

# PEARSON EDEXCEL INTERNATIONAL GCSE (9-1) **Physics**

WELCOME TO PEARSON

Event code: 4PH1-20IO2. MODULE 2 - ASSESSMENT

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First teaching in 2017, first assessment in 2019.

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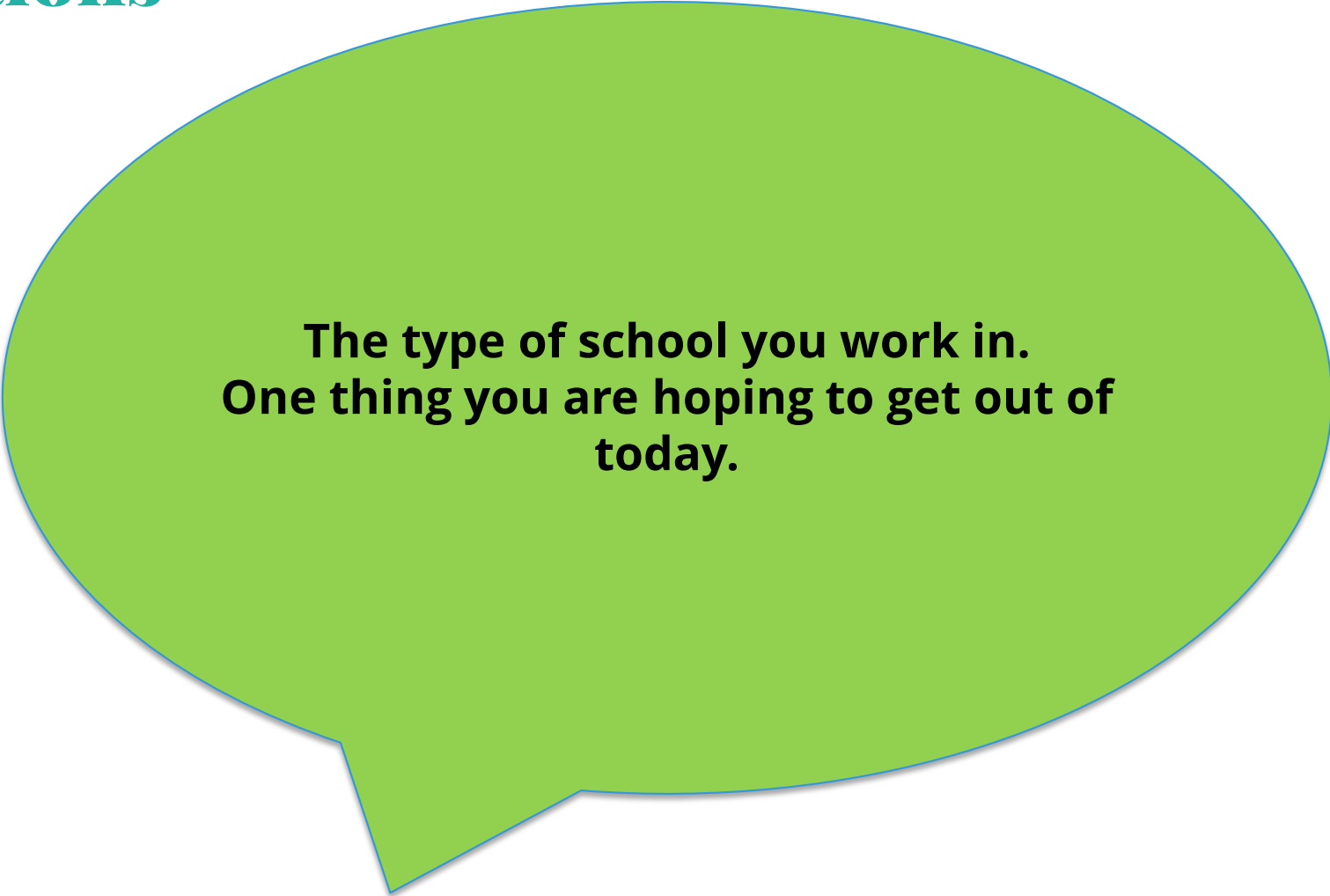


# Agenda

**In this training, you will:**

- ❖ Understand the Assessment Objectives for the qualification
- ❖ Understand the question types and mark schemes for the qualification
- ❖ Practise 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
- ❖ Learn about some of the support provided by Pearson around assessment and exemplars

# Introductions



**The type of school you work in.  
One thing you are hoping to get out of  
today.**

# How is the content assessed?

Paper 1	Paper 2
<ul style="list-style-type: none"><li>• Externally assessed</li><li>• Availability: January and June</li><li>• First assessment: June 2019</li></ul> <p>61.1% of the total International GCSE</p>	<ul style="list-style-type: none"><li>• Externally assessed</li><li>• Availability: January and June</li><li>• First assessment: June 2019</li></ul> <p>38.9% of the total International GCSE</p>

# How is the content assessed?

Paper 1	Paper 2
<p>Assesses core content that is <b>not</b> in bold and does not have a 'P' reference. Questions may come from any topic area across the specification.</p> <ul style="list-style-type: none"><li>1 Forces and motion</li><li>2 Electricity</li><li>3 Waves</li><li>4 Energy resources and energy transfers</li><li>5 Solids, liquids and gases</li><li>6 Magnetism and electromagnetism</li><li>7 Radioactivity and particles</li><li>8 Astrophysics</li></ul>	<p>Assesses <b>all the content</b>, including content that is in bold and has a 'P' reference. Questions may come from any topic area across the specification.</p> <ul style="list-style-type: none"><li>1 Forces and motion</li><li>2 Electricity</li><li>3 Waves</li><li>4 Energy resources and energy transfers</li><li>5 Solids, liquids and gases</li><li>6 Magnetism and electromagnetism</li><li>7 Radioactivity and particles</li><li>8 Astrophysics</li></ul>

# What are the assessment objectives?

## Assessment objectives and weightings

		International GCSE
<b>A01</b>	Knowledge and understanding of physics	38–42%
<b>A02</b>	Application of knowledge and understanding, analysis and evaluation of physics	38–42%
<b>A03</b>	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		
	A01	A02	A03
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%
<b>Total for International GCSE</b>	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)

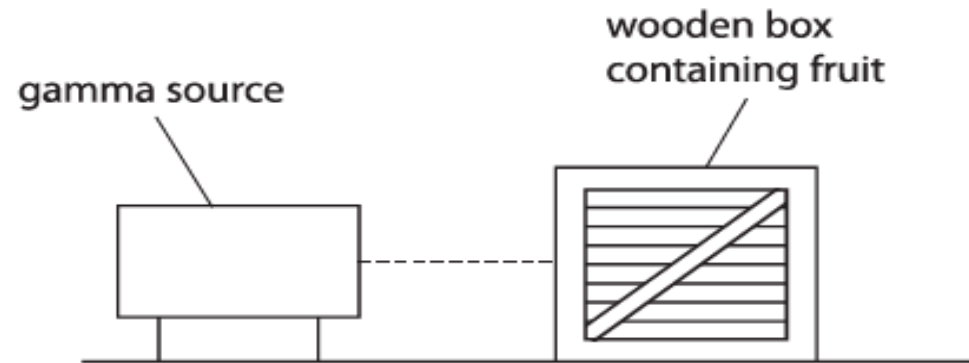
- ☐ **A** infrared
- ☐ **B** radio
- ☐ **C** sound
- ☐ **D** ultraviolet

# 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

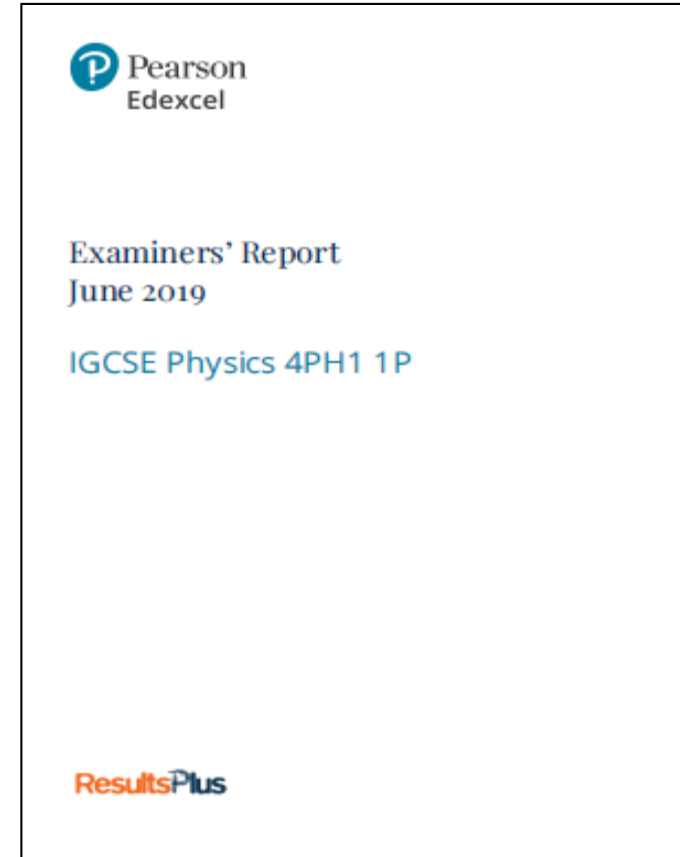
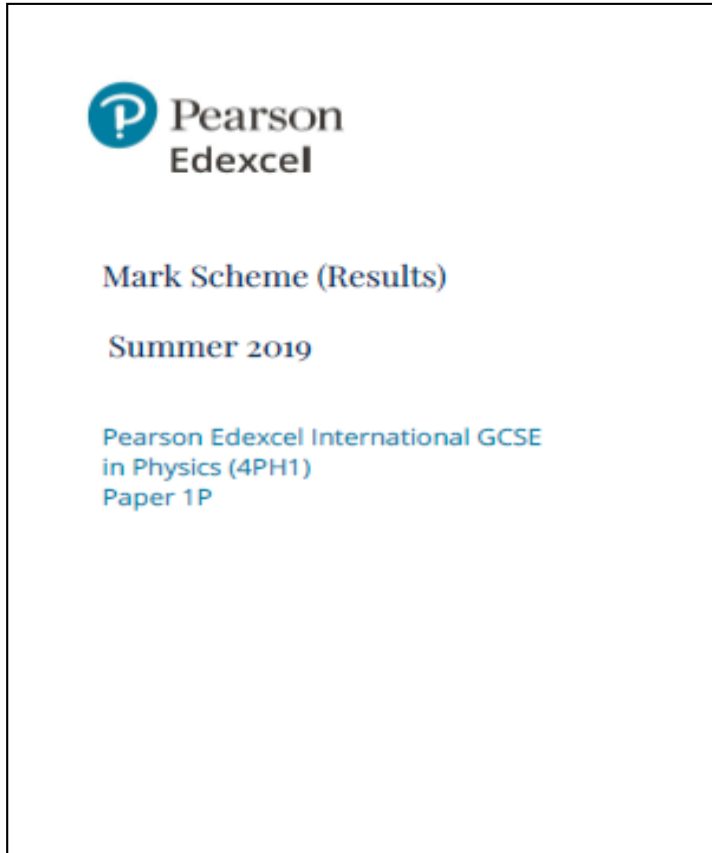
(4)

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# What are mark schemes and examiner reports?



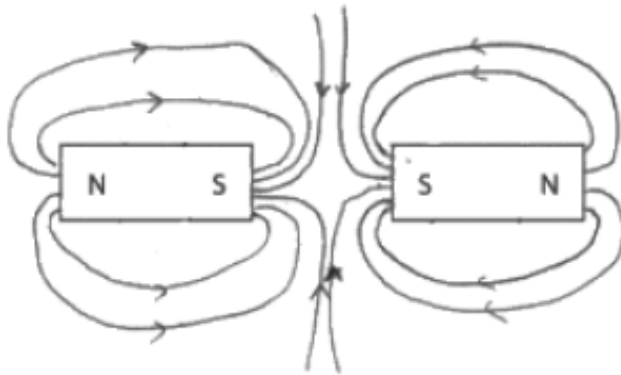
# What are mark schemes?

- ❖ 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)	<p>MP1. method to show shape; e.g. use compass(es) use of iron filings / powder</p> <p>MP2. use of plotting compass <b>to show direction</b>;</p> <p>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)</p>	<p>all marks may be given from diagram</p> <p>allow if compass seen in diagram pointing in a suitable direction</p> <p>allow equivalent materials to card e.g. paper, plastic etc.</p>	3

# What is in the mark schemes?

(b)	<p>correctly drawn field line patterns for both bar magnets;</p> <p>correctly drawn field line pattern for region between the magnets;</p> <p>at least three field line directions given from north to south;</p> 	<p>should show no lines linking south poles</p> <p>not every line needs to have an arrow reject mark if directions contradict</p> <p>2 marks max. if any lines overlap</p> <p>condone lines touching</p>	3
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# 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
A01	Knowledge and understanding of physics	38–42%
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A03	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?

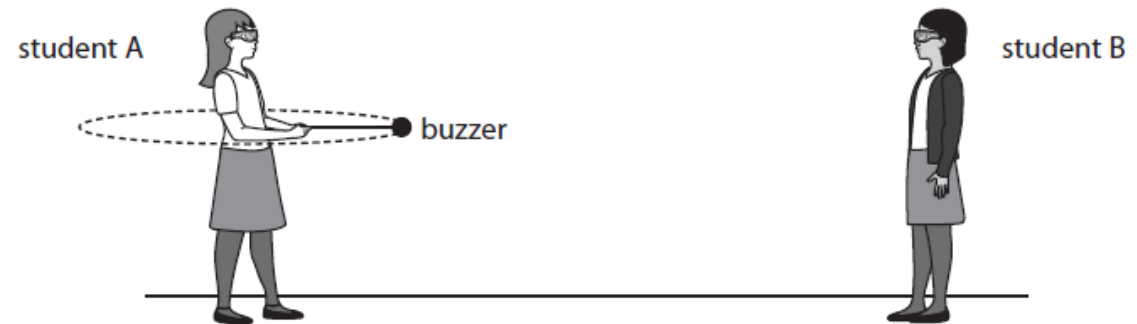
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The sound heard by student A is different to the sound heard by student B.

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  $A_3$  when the circuit is placed in a darkened room.

It decreases, because X is an LDR so with less light, resistance increases and if  $V$  is a constant in  $V = R \times I$  at 12V, then an increase in  $R$  means a decrease in  $I$ . (2)

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

(ii) Explain what happens to the current through  $A_3$  when the circuit is placed in a darkened room.

It is lower, because the LDR has a higher resistance. (2)

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
10	120

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

(4)

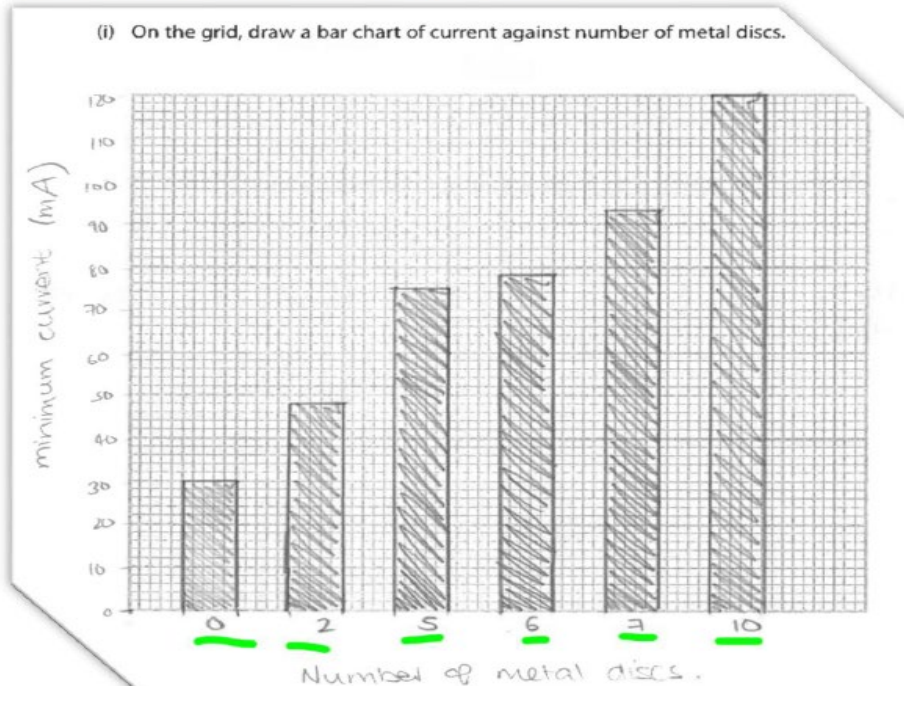
Answer	Mark
<ul style="list-style-type: none"> <li>Scale on the y-axis (1)</li> <li>Both axes labelled with variable and unit (1)</li> <li>Plotted (1)</li> <li>Bars drawn (1)</li> </ul>	4



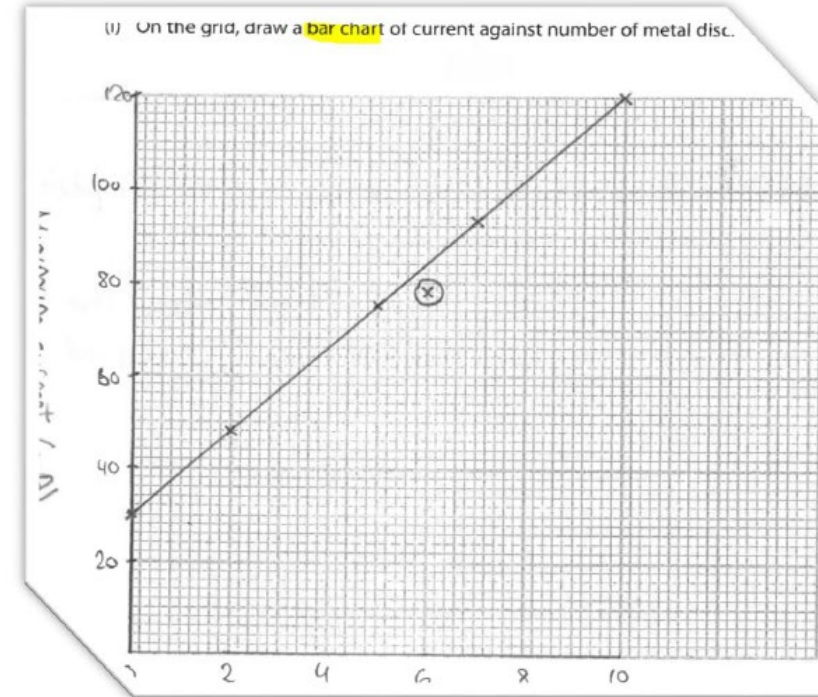
# Exemplars Activity:

- what mark would you give?

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



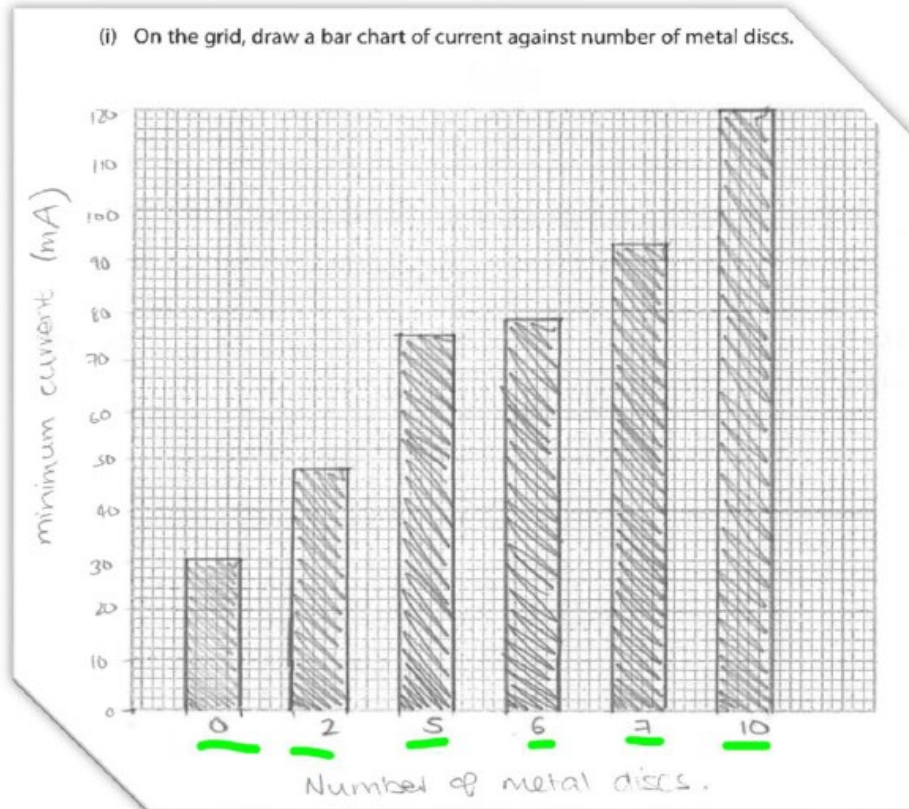
This student got the scales correct but attempted a scatter-gram or line graph and omitted a label. Two marks only awarded.



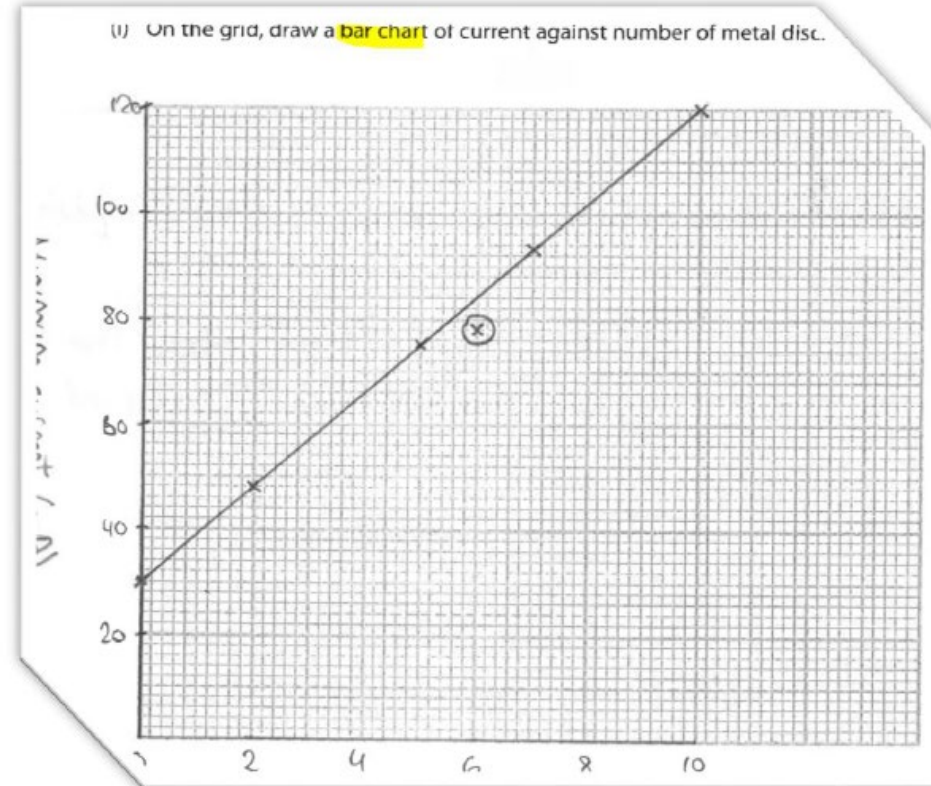
Answer	Mark
<ul style="list-style-type: none"> <li>Scale on the y-axis (1)</li> <li>Both axes labelled with variable and unit (1)</li> <li>Plotted (1)</li> <li>Bars drawn (1)</li> </ul>	4

# Exemplars

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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 (**A03**) 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.

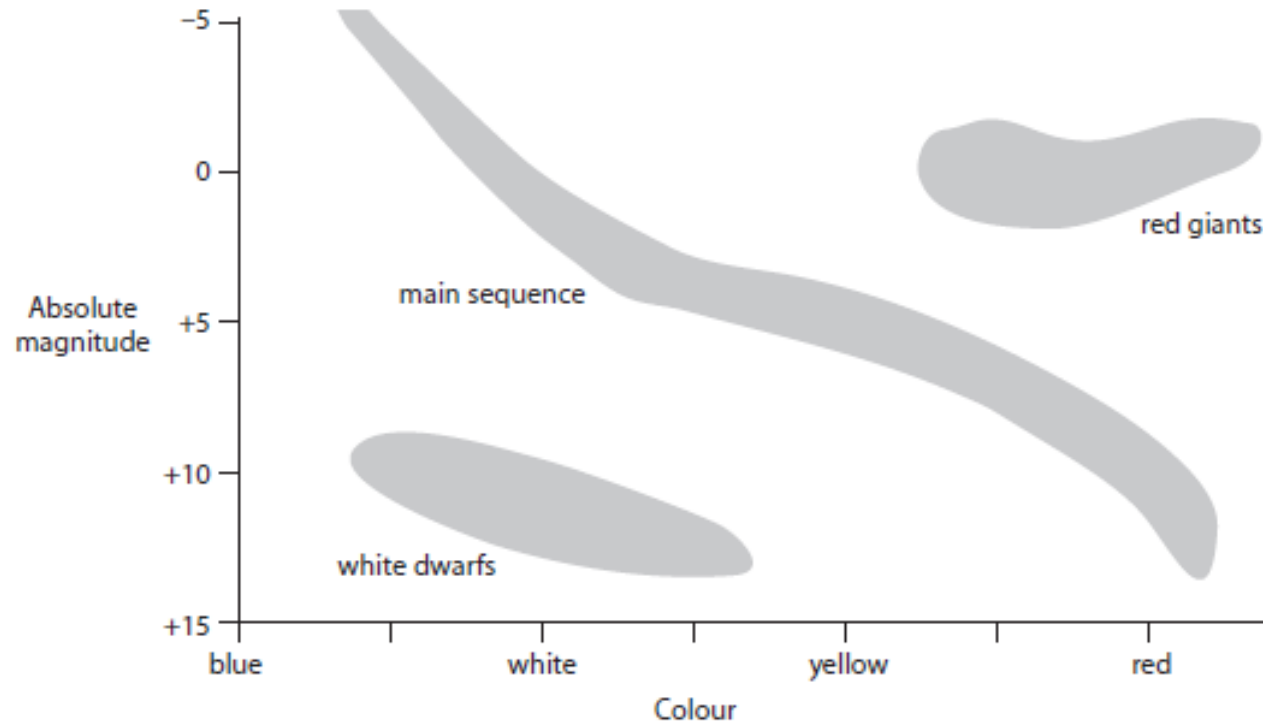
Almost 25% of students could not name the independent variable in **Q6ai**. This just needs practice: the variable that you choose to vary is the independent variable, the one that you have to alter or measure as a result is the dependent variable.

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

<https://qualifications.pearson.com/en/qualifications/edexcel-international-gcses-and-edexcel-certificates/international-gcse-physics-2017>



## International GCSEs and Edexcel Certificates Physics (2017)



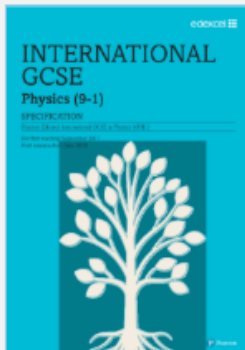
Specification

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### Specification



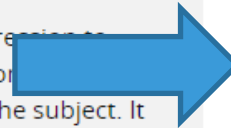
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First teaching: **September 2017**

First external assessment: **2019**


Our Pearson Edexcel International GCSE (9-1) Physics specification and support materials have been developed with the help of teachers, higher education representatives and subject expert groups.

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## June 2019



Question paper - Paper 1P - June 2019

Paper 1P

| PDF 1.3 MB | 02 Jul 2019



Modified papers - 4PH1 - June 2019

Modified papers to help candidates with varying needs to access past examination materials

| ZIP 11.6 MB | 26 Sep 2019



Mark scheme - Paper 1P - June 2019

Paper 1P

| PDF 220.7 KB | 22 Jul 2019



Examiner report - Paper 1P - June 2019

Paper 1P

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Paper 1PR

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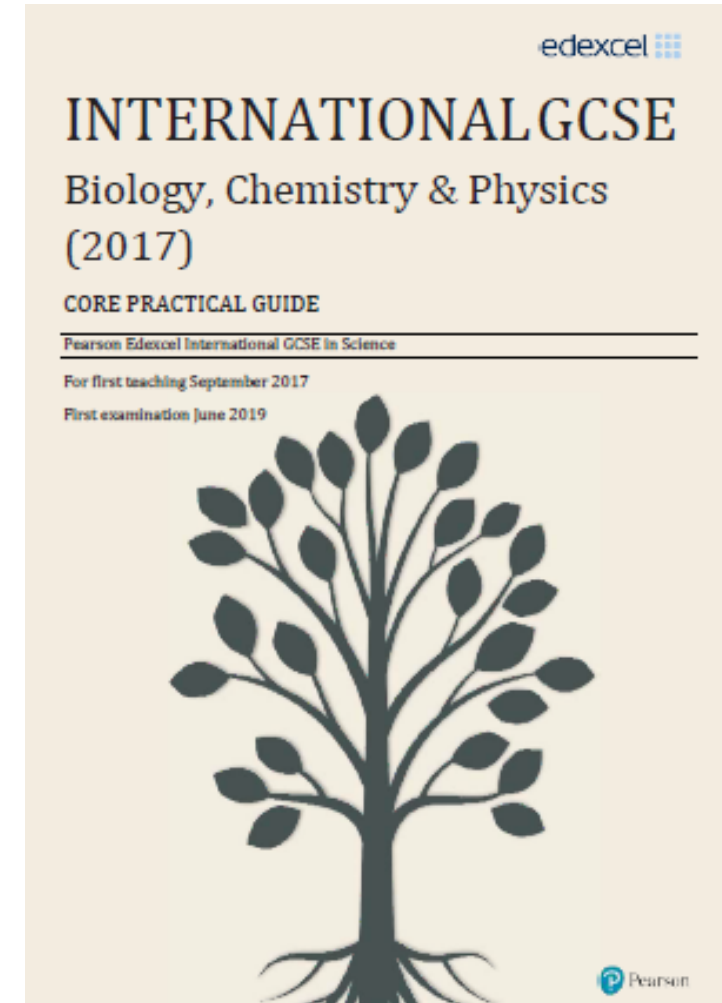


FEEDBACK

# 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



# 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  $1/\text{period}$ .

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:**

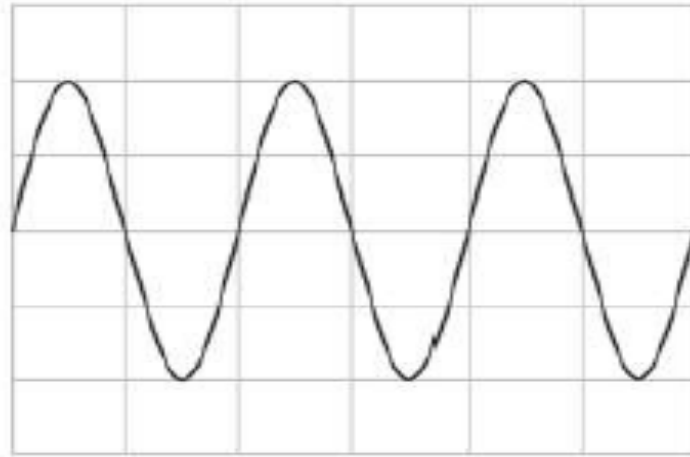
- Can you demonstrate that the source of sound is still emitting even though you cannot hear it?
- What is the maximum and minimum frequencies that can be heard by members of the class? Why is that range different for the teacher and the students?
- Why are those maximum and minimum frequencies different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

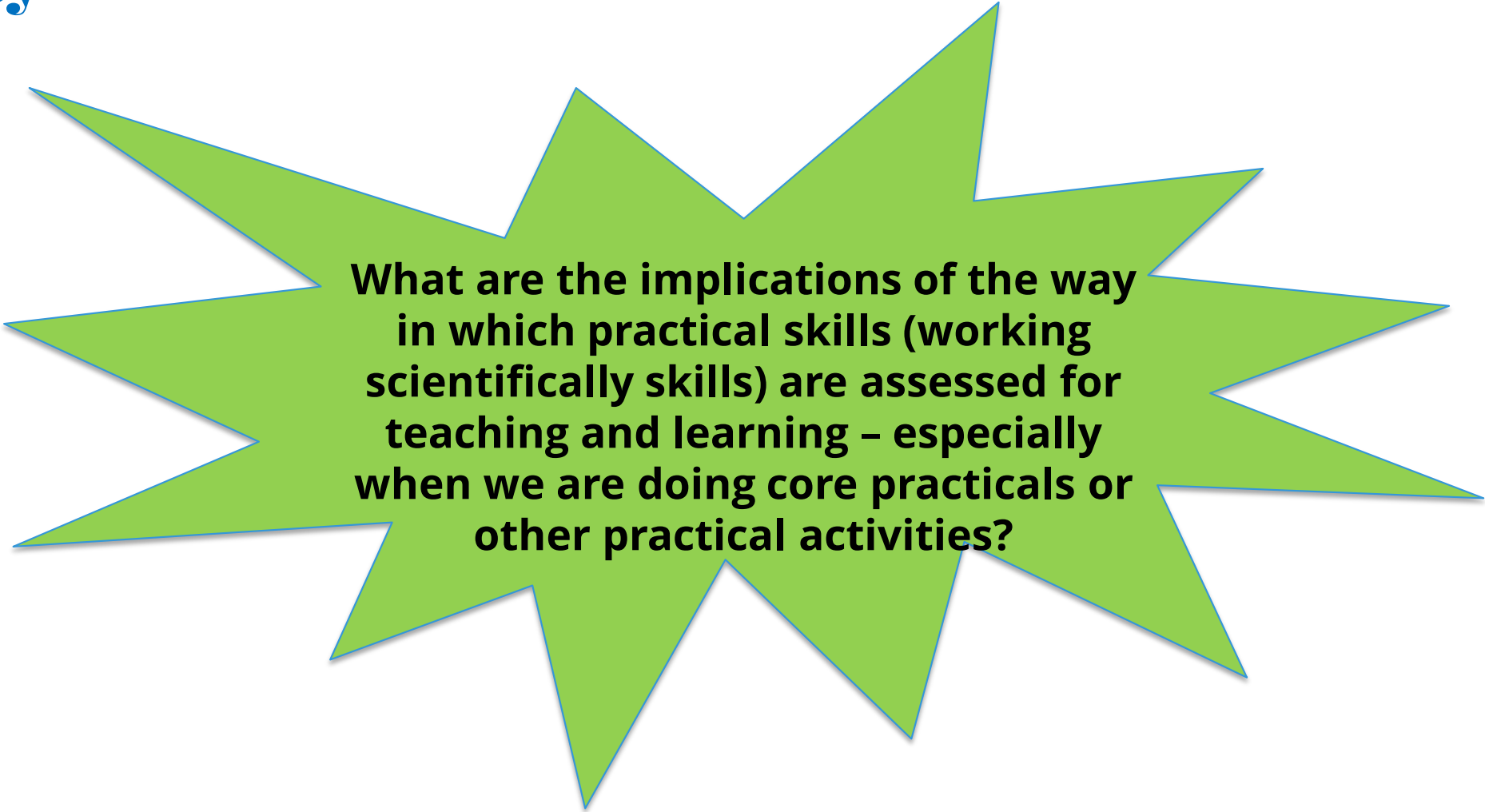
Frequency = \_\_\_\_\_ Hz

# Example: Core practical 7 - Frequency of Sound

Question number	Answer	Accept	Reject	Marks
(a) (i)	3;	Three /3.0		1
(ii)	0.002 (s) / 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.

# Activity




**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?**

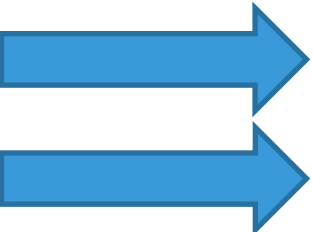
# Exam technique

# The exam paper

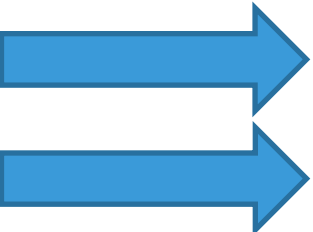
## Instructions

- 
- 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

# Support from Pearson

# Online Teaching and Learning support and Assessment support

You can type all of this link into your browser:

<https://qualifications.pearson.com/en/qualifications/edexcel-international-gcses-and-edexcel-certificates/international-gcse-physics-2017>

or (easier!) type:

**'Pearson International GCSE'** into a search engine (e.g. Google) and then choose **'Physics'** (all subjects arranged alphabetically)

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# Personal support



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[➤ Download the guide !\[\]\(488d36215f31304317ffb20d512ebb61\_img.jpg\)](#)

# Subject advisor details

Keep up to date

Irine Muhiuddin

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**Useful link :** Please have a look at your new  
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# Published resources

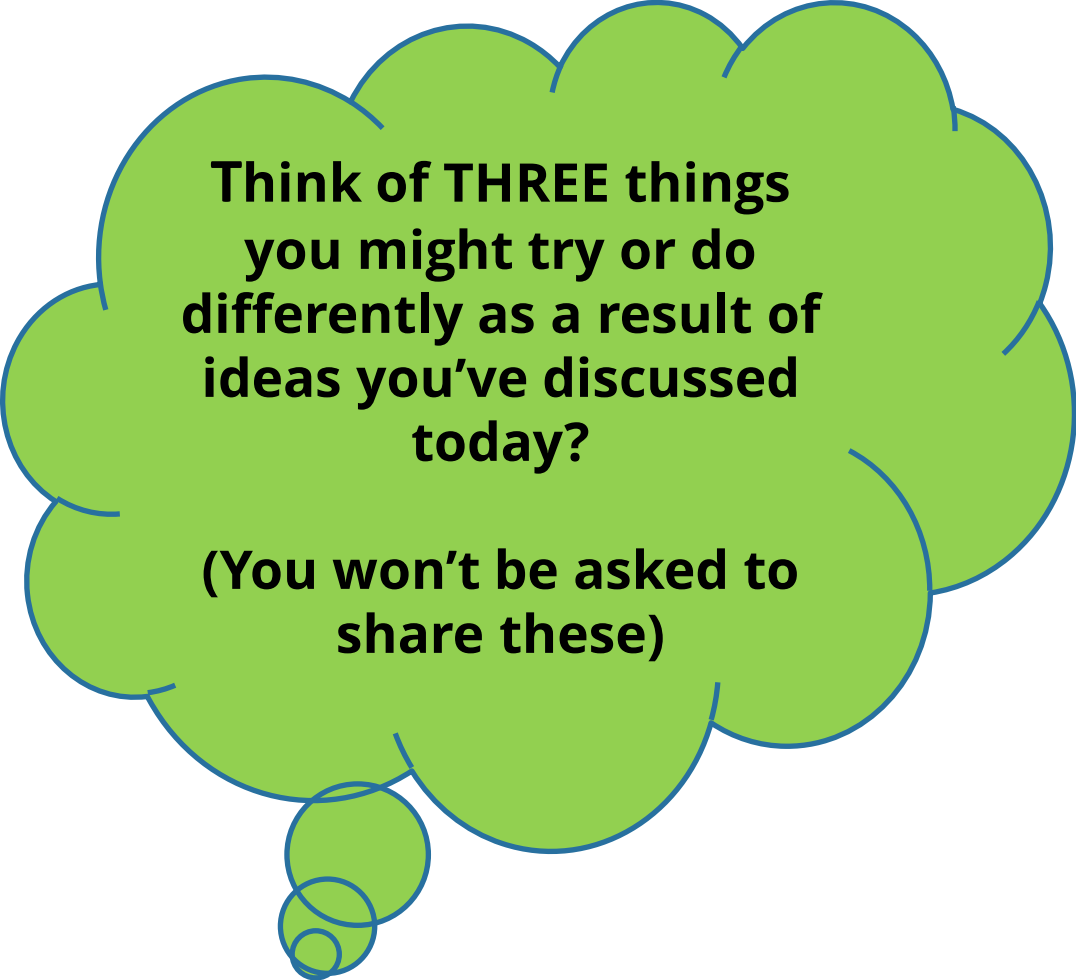
We are committed to helping teachers deliver our Pearson Edexcel qualifications and helping students to achieve their full potential.

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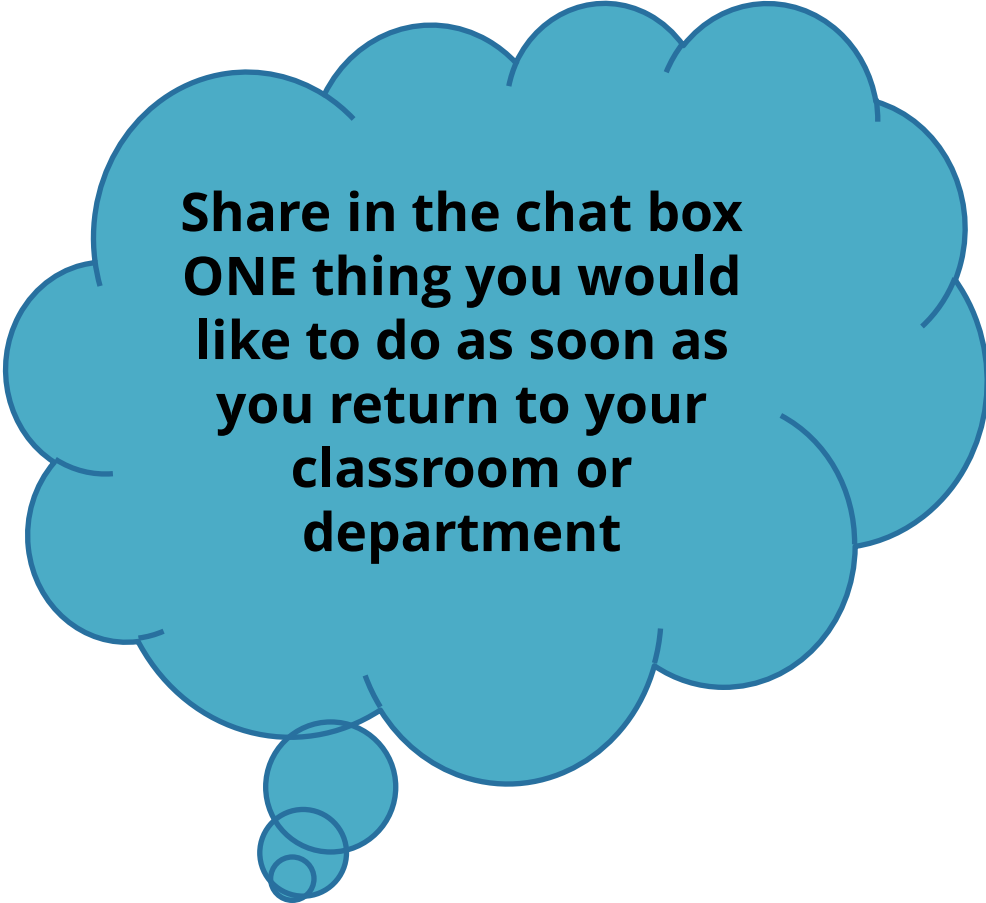
# Evaluation and next steps

# Next steps

A large green thought bubble with a blue outline and three smaller green circles at the bottom left.

**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)**

A large blue thought bubble with a blue outline and three smaller blue circles at the bottom left.

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

# Evaluation

Please fill in an evaluation form

Thank you for participating

Find out more about us at:  
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