of wood(en strip);	ignore "same load" on its own allow "same wood(en strip)" in the absence of either of these marks	2
	(iii)	any two from: MP1. use of (metre) rule; MP2. fixed in place at end of wooden strip; MP3. 0 on rule placed at original height of wooden strip; MP4. method to ensure measurement is vertical e.g. using a plumb line, set square etc.; MP5. measure at eye level;	allow tape measure condone metre stick allow alternative valid methods e.g. distance measured up from the ground with and without load ignore unqualified references to parallax error	2

4PH1 1P Q10c

(c) The table shows the results of the investigation.

Length (L) in cm	Height (h) in cm
20	2
40	8
60	18
80	
100	53
120	71

(i) Diagram 2 shows the wooden strip when L = 80 cm.

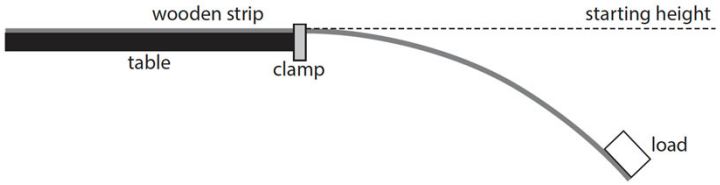


Diagram 2

Using diagram 2, determine the height, h, in the laboratory.
[1 cm on the diagram = 10 cm in the laboratory]

(2)

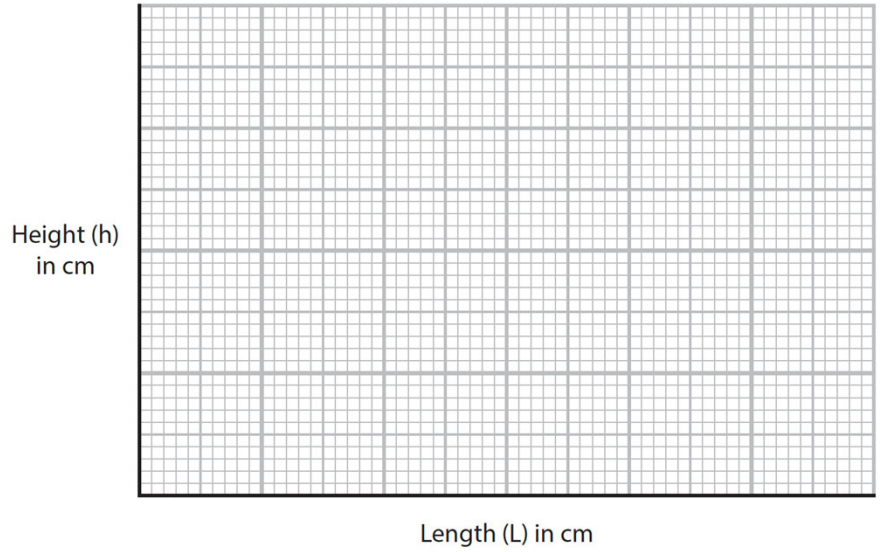
height, h = ... cm

(ii) Plot a graph of the student's results.

(2)

(iii) Draw the curve of best fit.

(1)



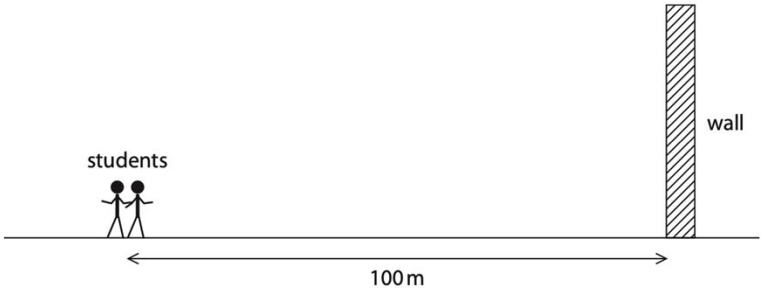
(iv) The student concludes that h is directly proportional to L.

Evaluate the student's conclusion.

(2)

4PH1 2PR Q7

7 The diagram shows two students doing an experiment to measure the speed of sound in air.



This is their method.

- both students stand 100 m away from a large flat wall
- student A makes a sound by hitting two blocks of wood together
- the sound waves travel to the wall and reflect back to the students as an echo
- student A hits the blocks together again when the echo is heard
- student A continues to hit the blocks together every time an echo is heard
- student B starts a timer when the blocks are hit together and stops the timer when the blocks have been hit together 20 more times

(a) Give a reason why the students do not stand nearer to the wall.

(1)

(b) The students repeat their method five times.

The table shows the students' results.

Time between starting and stopping timer in seconds					
test 1	**test 2**	**test 3**	**test 4**	**test 5**	**mean**
11.80	11.18	11.76	11.75	11.72	

(i) The students decide that one of their tests shows an anomalous result.

Circle the anomalous result in the table.

(1)

(ii) Suggest a reason for the anomalous result.

(1)

.....

.....

.....

(iii) Calculate the mean time between starting and stopping the timer.

Give your answer to a suitable number of decimal places.

(3)

mean time = ... s

(iv) The speed of sound in air can be calculated using the formula

$$\text{speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

Use the students' results to calculate a value for the speed of sound in air.

(3)

4PH1 2PR Q7 Markscheme

Question number			Answer	Notes	Mark
7	(a)		idea that time (between hits) is too short / reaction/thinking time is an issue;	ignore thinking distance, human error	1
	(b)	(i)	11.18 circled;		1
		(ii)	idea that student miscounted the number of block hits;	ignore "reaction time", human error allow idea that timer was started late / stopped early allow idea that distance to wall is different	1
		(iii)	evaluation of a mean value; evaluation of a mean value excluding anomaly; final answer correctly given to 2 decimal places; e.g. mean = 11.642 (s) mean = 11.7575 (s) mean = 11.76 (s)	allow even if anomaly included allow ecf from (i) independent mark 11.642 scores 1 mark 11.64 scores 2 marks 11.75 scores 2 marks	3
		(iv)	substitution into given formula; evidence of doubling distance OR dividing time by 20; evaluation; e.g. speed = (2×) 100 / 11.76(÷20) distance = 200m OR time = 0.59s speed = (200 / 0.59) = 340 (m/s)	allow ecf from (iii) condone lack of ×2 and ÷20 8.5 (m/s) scores 1 mark 17, 170 (m/s) scores 2 marks allow 340.2…, 340.1… (m/s)	3

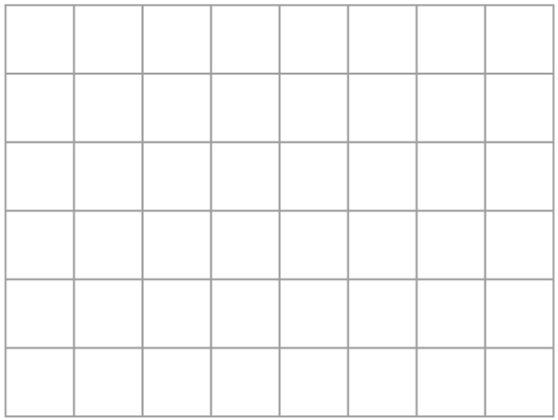
4PH1 2PR Q9b and Mark Scheme

9 An oscilloscope can be used to determine the frequency of a sound wave.

(a) Give the name of the piece of apparatus that must be connected to the oscilloscope to detect the sound wave.

(1)

(b) The diagram shows the screen of the oscilloscope and the oscilloscope settings.



oscilloscope settings:

y direction: 1 square = 2 V
x direction: 1 square = 0.001 s

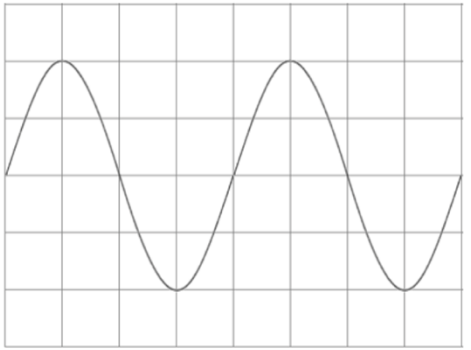
A sound wave of frequency 250 Hz is detected.

The sound wave produces a trace on the oscilloscope of amplitude 4 V.

Complete the diagram by drawing the trace of this sound wave on the oscilloscope screen.

(5)

9	(a)	microphone;		1

	(b)	any roughly sine-shaped wave drawn on the screen;
		amplitude of trace = 2 squares;
		substitution into f = 1 / T;
		
		evaluation of time period = 0.004 (s);
		trace drawn on oscilloscope has period of 4 squares;
		
		e.g.
		 
			allow triangle wave
			
			e.g. 250 = 1/T
			or T = 1/250
			
			automatically scores last three marking points
				5

Activity 5 AO3 Marking exercise

Return to the exemplar booklet and mark the examples of questions that assess AO3 with some bits that are AO2 (can you spot the parts?)

Activity 6…..marking extended writing AO3

4PH1 2P Q4b & Q4c June 2023

(c) Design a method that the student could use to investigate how the temperature of the ball affects the maximum height after it bounces.

Your answer should include details of

- apparatus needed
- measurements required
- control variables

You may draw a diagram to support your answer.

(6)

4PH1 2P
Q4c mark scheme

(c)	six marks as distributed: **apparatus (2 marks max.)** MP1. ruler / tape measure; MP2. idea of water bath (and thermometer); **measurements (2 marks max.)** MP3. range of temperatures; MP4. height of the ball's (first) bounce; MP5. height measured at eye level; MP6. repeats taken **at each temperature** and mean found; **control variables (2 marks max.)** MP7. height ball is dropped from; MP8. surface the ball bounces on; MP9. condition of drop; MP10. idea of using multiple copies of the same ball;	marks can be awarded if clear from diagram allow use of heated beaker and water with thermometer reject idea of heating ball directly with a Bunsen burner allow other methods of direct heating must be clear that different temperatures are tested allow reduce parallax error allow use of phone/video camera AND idea of freeze frame or ruler in shot i.e. non-human dropping mechanism or checking that ball is dropped from rest	6

Planning practicals----using scaffolding, start simple and start early

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 resistance of the LDR _____"

"Circle any anomalous values"

"Two sources of error are _____"

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

Planning practicals---reduce the scaffolding with older students

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.

Raising achievement in AO3 type questions

In recent examination series, students commonly lost marks for…

- Confusing the independent, dependent and control variables in an experiment.
- Not being aware of which type of graph is appropriate for a particular experiment.
- Not understanding the meaning of the terms: *accuracy*, *precision*, *reliability* and *validity**.
- Designing methods that do not focus on the scaffolding bullet points used in the question.

Teachers should aim to provide as many opportunities as possible for practical work as are realistic in the teaching timeframe.

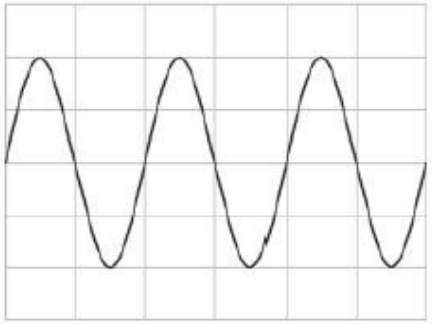
**The conclusive meanings of these terms are taken from the "Guidance on using practical terminology" document on the qualification's website. Also included in the material in your pack.*

Assessed 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.
- 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

Example: Core practical 7 - Frequency of Sound Questions

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

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?

that are covered in the practical:

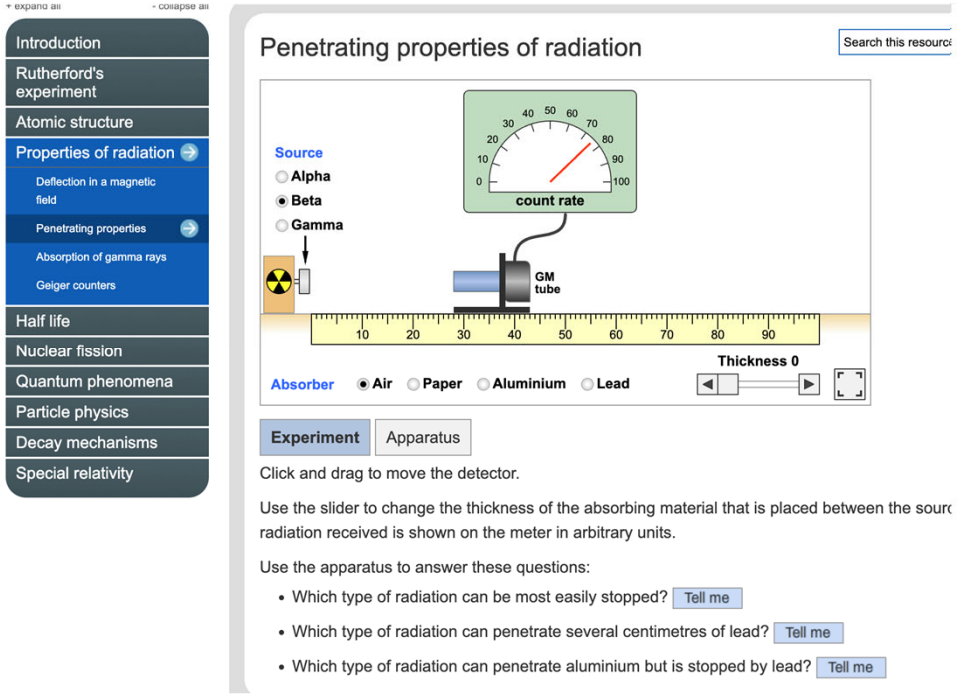
Use of an oscilloscope
Use of a signal generator and loudspeaker to produce a sound
Appreciation of orders of magnitude

Question number	Answer	Accept	Reject	Marks
(a) (i)	3;	Three /3.0		1
(ii)	0.002 (s) / 2ms ; 500 (Hz) / 0.5kHz	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.

Other sources of support for Practical Work

Some experiments are difficult to perform as they need expensive equipment or radioactive sources
The Useful Links handout mentions IOP, STEM (both free)and Focus and ASE (both paid for)



FOCUS

A video showing how to use an oscilloscope: IOP Spark

Facilitating achievement in the examination

What our examiners have noticed – comments from examiner reports

- 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.

Activity 7, an exercise to do with your colleagues or even with your students

Students need opportunities to practise applying their knowledge and understanding in unfamiliar contexts.

Exam wizard and past papers allow teachers to provide students (free of charge) with past examination questions.

Teachers may also wish to write their own questions and worksheets to give their students opportunities to practise applying their knowledge and understanding of a particular area of the syllabus.

Refer to the Activity7 booklet in your delegate pack. Using the given context, write one question (with accompanying mark schemes) that will allow students to practise applying their knowledge and understanding of physics.

Other suggestions

- Using a spiral curriculum – teaching a little of each of the 8 topics in each year of study to allow frequent opportunities to revise and revisit challenging concepts and theories.
- Whiteboard starter activities / mini plenaries – assess students' retention of key concepts at the beginning of a lesson and at relevant points throughout the lesson.
- Revision flashcards – these can be bought or made (even better for students to make their own) to revise definitions, formulae and units that need to be recalled.
- Topic checklists – edit the specification to turn it into a list of questions for students to answer.

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’.

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 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'.

Walking-talking mocks

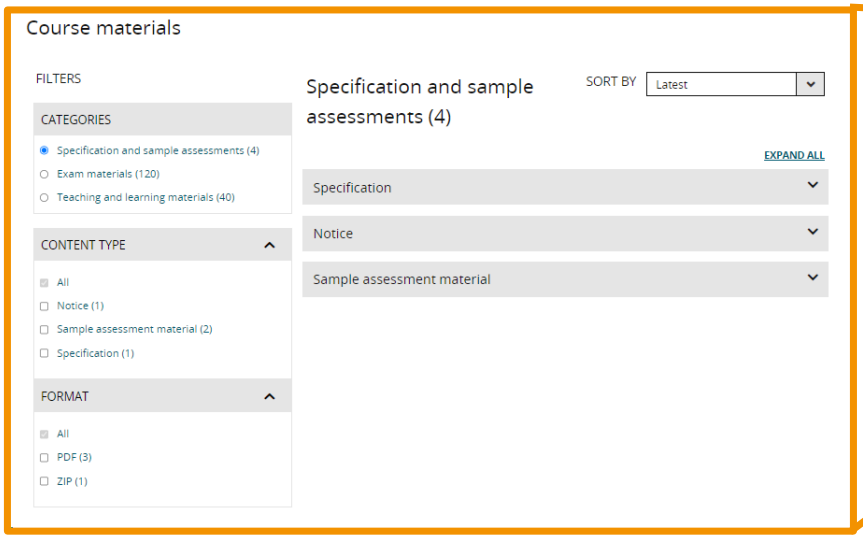
- Students sit in the same exam room where they will do their exam, preferably in the same seats (it can be done in the classroom, but not always as effective in building confidence in exam conditions)
- Students are given an exam paper which is as close to being like the real thing as possible (i.e. 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

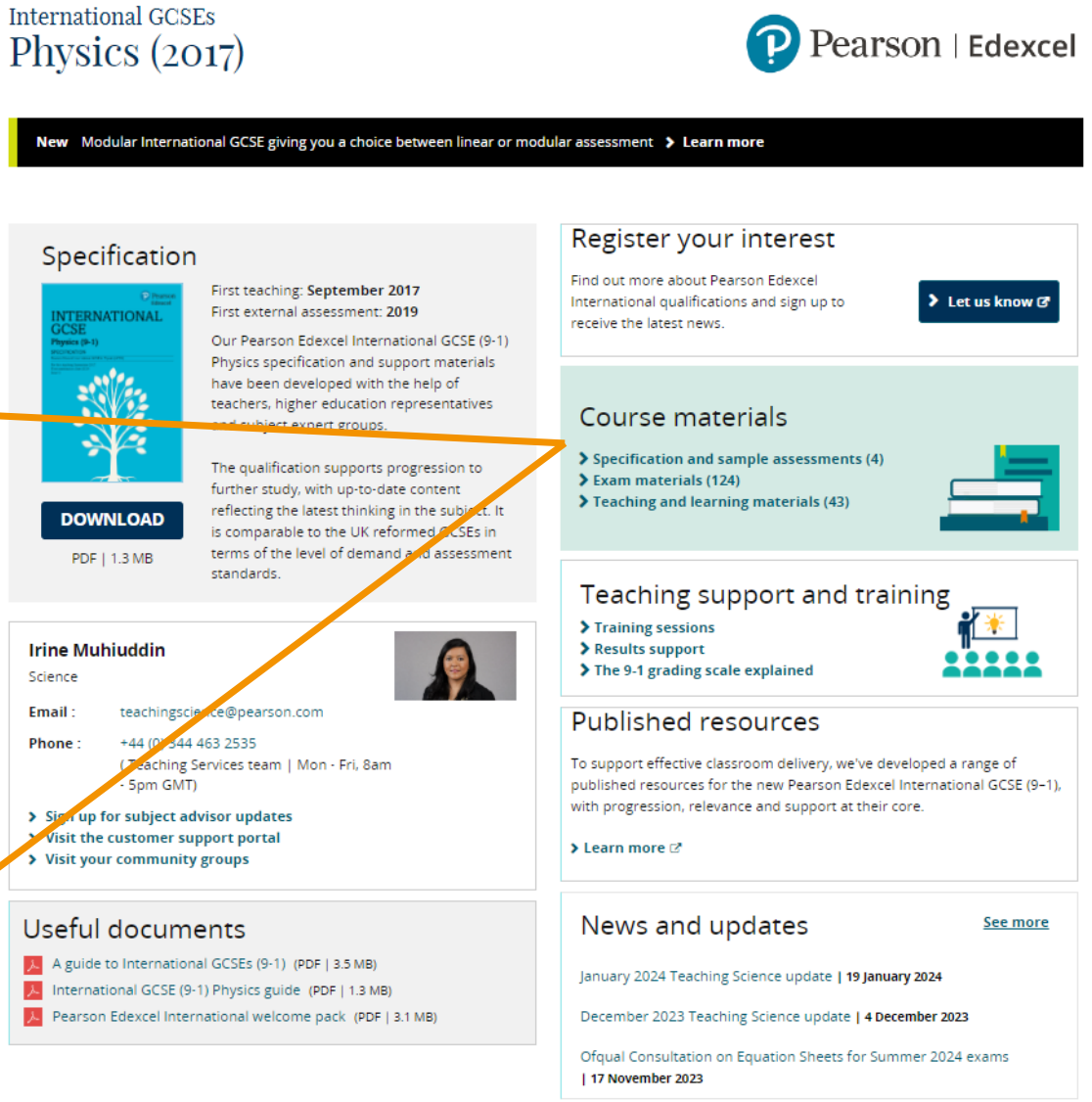
Support and resources

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 for Exam preparation and post results

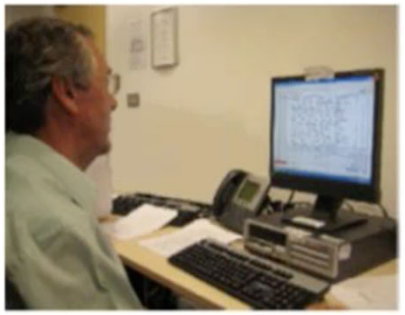
ResultsPlus

- 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	✓	✓	

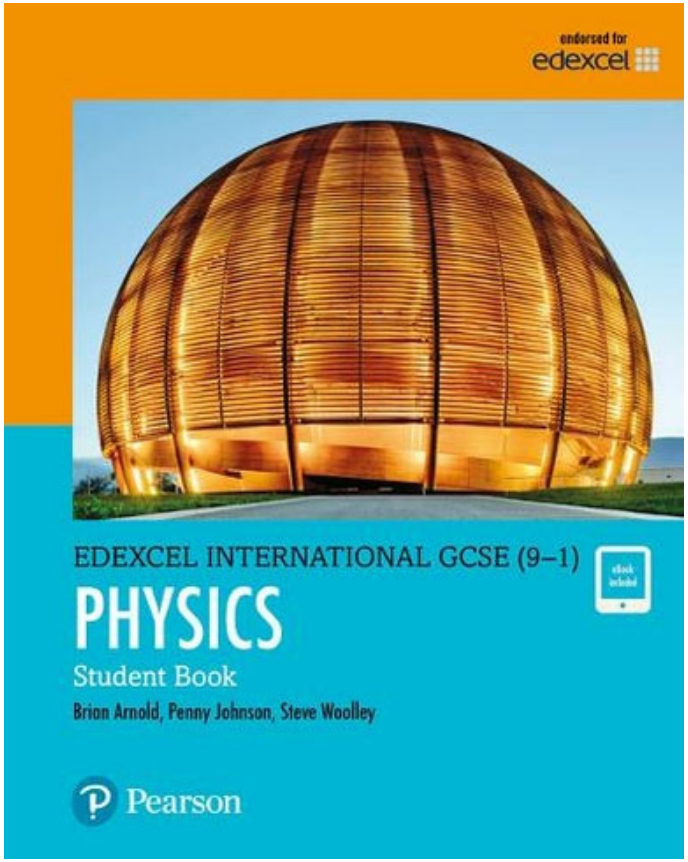
Pearson published resources

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.

Further Information

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