

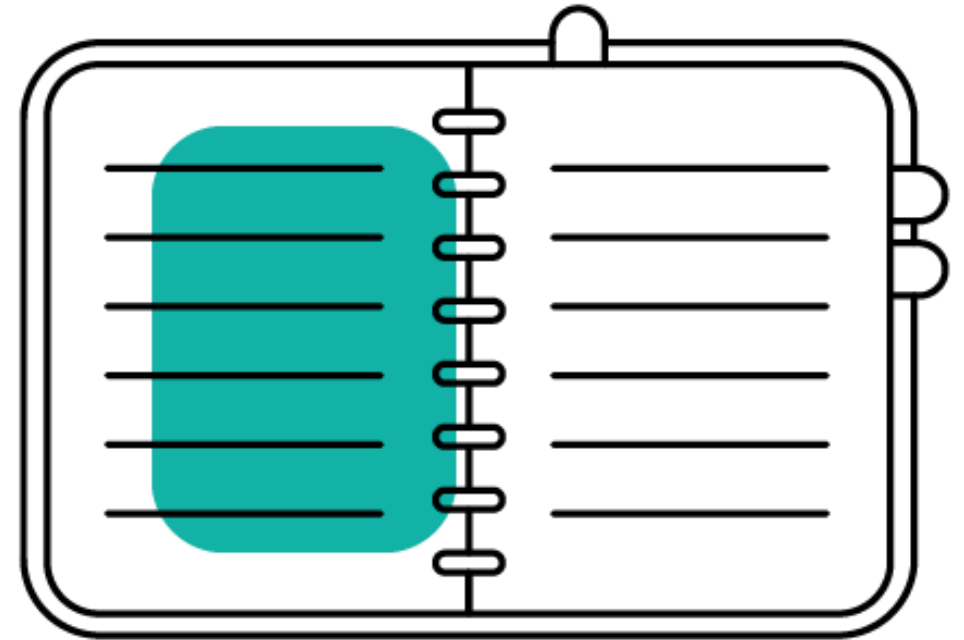
GCSE Combined Science

2024 Autumn
Networking Event



Agenda

1. Welcome and Introductions
Tosin Oliyide (Senior Qualifications Manager)
2. Key Qualification Resources Updates
3. Supporting Learners with EAL or Literacy Difficulties in Science
Paula Bull (Expert Teacher)
4. Upcoming Trainings and Further Support
Irine Muhiuddin (Science Subject Advisor)



Getting to know you



Question

How long have you been teaching Pearson Edexcel GCSE Science?

Question

How confident do you feel about supporting learners with EAL or Literacy difficulties?

Question

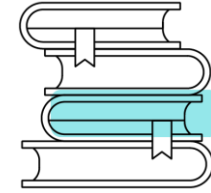
How familiar are you with our specification updates and resources event?

Key Qualification Resources Updates

Tosin Oliyide



Assessment accessibility work



Emphasis on
Plain English

Scaffolding
Question

Improved
layout and
readability

Reviewed by
language
experts

Reducing
complexity

Modified
papers

Regularly
reviewing our
Work

Read more about this here:

[gcse-science-accessibility.pdf \(pearson.com\)](https://www.pearson.com/gcse-science-accessibility.pdf)

Edexcel GCSE (9-1)
Science

Pearson
Edexcel

Accessible assessments for all

Accessible Assessments - a guide to our question paper improvements in 2024.

As part of our commitment to continuous improvement of assessment, we have taken steps to refine our papers to improve the examination experience for all students.

Here are some of the steps we have taken to make our papers more accessible and inclusive.

Emphasis on plain English
We take great care to use plain, everyday English as much as possible, even within a scientific context. This helps students to understand complex concepts and ideas.

Scaffolding questions
Where necessary, we 'scaffold' questions, especially those with multiple marks, to help guide students towards what is required. This is particularly important in 6-mark questions.

Improving layout and readability
We start new sentences on a new line to make our papers easier to read. We also embolden key words to guide students towards what needs to be done.

Modified papers
Modified papers help ensure that candidates with varying needs can access the examination materials needed to accurately assess their skills and knowledge. There is a variety of formats available, each of which aims to accommodate a range of difficulties.

Reviewed by language experts
We work closely with a language expert who reviews all our materials to ensure that our papers are clear and easy to understand.

Reducing complexity
This helps keep our language simple, and easy to understand, making them more accessible to students of all reading levels.
We have reduced the word count and sentence length within our papers. This makes our papers as concise and straightforward as possible, without compromising the quality of the content.

Reviewing our work
Every year, after the examination period, we evaluate our papers. Every question is reviewed to assess its effectiveness.
We are committed to making our materials accessible to all students.

Find out more about accessible assessments >

One-mark starter questions



Question

In an experiment, powdered calcium hydroxide was added to dilute hydrochloric acid and the pH was measured.

The method used was

step 1 measure 200 cm^3 dilute hydrochloric acid into a beaker

step 2 add 0.1 g of powdered calcium hydroxide to the beaker

step 3 find the pH of the mixture

step 4 repeat steps 2 and 3 until the pH stops changing.

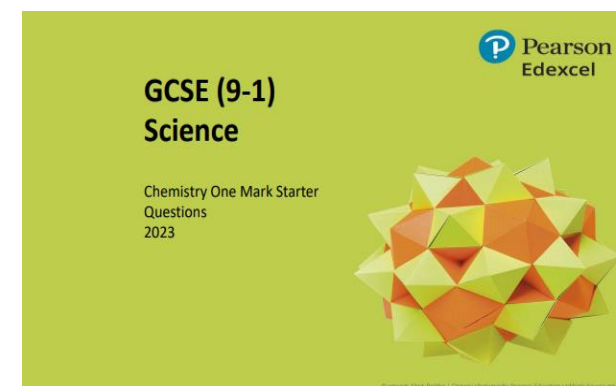
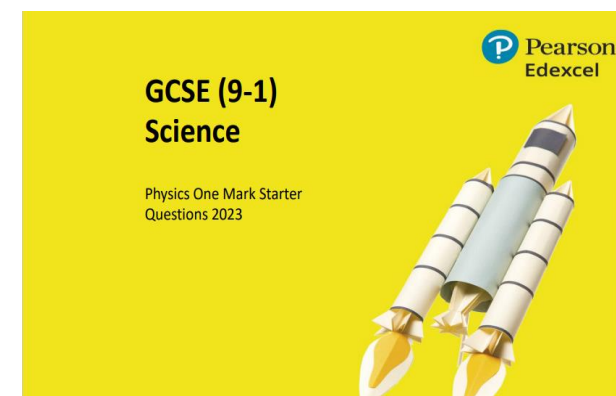
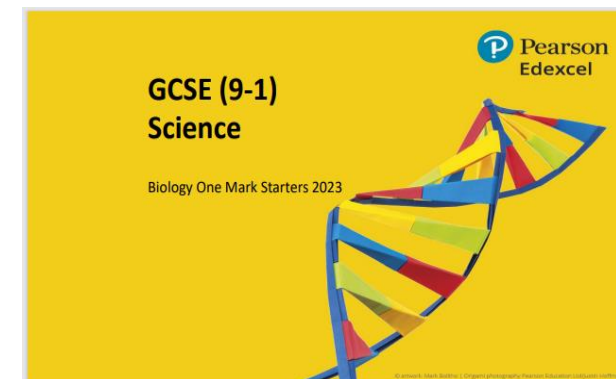
(a) State what should be done after **step 2** to make sure that any reaction is complete.

(1)



Mark Scheme

Question number	Answer	Additional guidance	Mark
1(a)	asexual (reproduction)	ignore mitosis reject meiosis accept cloning / binary fission	(1)



Maths in science

- Maths in Science question papers

Please check the examination details below before entering your candidate information

Candidate surname Other names

Centre Number Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

(Time: 1 hour 10 minutes) Paper reference **MIS/F**

Mathematics in Science

Foundation Tier

You must have: Ruler, calculator

Total Marks

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*.
- Calculators may be used.
- Diagrams may not be accurately drawn, unless otherwise indicated.
- You must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question*.
- In questions marked with an **asterisk(*)**, marks will be awarded for your ability to structure your answer logically, showing how the points that you make are related or follow on from each other where appropriate.
- A list of equations and a periodic table are included at the end of this exam paper.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Edexcel GCSE Sciences (2016) | Pearson qualifications

- Maths guide - 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.

How would you enter the value

1×10^{-15}

into this scientific calculator?



Obviously, you start with the number 1



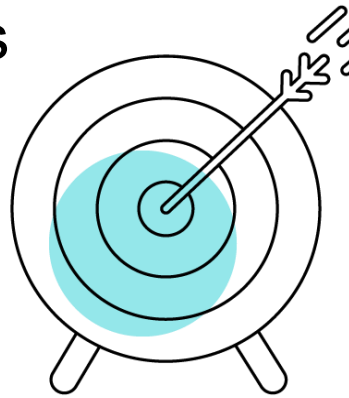
Supporting practical delivery

Practical Worksheets on:

- apparatus
- Glossary
- safety

Each of these document contain:

- description, image and diagram
- exam questions & mark schemes
- questions for students to try



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Specification Course materials Published resources Teaching support ▾ Switch to Pearson 2024 Support

🏠 > Our qualifications > GCSEs > Sciences (2016)

Pearson Edexcel GCSE Sciences 9-1 (2016)
Sciences (2016)

News


Why choose our specification?

Assessment and tracking progress

Training and events

New interactive scheme of work

Case studies >



The Science Emporium Engage with like-minded professionals > **Discover your support**

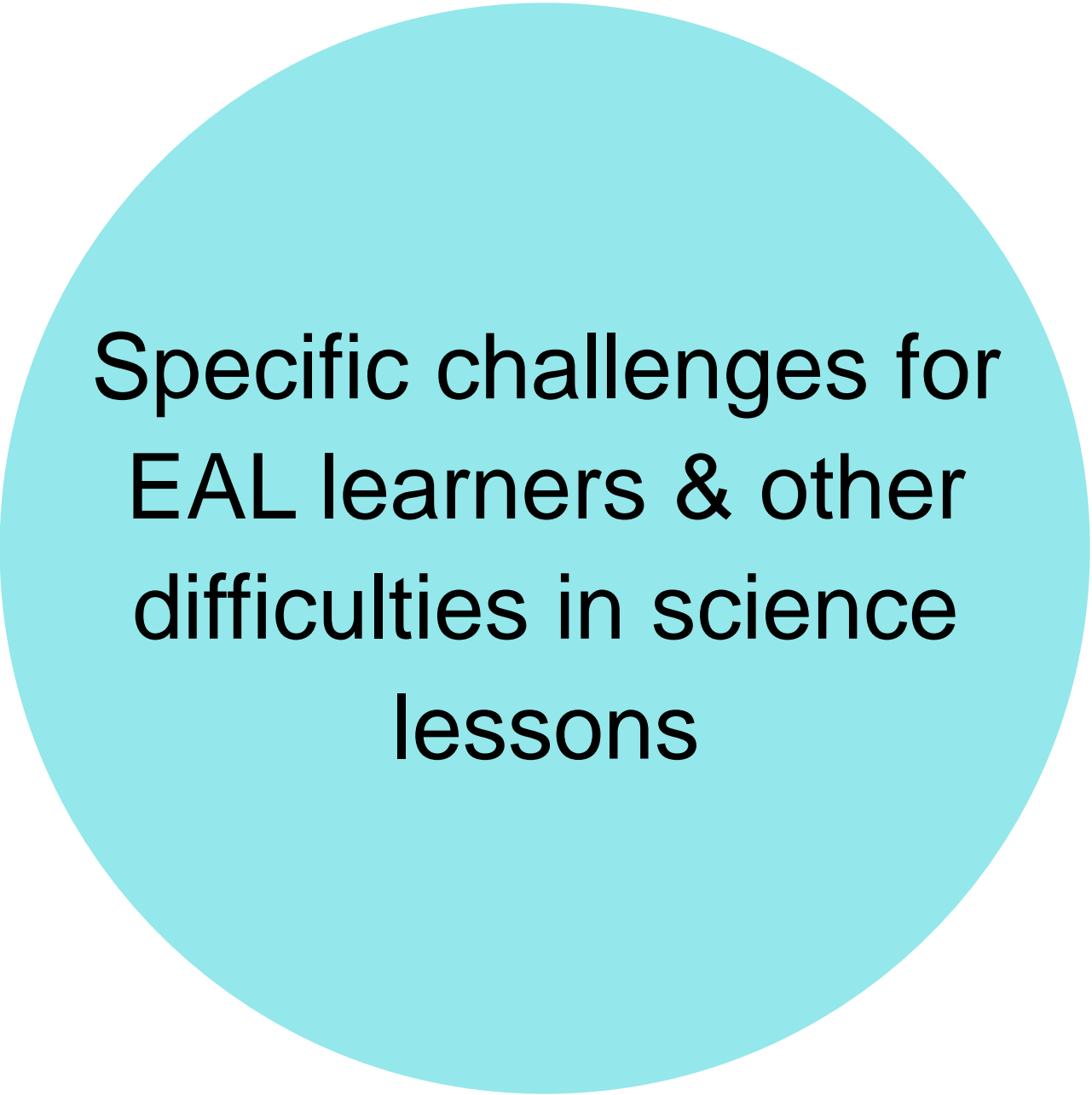
Supporting Learners with EAL & Literacy Difficulties in GCSE Science

Paula Bull



Expected outcomes

- Explore evidence-based and effective strategies to support learners with literacy difficulties in science.
- Explore practical ways to develop scientific vocabulary needed for GCSE science.
- Look at strategies for planning and answering extended writing questions.



Specific challenges for
EAL learners & other
difficulties in science
lessons

Poll Everywhere



pollev.com/paulabull541



Barriers to learning science

Difficulties

- Less accessible than other subjects
- Highly abstract language
- Complex sentence structures
- New subject vocabulary
- Requirement to write explanations & justifications
- Disparity in prior knowledge

Positives

- Opportunities for language development
- Collaborative activities
- Communication opportunities

What are the challenges for EAL learners & other difficulties in science lessons?

Word level

Unfamiliar vocabulary encountered – subject specific words

- Object word examples, artery, granite
- Processes examples, evaporation, photosynthesis
- Concepts examples, energy, force

Subject-specialised words – a different meaning in everyday language

- sounds being softer, cells, function

Synonyms – words with a similar meaning

- Membrane & skin, friction & resistance

General academic words

What are the challenges for EAL learners & other difficulties in science lessons?

Sentence level

Unfamiliar sentence structures

- Use of passive voice which often uses more words, sounds less impersonal. E.g. '*Yield is improved by using process X*'
- Pragmatic function of modal verbs to express uncertainty, e.g. 'may be reflected in could relate to ...'
- Comparative structures, describing relationships between variables, e.g. 'the higher the temperature the faster moving are the particles'

What are the challenges for EAL learners & other difficulties in science lessons?

Text level

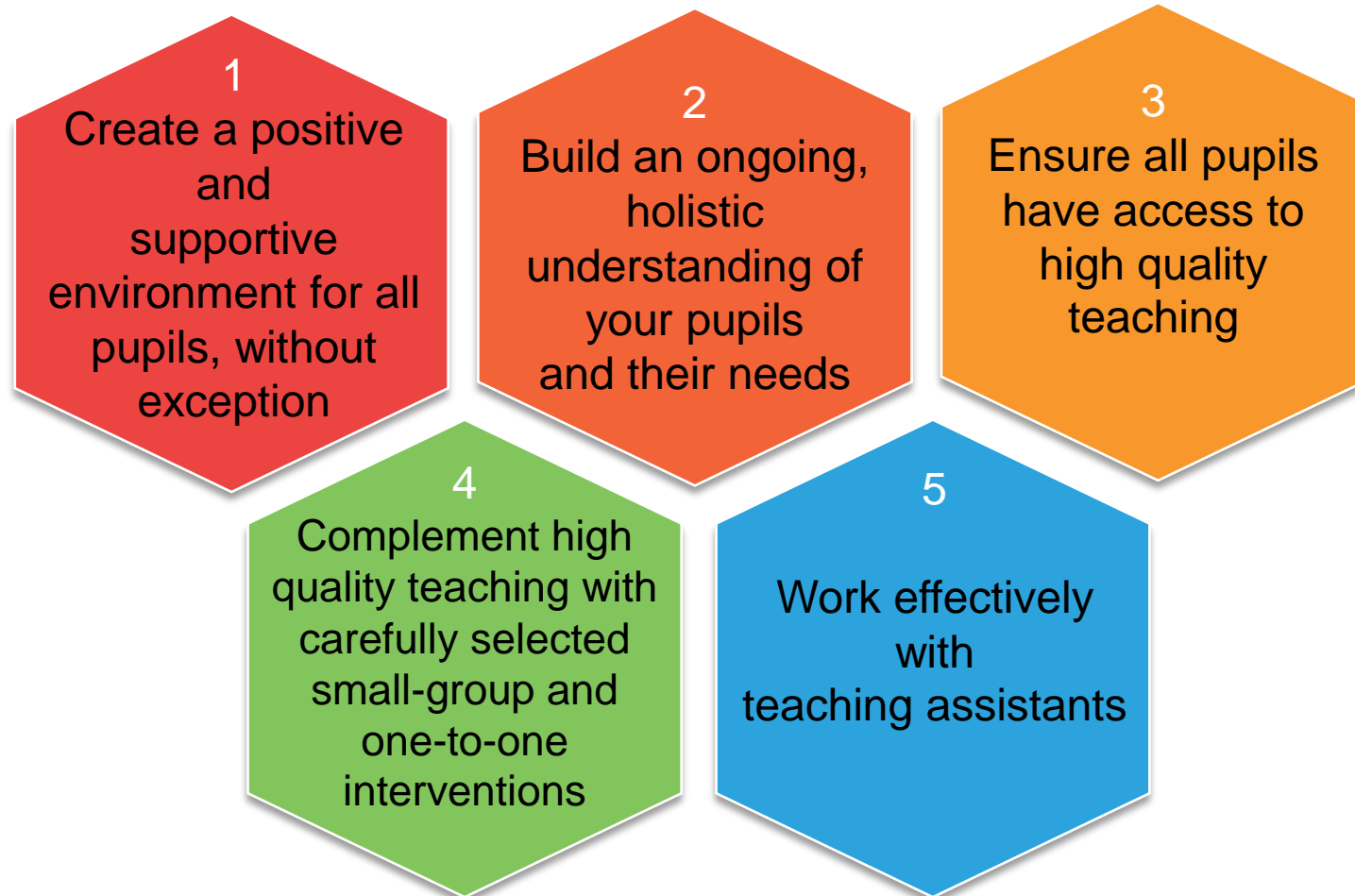
Difficult structure

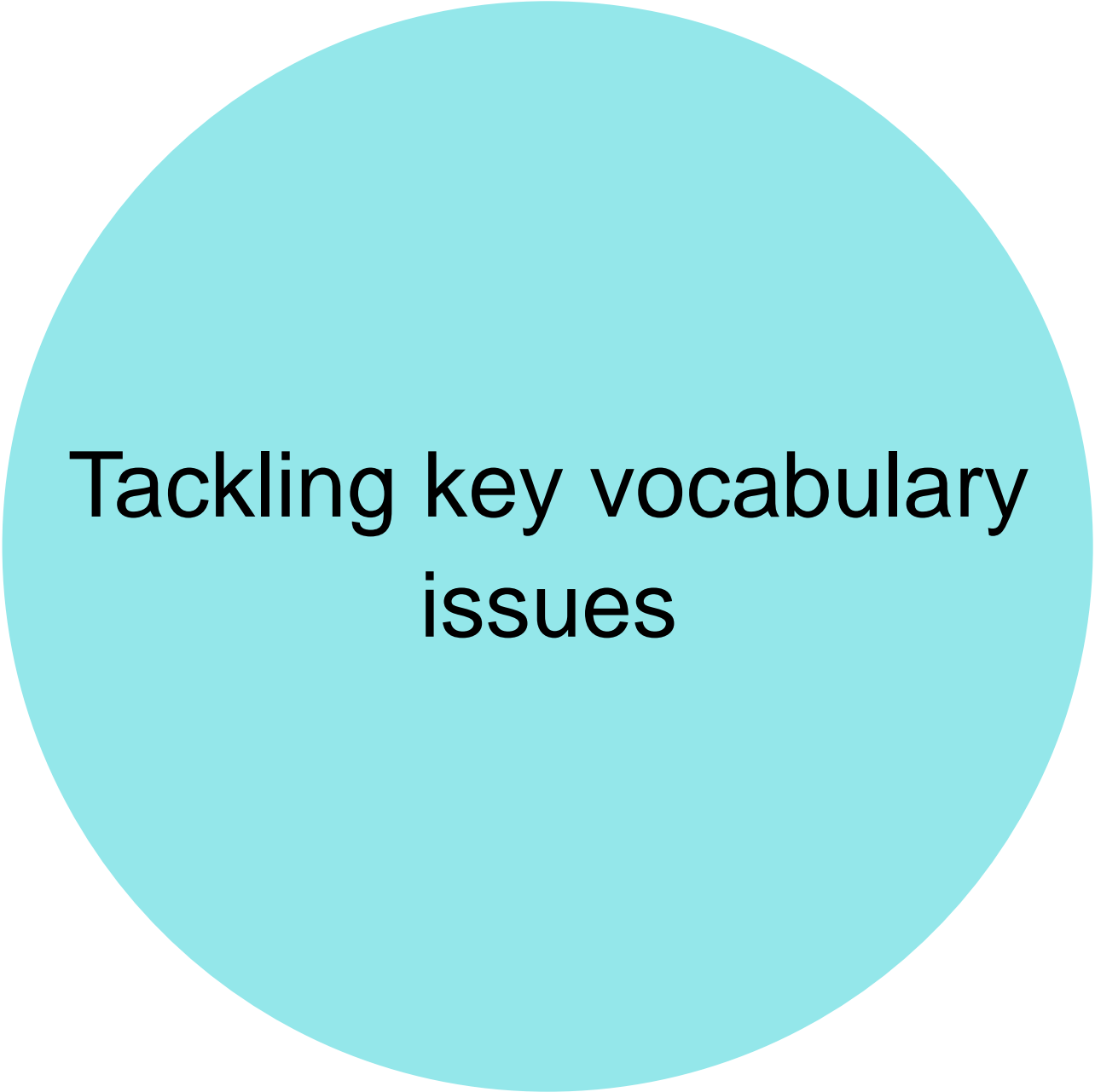
'In formal science writing, information is densely packed: a lot of content is packed into a small amount of text.' (Driver, 2017)

Complex noun phrases to represent processes e.g. the term 'premature birth rate' could mean:

- The proportion of babies born prematurely
- How prematurely babies are born
- How many babies are born prematurely

EEF Summary of recommendations (SEN)





Tackling key vocabulary
issues

Key issues regarding vocabulary

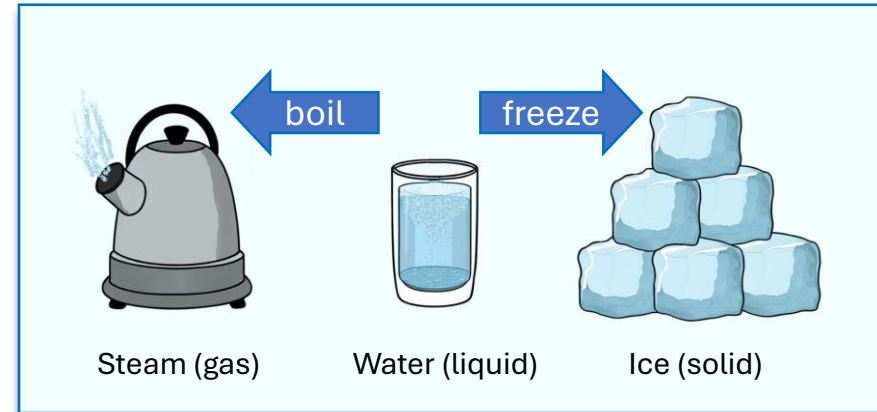
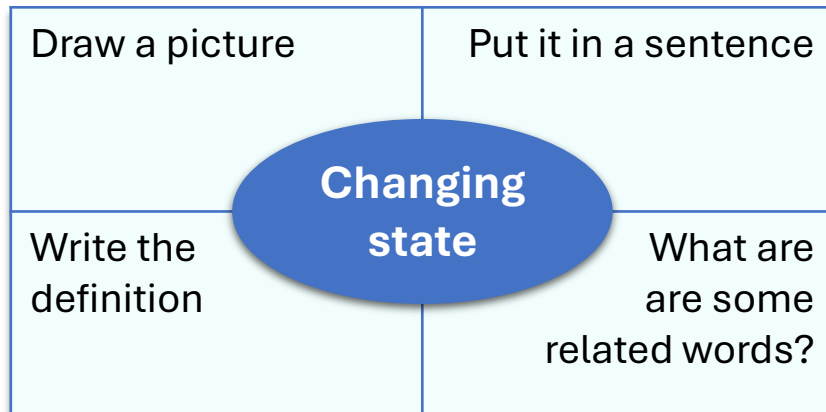
Issue	Example	Suggested teaching strategy
A word with a different meaning in everyday life	Biology: Tissue, culture, cell Physics: Force, cell, power Chemistry: Salt, solution, reaction	Ask pupils to construct two separate sentences, each representing the different meaning of the word: a) He sneezed and needed to use a tissue b) Tissues are made from similar cells
Words are difficult to remember	Photo – light Synthesis – put together Homo – same; alike Hetero – different; other	Encourage pupils to discover the word roots and write these down as well as the meaning of the word. Refer pupils to the glossary.
Pupils' use of idioms and the literal meaning	Headline / title to a piece of text on GM foods: "Food under the microscope"	When reviewing content prior to learning, note down and draw attention to any of these.

Tackling vocabulary

- Science notebooks – include visuals as an aide memoir
- Four corners activity / The Frayer Model
- Keyword bingo
- Sound it out
- Word mats (inc. mother tongue)
- Diagrams
- Cloze activities – when water freezes it becomes _____



thermometer



Command words vocabulary

Practice makes perfect

- use command words during teaching, activities & EOT tests
- classroom displays (request from <https://qualifications.pearson.com/en/forms/supporting-success-in-science.html>)
- students to create own questions and mark schemes
- shared examples - include contrasting answers with similar command words

Examples:

Not

'why do the halogens get less reactive as you go down group 7'

Use

'explain why the halogens get less reactive as you go down group 7'

Command words vocabulary

Contrasting answers

Describe how the growth of bacteria at 10°C was different from the growth of bacteria at 20°C

Explain

(ii) Figure 8 shows the inheritance of cystic fibrosis in a family.

F represents the dominant allele that does not cause cystic fibrosis.

f represents the recessive allele that causes cystic fibrosis.

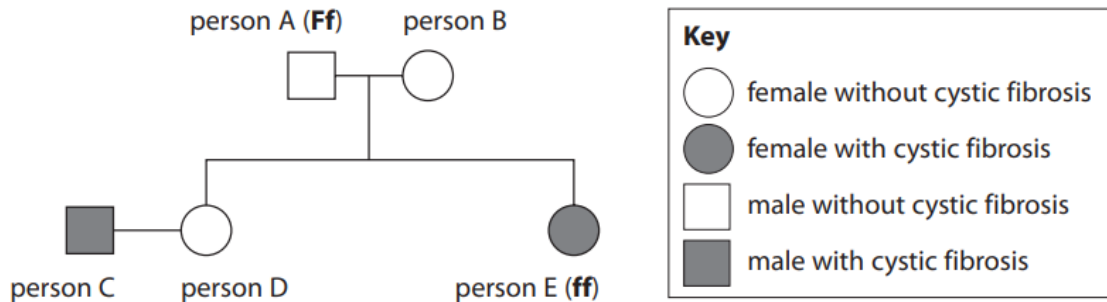


Figure 8

A scientist states that the genotype of person B is **Ff**.

Explain why the scientist is correct.

(2)

Question number	Answer	Additional guidance	Mark
1(c)(iii)	<p>A description including two from:</p> <ul style="list-style-type: none"> 10 °C is slower (than growth at 20 °C) (1) 10 °C is linear /straight (1) 10 °C does not level off (1) supported by manipulated data (1) 	<p>accept 10 °C is below / less (than the 20 °C line)</p> <p>differences must be in 1000s</p> <p>accept reverse arguments for 20 °C</p>	<p>(2)</p> <p>A03</p> <p>1a 1b</p>

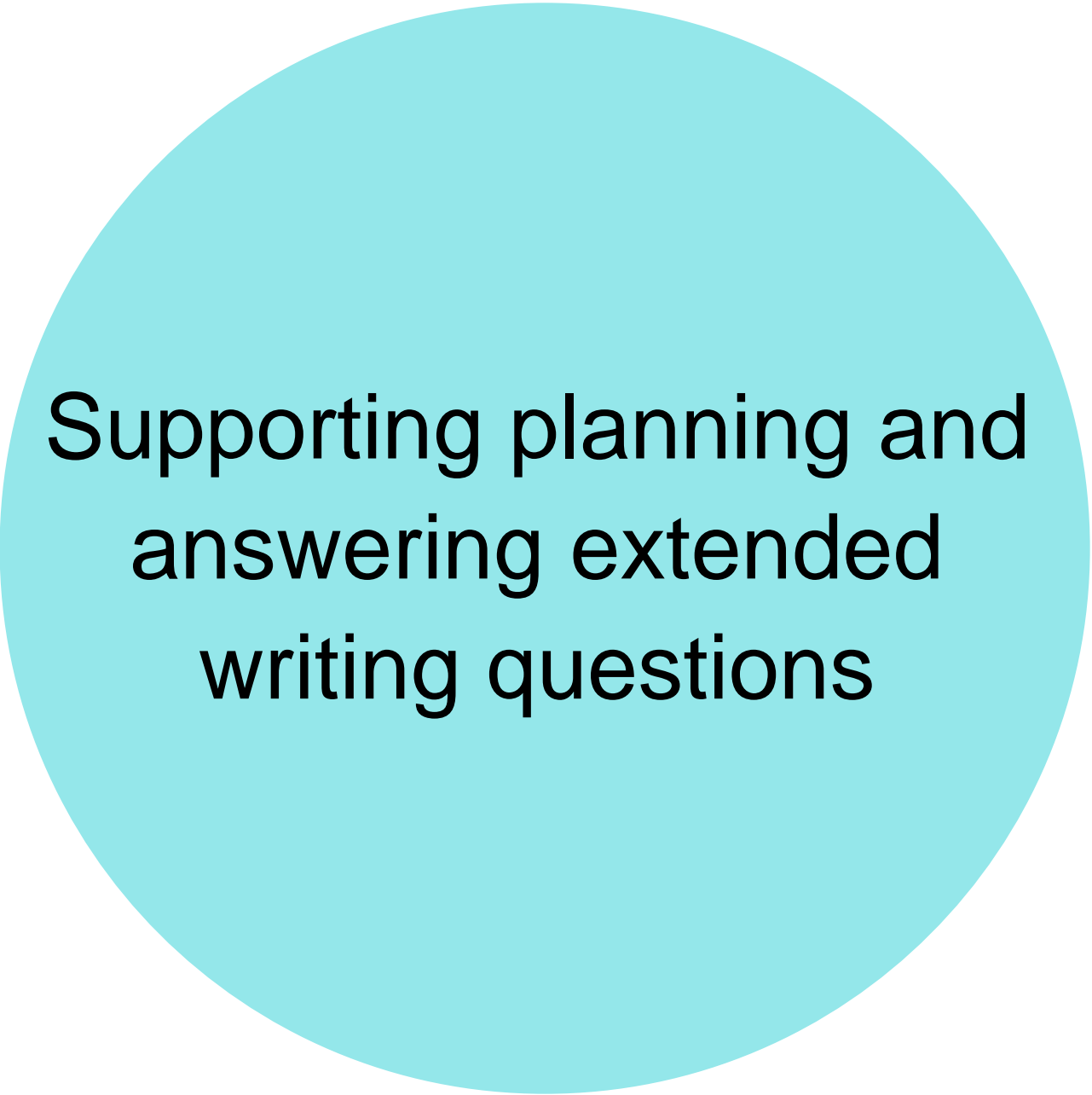
Question number	Answer	Additional guidance	Mark
4(c)(ii)	<p>An explanation including:</p> <ul style="list-style-type: none"> person B must have an F allele because she does not have cystic fibrosis (1) person B must have an f allele because person E must have inherited an f allele from her (1) 	<p>accept because person E is ff / homozygous recessive</p>	<p>(2)</p> <p>A02 2</p>

Activity 1

- 💡 Think of a specific class with students with EAL or SEN vocabulary difficulties.
- 🕒 Take two minutes to think, then type in your comment in the Zoom chat box.
- ➡ Do not press enter until told to do so!

What strategies that we discussed are you currently using?

Which one strategy are you going to try?



Supporting planning and
answering extended
writing questions

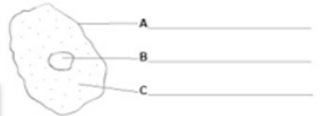
Sentence structures

- Sentence starters
- Pair with other mother speakers during investigative work
- Talking prompts
- Visuals to contextualise the learning
- Sequencing
- Gap-fill tasks

Edexcel GCSE (9-1)
Sciences B1a.4 Cell structure – Homework

Name _____ Class _____ Date _____

1 This drawing is of a cell seen under a light microscope.



A _____
 B _____
 C _____

Edexcel GCSE (9-1)
Sciences B1b.2 Stem cells and specialised cells – Foundation

Name _____ Class _____ Date _____

The statements at the bottom of the sheet describe adaptations and functions of the four different specialised human cells shown in the top set of cards.

1 a Cut out the **Cells** cards and **Adaptations** statements. Place each statement next to the cell that it describes. (Note there are more adaptations for some cells than for others.)
 b Cut out the **Functions** statements. Arrange them so that each function matches one **Adaptation**.
 c Compare your arrangement of cards with those of other students. Try to agree the best arrangement.

F1 For each of these cells, describe one way in which they are adapted to their function:
 a egg cell, b sperm cell, c nerve cell, d muscle cell.

2 The text below is about **stem cells**. Complete the text by writing the correct word from the box in each space.

adult any grows specialised repair un specialised

A stem cell is an _____ cell. It divides to make more stem cells and cells that **differentiate**.
Embryonic stem cells can differentiate into _____ type of _____ cell that is found in a baby.
 A few _____ stem cells are found in differentiated tissue. Their function is to produce more differentiated cells as the tissue _____. They can also produce differentiated cells for _____ if the tissue is damaged.

Cells	sperm cell	egg cell	muscle cell	nerve cell
Adaptations	long cell fibre	long tail	large store of nutrients in the cytoplasm	can shorten in length
	DNA from father	many branching connections at each end of cell	bag of enzymes at the front tip of the cell	DNA from mother
Functions	helps to move parts of the body, such as legs	so the mother's genetic material will be in all the baby's cells	link to other cells including many of the same kind of cell	provides energy for cell division and growth in the embryo
	so the father's genetic material will be in all the baby's cells	carries electrical impulses to other parts of the body	moves the cell through the female reproductive system	digests a hole in the egg cell membrane

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Write in the box on each writing line, to label the cell correctly.
 membrane cytoplasm nucleus

Complete the sentence with the name of the correct cell structure. The completed sentence should show the cell structure does.

_____ controls what goes into and out of the cell.
 _____ controls what happens in the cell.
 _____ is where many cell reactions take place.

Plant cells contain green structures called **chloroplasts**. Tick (✓) the box that shows the function of chloroplasts.


Photosynthesis takes place ☐ where substances are stored until the cell needs them
 Cell bursting ☐ where **photosynthesis** takes place

Write down other cell structures.

Cell	In animal cells?	In bacterial cells?	Function

Cells are studied with an **electron microscope**, not a light microscope.

Draw a diagram of a cell seen through a microscope, as shown in the image. The image shows a human fat cell at the _____.



_____ of the field of view? _____
 _____ of the fat cell, _____

Estimate things in this way, rather than doing careful measurements?

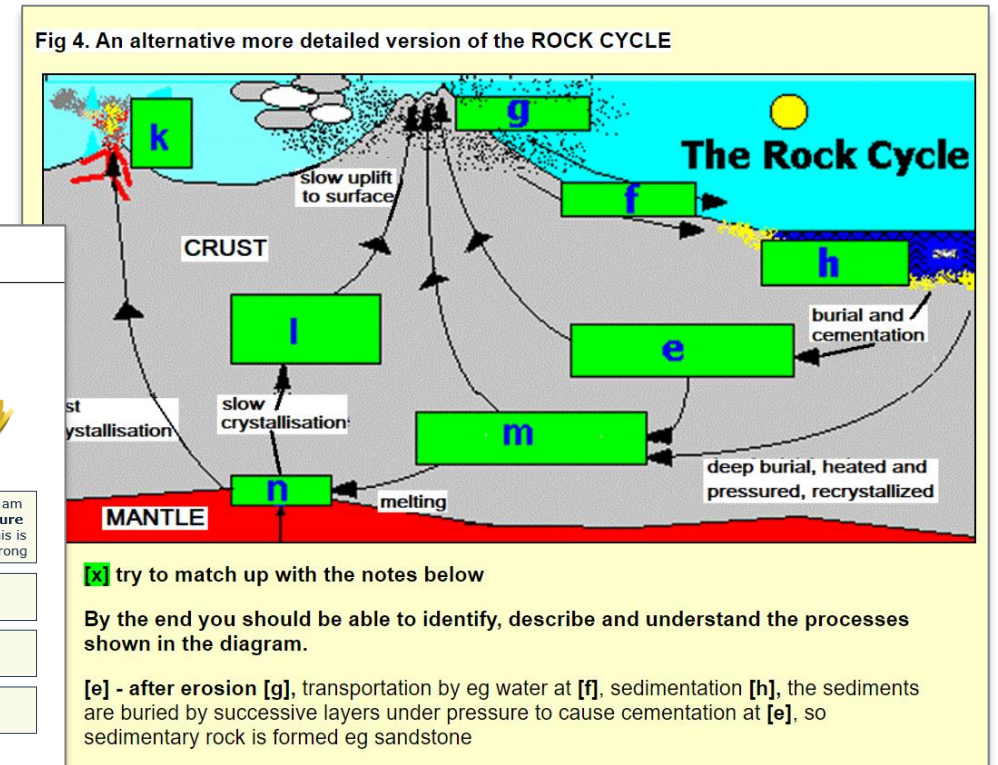
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Comprehension and texts

- Cartoons
- Scaffolding, including visual cues
- Confidence grids (BEST science teaching resources)
- Dialogic enquiry (Thinking science, University of Bristol)
- DART activities
- Deconstructing text

Name of part	Function	Location	Properties

Disease – cause and effect				
Part 1				
Eating fatty foods such as burgers is linked to heart disease.				
Look at the statements in the table.				
What is your decision for each statement?				
	I am sure this is right	I think this is right	I think this is wrong	I am sure this is wrong
1	You will definitely get heart disease if you eat fatty foods.			
2	Eating fatty foods makes it more likely that you will get heart disease.			
3	Eating fatty foods increases your risk of getting heart disease.			



Example of a GCSE question and how to teach pupils to answer the question

*(ii) Figure 15 shows a diagram of light entering an eye of someone who cannot see distant objects clearly.

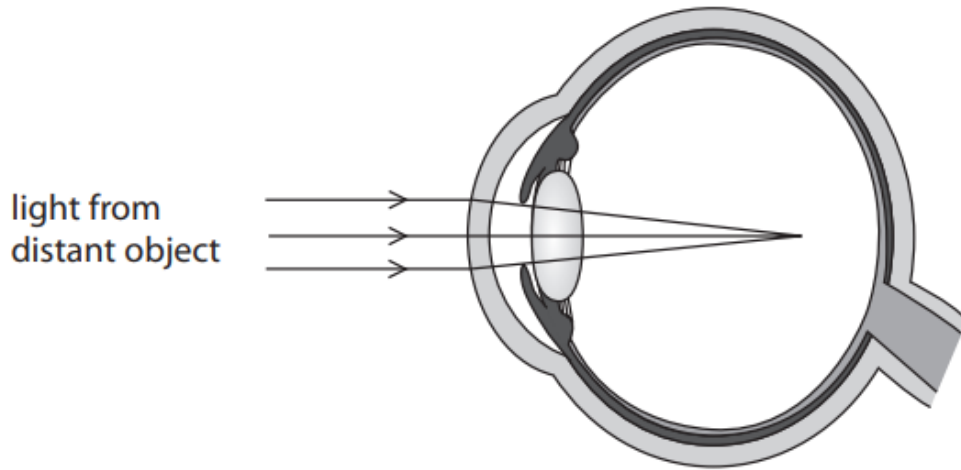


Figure 15

Explain why this person cannot see distant objects clearly and how the problem can be corrected.

Scaffolding:

Break the question down

Circle key words in the text

Make notes on what you know

Plan your answer

Why can't they see distant objects clearly?

- Short sighted
- Cornea too curved / convex (light bent and focused at front of retina)

How can the problem be corrected?

- Glasses to make the light meet at the retina
- Lenses needs to be concave
- Cornea needs to be less convex (laser treatment)

(6)

Example of a GCSE question and how to teach pupils to answer the question

When a person is infected with a disease, the immune system will respond to protect their body.

Explain how the immune system will respond to an infection caused by bacteria.

Scaffolding:

Break the question down

Circle key words in the text

Make notes on what you know

Plan your answer

AO2		(6)
Area A	<ul style="list-style-type: none">antigens are on the bacteriawhich are detected by WBCs / phagocyteswhite blood / phagocytes engulf bacteria (phagocytosis)swelling / inflammation of tissues / fever	AO1 1
Area B	<ul style="list-style-type: none">number of white blood cells increasesantibodies are producedby lymphocytes / white blood cellsantibodies surround / cover / inactivate the antigens / pathogens	
Area C	<ul style="list-style-type: none">memory lymphocytes / cells are producedwhich remain in the bloodthen if a secondary infection occursmemory lymphocytes produce antibodies faster / in greater numbersso the bacteria / pathogens are destroyed faster	

Discussion and Q&A



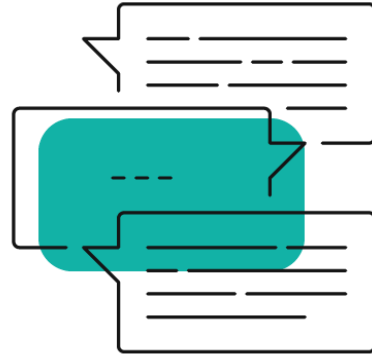
Upcoming Training and Further Support

Irine Muhiuddin



Subject Advisor Support

Irine Muhiuddin Science Subject Advisor is here to support you throughout the year.



You can sign-up to receive [regular updates](https://qualifications.pearson.com/en/forms/subject-advisor-updates-for-teachers-and-tutors.html) from your Subject Advisor on qualification news and support

- <https://qualifications.pearson.com/en/forms/subject-advisor-updates-for-teachers-and-tutors.html>.

Email: Teachingscience@pearson.com



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centres and
networks of
schools



<https://support.pearson.com/uk/s/qualification-contactus>

teachingscience@pearson.com

Summer 2024 Exam Insight events

- Receive feedback on summer exams
- Key points from examiner reports
- Consider statistical performance data
- Explore why performance varies
- Address common issues & FAQs
- Recordings will be available

Question 3 (d)

Candidates were asked to describe how the heart causes the blood to move to the lungs.

This proved to be an easy one mark with about half the candidates stating that the heart contracts / beats or pumps/pushes blood to the lungs. The 'beats' being a generous acceptable alternative to contract. Three marks was not common but seen regularly with candidates saying the heart **contracts** / **beats**, which **pumps** / **puts pressure** on the blood / forces blood out of the heart, down the **pulmonary artery** to the lungs.

(d) Describe how the heart causes blood to move to the lungs.

(3)

When the heart beats, muscles inside the heart contract to force blood out of the heart, then relax to let de-oxygenated blood into the heart. The process repeats many times a minute to ^{ensure} ~~cause~~ a constant blood flow to important organs, including the lungs. The de-oxygenated blood travels through the left atrium into the lungs due to the heart's contraction of muscles.



A good understanding at foundation level of how the heart moves blood around the body.

Summer 2024 Exam Insight events



- **GCSE Combined Science Biology:** 01 October 2024 at 16:00 – 17:30
<https://pearson.cventevents.com/event/6e12c8a8-b164-4ab3-9175-e60a08639da5/summary>
- **GCSE Combined Science Chemistry:** 15 October 2024 at 16:00 – 17:30
<https://pearson.cventevents.com/event/3c9c7ae9-682c-435d-848e-9fbb33664de7/summary>
- **GCSE Combined Science Physics:** 23 October 2024 at 16:00 – 17:30
<https://pearson.cventevents.com/event/058efc8d-76b6-4963-b8f5-8cd94c550ca5/summary>

GCSE Sciences: Marking Masterclass event



4 November 2024 at 16:00 – 17:30 GMT

<https://pearson.cventevents.com/event/5f954d9d-72ae-4ace-a530-be2652d2ca23/summary>

- This training session repeats the content from last year's 'Running and Marking Mocks' event.
- Look at student exemplars and how they should be credited using guidance from examiners.
- Discuss the different approaches to running, marking and moderating mock exams.

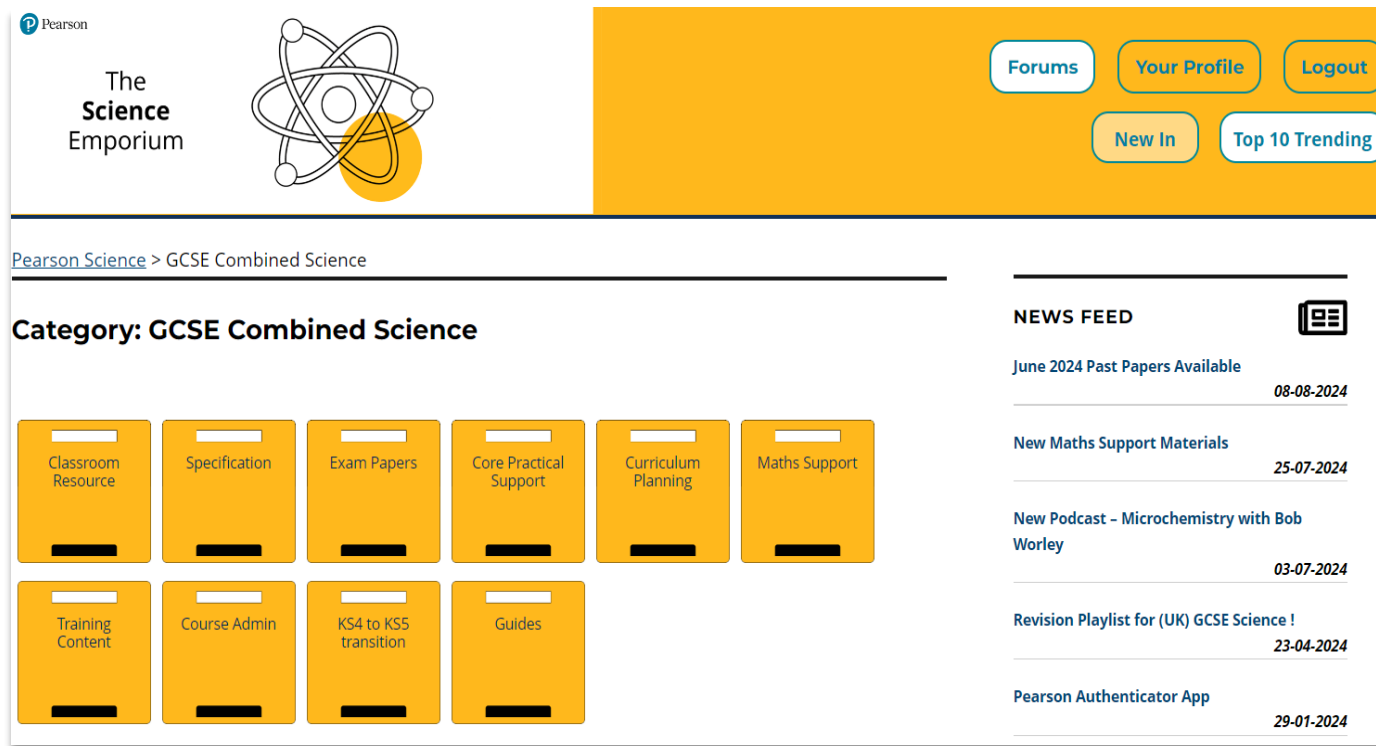


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Development Academy**
<https://pdacademy.pearson.com/>



The Science Emporium

- Join our community of like-minded teachers supporting each other at www.pearsonscienceemporium.com
- Get access to essential documents that are easy to find and download.



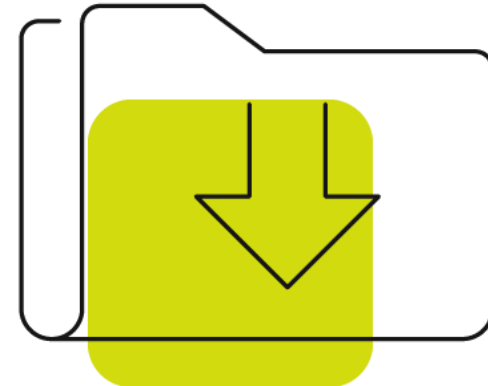
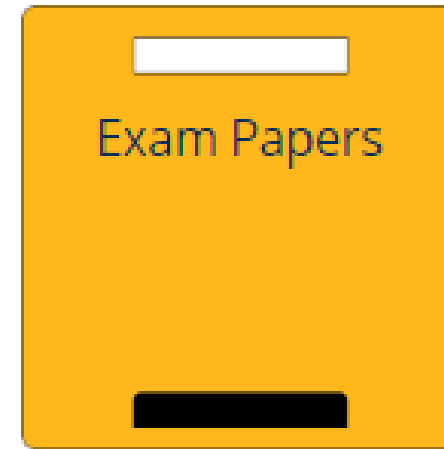
Who can apply?

- Teachers who have a Pearson Edexcel Online (EOL) login can apply for membership.
- The Exams Officer at your school or college can also organise a login on your behalf.

Summer 2024 exam materials available now via the Science Emporium...

Word versions of Summer 2024 question papers

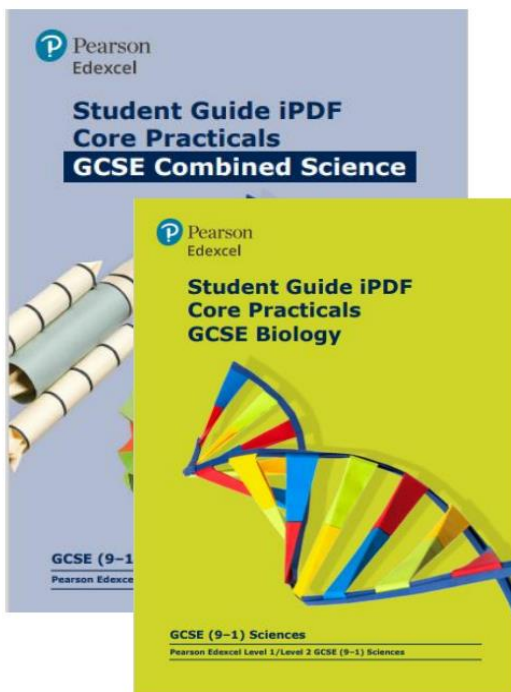
- As an added bonus this year our Summer 2024 papers are now also available for download as word versions in addition to the usual PDF.
- Edit papers in Word to create your own mocks and practice papers.
- Available now within the exam papers folder under **Word Version**.



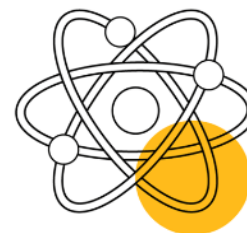
Core practical support also available on Science Emporium

Easy access to:

- Core practical teacher and student Guide iPDFs



The
Science
Emporium



[Pearson Science](#) > [GCSE Combined Science](#) > Core Practical Support

Category: Core Practical Support

[1-Combined-Science-Skills-mapping-for-Core-Practicals](#)



[Core_practical_ipdf_for_combined_sci_students](#)



[Core-practical-ipdf_combined_sci_teacher_ver](#)



[FAQs practical science statement](#)



[GCSE-9-1-Biology-Chemistry-Physics-Combined-Science-Practical-Science-Declaration](#)




Core practical teacher and student iPDF guides

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Key

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Fieldwork techniques	    	63

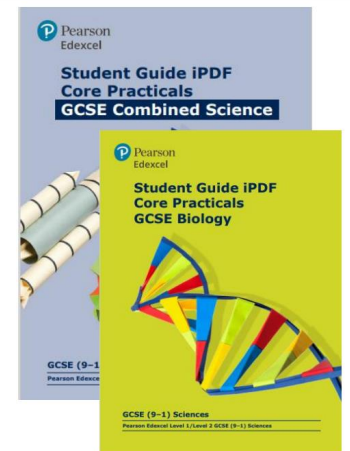
Investigate the effect of pH on enzyme activity



[pH and enzyme activity student sheet \(PDF | 153.07 KB\)](#)

[pH and enzyme activity teacher sheet \(PDF | 82.41 KB\)](#)

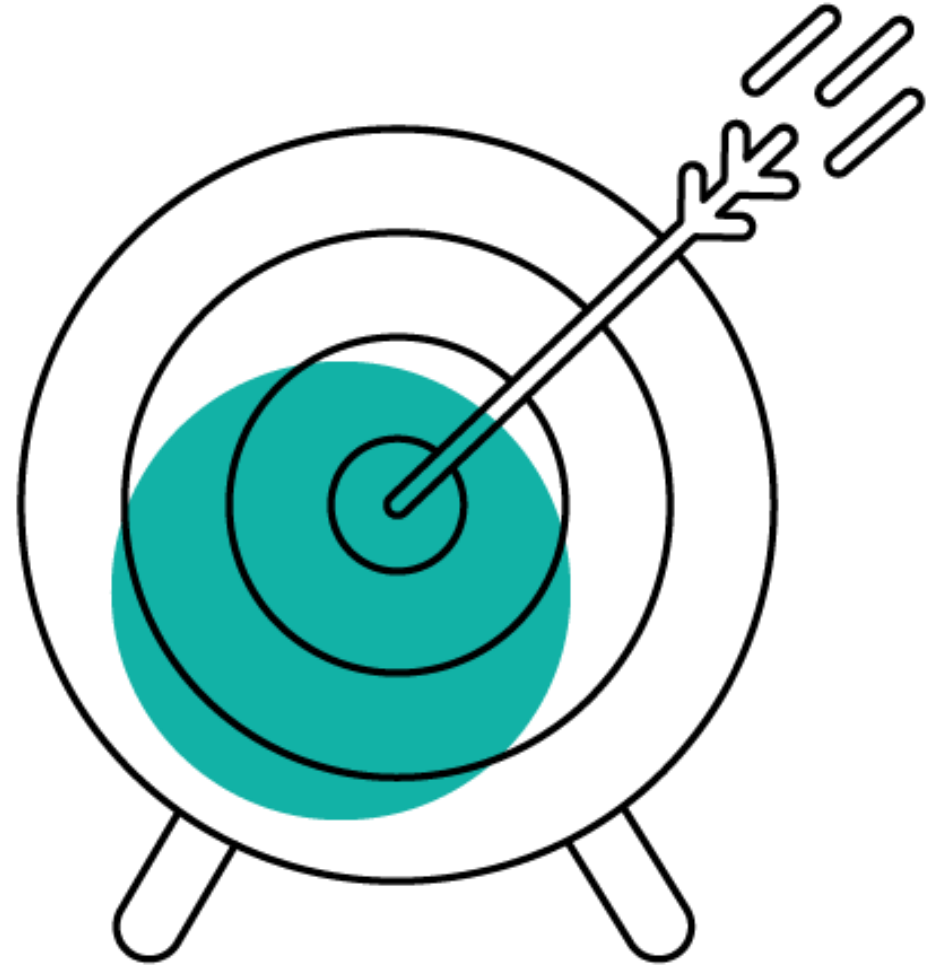
[Watch the longer version of this video here](#)



Summary

Thank you for attending this event where we looked at:

- upcoming resources
- Supporting Learners with EAL & Literacy Difficulties
- Support we offer
- Our autumn term events.





Pearson