GEMS FirstPoint School

Science

Parent Coffee Morning

11th October

Aims

CURRICULUM

ASSESSMENT

SUPPORT

GEMS FirstPoint School

CURRICULUM

Curriculum – KS3

Year	Biology	Chemistry	Physics
7	Cells and Organisation	States of Matter and Separating Mixtures	Energy
	Reproduction	Atoms and the Periodic Table	Forces
	Health and the Human Body	Chemical Reactions	Gravity
8	Photosynthesis and Respiration	Fuels and Atmosphere	Movement
	Inheritance and Evolution	Acids, Alkalis and their Reactions	Light
	Ecosystems and Interdependence	Materials and Recycling	Electricity and Magnetism

Curriculum – KS3

Key Ideas

Year	Biology	Chemistry	Physics
7	Cells and Organisation	States of Matter and Separating Mixtures	Energy
	Reproduction	Atoms and the Periodic Table	Forces
	Health and the Human Body	Chemical Reactions	Gravity
8	Photosynthesis and Respiration	Fuels and Atmosphere	Movement
	Inheritance and Evolution	Acids, Alkalis and their Reactions	Light
	Ecosystems and Interdependence	Materials and Recycling	Electricity and Magnetism

- Forces
- Electromagnets
- Energy
- Waves
- Matter
- Reactions
- Earth
- Organisms
- Ecosystems
- Genes

Curriculum – KS3

Enquiry processes: working scientifically

Analyse
- Analyse patterns
- Discuss limitations
- Draw conclusions
- Present data

Communicate
- Communicate ideas
- Construct explanations
- Critique claims
- Justify opinions

Enquire
- Collect data
- Devise questions
- Plan variables
- Test hypotheses

Solve
- Estimate risks
- Examine consequences
- Review theories
- Interrogate sources

Curriculum – KS4

Double Award

GCSE
COMBINED
SCIENCE:
TRILOGY

Separate Sciences
(Triple)

GCSE
BIOLOGY
GCSE
CHEMISTRY
GCSE
PHYSICS

AQA
Realising potential

Curriculum – KS4

Double Award

GCSE COMBINED SCIENCE: TRILOGY

BIOLOGY

CHEMISTRY

PHYSICS

- Covers all three Sciences
- Rigorous
- Well equipped for A-Level

AQA Realising potential

Curriculum – KS4

TRILOGY

- 6 examination papers *(2 for each science)*
- 1 hours and 15 minutes each
- 70 marks per paper – *420 in total*
- 16 required practicals
- 2 paired GCSE grades: *9-9, 9-8, 8-8 etc.*

SEPARATE SCIENCES

- 6 examination papers *(2 for each science)*
- Same content as combined Trilogy + separates only content
- 1 hour and 45 minutes each
- 100 marks per paper – 200 in total
- 8 required practicals per GCSE
- 3 separate GCSE grades

AQA Realising potential

GEMS EDUCATION We see genius in every child

GEMS FOR LIFE Always by your side

Curriculum – KS4

Combined Trilogy

2 Paired Grades

8-8
8-7
7-7

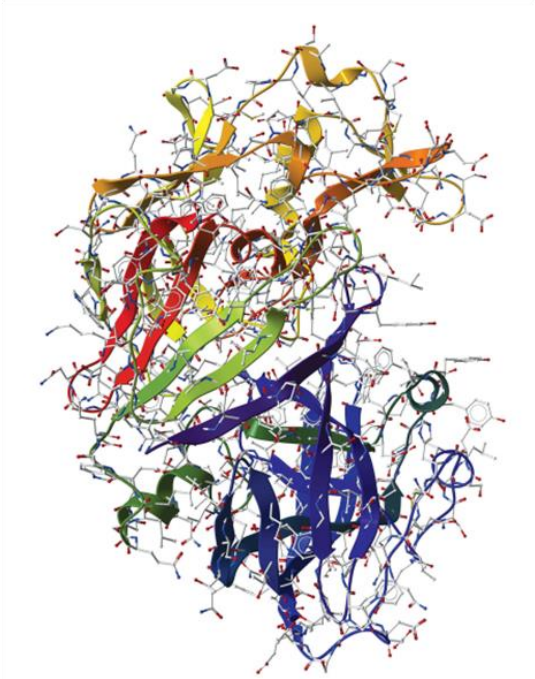
New grading structure	Former grading structure
9	A*
8	
7	A
6	B
5	
4	C
3	D
2	E
1	F
	G
U	U

Separate Sciences

3 Single Grades

Biology – 7
Chemistry – 7
Physics - 8

AS AND A-LEVEL BIOLOGY

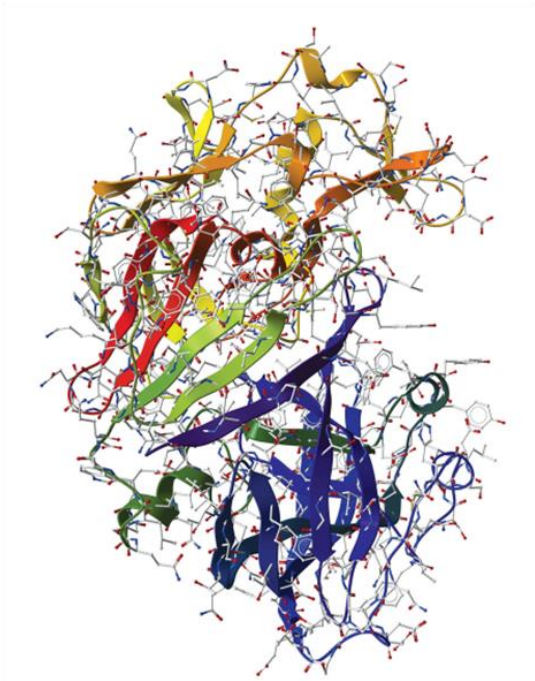


YEAR 12 - AS

Paper 1
What's assessed • Any content from topics 1–4, including relevant practical skills
Assessed • written exam: 1 hour 30 minutes • 75 marks • 50% of AS
Questions • 65 marks: short answer questions • 10 marks: comprehension question

Paper 2
What's assessed • Any content from topics 1–4, including relevant practical skills
Assessed • written exam: 1 hour 30 minutes • 75 marks • 50% of AS
Questions • 65 marks: short answer questions • 10 marks: extended response questions

AS AND A-LEVEL BIOLOGY



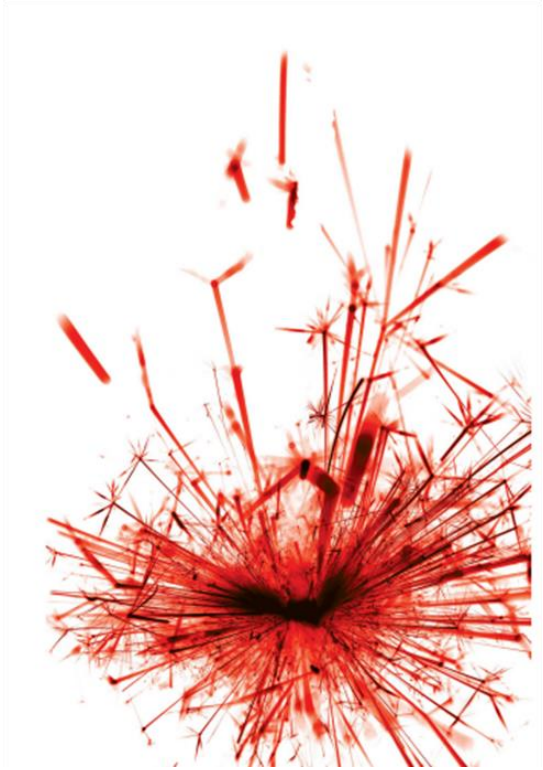
YEAR 13

Paper 1
What's assessed • Any content from topics 1–4, including relevant practical skills
Assessed • written exam: 2 hours • 91 marks • 35% of A-level
Questions • 76 marks: a mixture of short and long answer questions • 15 marks: extended response questions

Paper 2
What's assessed • Any content from topics 5–8, including relevant practical skills
Assessed • written exam: 2 hours • 91 marks • 35% of A-level
Questions • 76 marks: a mixture of short and long answer questions • 15 marks: comprehension question

Paper 3
What's assessed • Any content from topics 1–8, including relevant practical skills
Assessed • written exam: 2 hours • 78 marks • 30% of A-level
Questions • 38 marks: structured questions, including practical techniques • 15 marks: critical analysis of given experimental data • 25 marks: one essay from a choice of two titles

AS AND A-LEVEL CHEMISTRY



YEAR 12 - AS

Paper 1
What's assessed • Relevant physical chemistry topics (sections 3.1.1 to 3.1.4, 3.1.6 and 3.1.7) • Inorganic chemistry (section 3.2.1 to 3.2.3) • Relevant practical skills
Assessed • written exam: 1 hour 30 minutes • 80 marks • 50% of the AS
Questions 65 marks of short and long answer questions 15 marks of multiple choice questions

Paper 2
What's assessed • Relevant physical chemistry topics (sections 3.1.2 to 3.1.6) • Organic chemistry (section 3.3.1 to 3.3.6) • Relevant practical skills
Assessed • written exam: 1 hour 30 minutes • 80 marks • 50% of the AS
Questions 65 marks of short and long answer questions 15 marks of multiple choice questions

AS AND A-LEVEL CHEMISTRY

YEAR 13

Paper 1
What's assessed • Relevant physical chemistry topics (sections 3.1.1 to 3.1.4, 3.1.6 to 3.1.8 and 3.1.10 to 3.1.12) • Inorganic chemistry (section 3.2) • Relevant practical skills
Assessed • written exam: 2 hours • 105 marks • 35% of A-level
Questions 105 marks of short and long answer questions

Paper 2
What's assessed • Relevant physical chemistry topics (sections 3.1.2 to 3.1.6 and 3.1.9) • Organic chemistry (section 3.3) • Relevant practical skills
Assessed • written exam: 2 hours • 105 marks • 35% of A-level
Questions 105 marks of short and long answer questions

Paper 3
What's assessed • Any content • Any practical skills
Assessed • written exam: 2 hours • 90 marks • 30% of A-level
Questions 40 marks of questions on practical techniques and data analysis 20 marks of questions testing across the specification 30 marks of multiple choice questions

GEMS FirstPoint School

AS AND A-LEVEL PHYSICS

AQA Realising potential

YEAR 12 - AS

Paper 1
What's assessed Sections 1 - 5
Assessed • written exam: 1 hour 30 minutes • 70 marks • 50% of AS
Questions 70 marks of short and long answer questions split by topic.

Paper 2
What's assessed Sections 1 - 5
Assessed • written exam: 1 hour 30 minutes • 70 marks • 50% of AS
Questions Section A: 20 marks of short and long answer questions on practical skills and data analysis Section B: 20 marks of short and long answer questions from across all areas of AS content Section C: 30 multiple choice questions

AS AND A-LEVEL PHYSICS

YEAR 13

Paper 1
What's assessed Sections 1 - 5 and 6.1 (Periodic motion)
Assessed • written exam: 2 hours • 85 marks • 34% of A-level
Questions 60 marks of short and long answer questions and 25 multiple choice questions on content.

Paper 2
What's assessed Sections 6.2 (Thermal Physics), 7 and 8 Assumed knowledge from sections 1 to 6.1
Assessed • written exam: 2 hours • 85 marks • 34% of A-level
Questions 60 marks of short and long answer questions and 25 multiple choice questions on content.

Paper 3
What's assessed Section A: Compulsory section: Practical skills and data analysis Section B: Students enter for **one** of sections 9, 10, 11, 12 or 13
Assessed • written exam: 2 hours • 80 marks • 32% of A-level
Questions 45 marks of short and long answer questions on practical experiments and data analysis. 35 marks of short and long answer questions on optional topic.

ASSESSMENT

Assessment KS3

End of Topic

MCQ - Breadth

1 What is the difference between a scalar quantity and a vector quantity?

A A scalar quantity has magnitude and an associated direction, whereas a vector quantity has magnitude only
B A vector quantity has magnitude and an associated direction, whereas a scalar quantity has magnitude only
C A vector quantity is always larger than a scalar quantity
D Both have an associated direction but only vector quantities have magnitude

(1)

2 Which of the following is a scalar quantity?

A Acceleration
B Force
C Speed
D Velocity

(1)

3 What is the equation that links distance, force and work done?

A work done = force × distance
B work done = $\frac{\text{force}}{\text{distance}}$
C force = work done × distance
D force = $\frac{\text{distance}}{\text{work done}}$

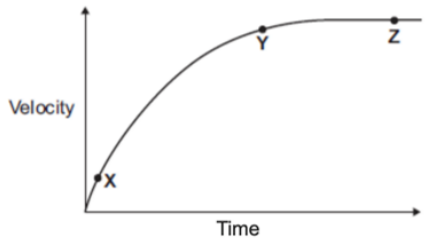
(1)

Exam Style - Depth

Section B

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

The **figure** below shows how the velocity of the cyclist changes during the first part of a journey along a straight and level road. During this part of the journey the force applied by the cyclist to the bicycle pedals is constant.

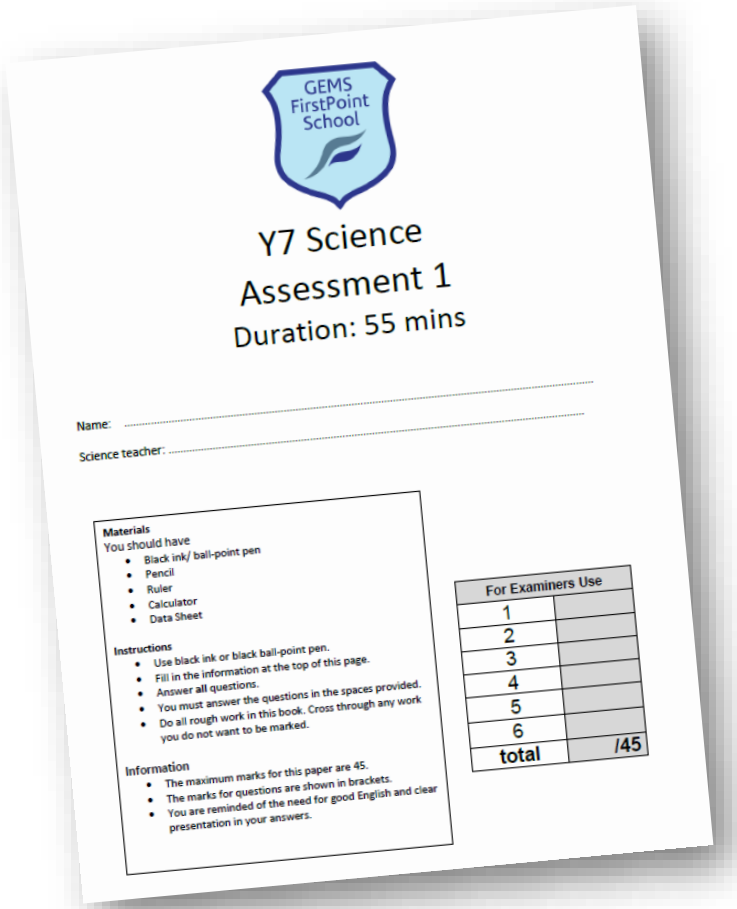


Describe how and explain, in terms of the forces A and B, why the velocity of the cyclist changes:

- between the points X and Y
- and between the points Y and Z, marked on the graph in Figure 2.

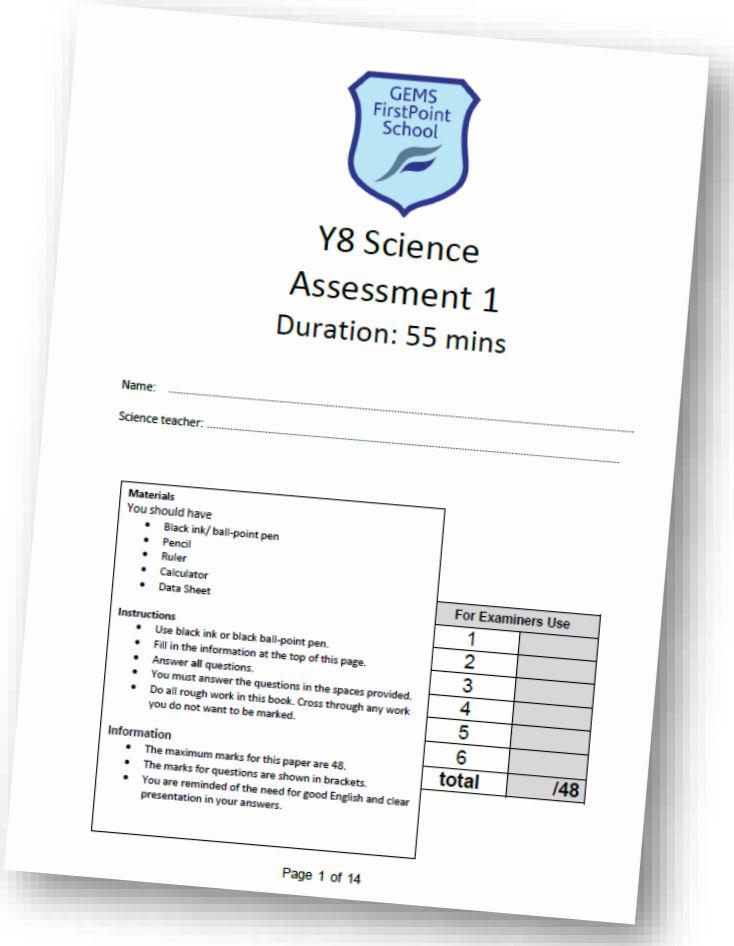
Assessment KS3

Assessment Week



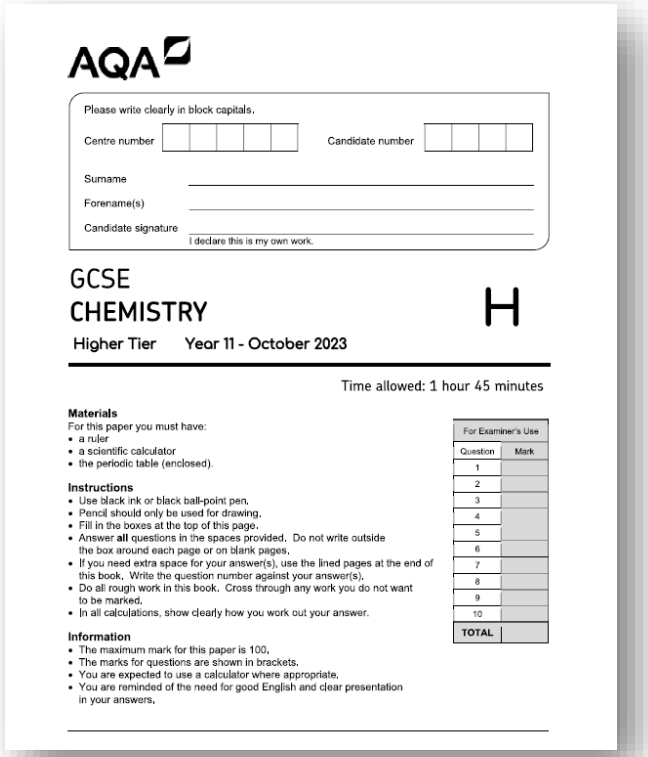
Full Exam Paper

- Key Knowledge
- Science Skills
- Maths Skills



Assessment KS4

- *End of Topic*
- *Assessment Week*



AQA

Please write clearly in block capitals.

Centre number | Candidate number

Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE
CHEMISTRY
H

Higher Tier Year 11 - October 2023

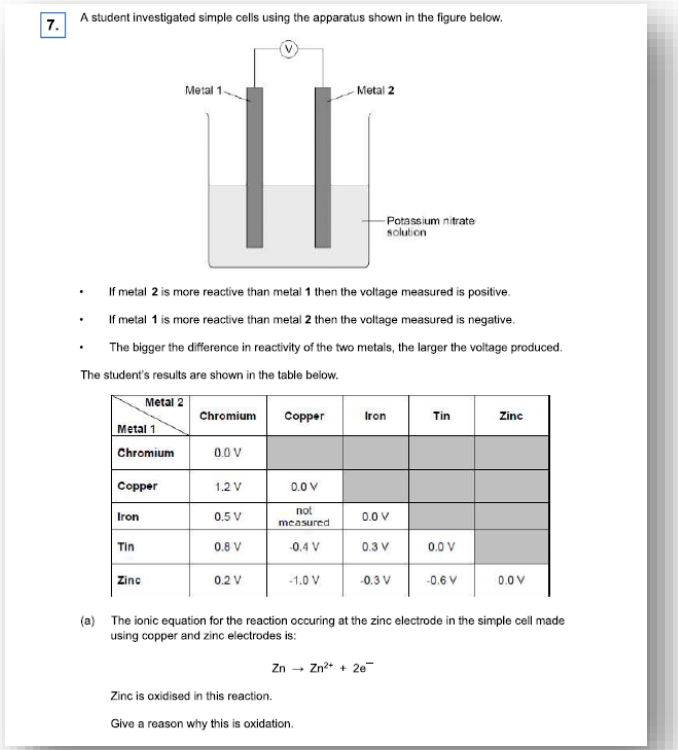
Time allowed: 1 hour 45 minutes

Materials
For this paper you must have:
- a ruler
- a scientific calculator
- the periodic table (enclosed).

Instructions
- Use black ink or black ball-point pen.
- Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

Information
- The maximum mark for this paper is 100.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	



7. A student investigated simple cells using the apparatus shown in the figure below.

- If metal **2** is more reactive than metal **1** then the voltage measured is positive.
- If metal **1** is more reactive than metal **2** then the voltage measured is negative.
- The bigger the difference in reactivity of the two metals, the larger the voltage produced.

The student's results are shown in the table below.

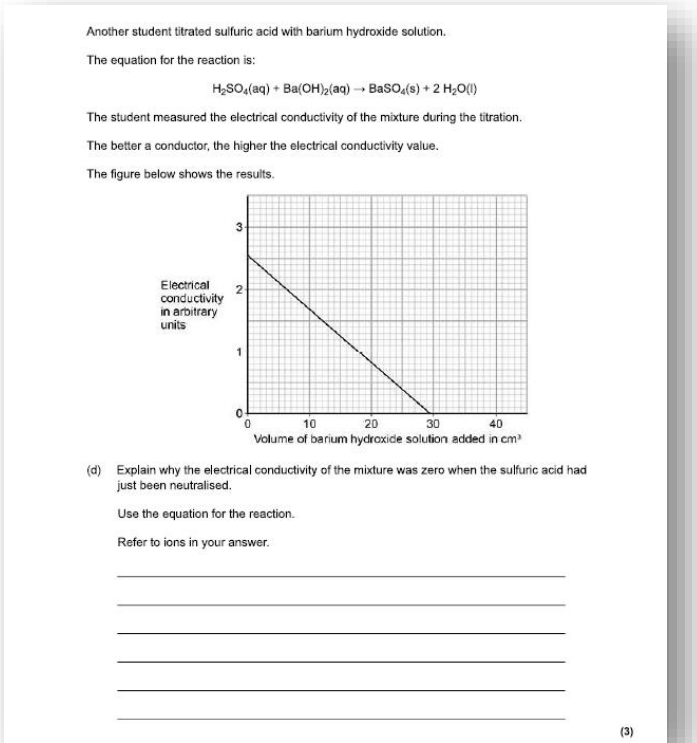
Metal 1 \ Metal 2	Chromium	Copper	Iron	Tin	Zinc
Chromium	0.0 V				
Copper	1.2 V	0.0 V			
Iron	0.5 V	not measured	0.0 V		
Tin	0.8 V	-0.4 V	0.3 V	0.0 V	
Zinc	0.2 V	-1.0 V	-0.3 V	-0.6 V	0.0 V

(a) The ionic equation for the reaction occuring at the zinc electrode in the simple cell made using copper and zinc electrodes is:

$$Zn \rightarrow Zn^{2+} + 2e^{-}$$

Zinc is oxidised in this reaction.

Give a reason why this is oxidation.



Another student titrated sulfuric acid with barium hydroxide solution.

The equation for the reaction is:

$$H_2SO_4(aq) + Ba(OH)_2(aq) \rightarrow BaSO_4(s) + 2\,H_2O(l)$$

The student measured the electrical conductivity of the mixture during the titration.

The better a conductor, the higher the electrical conductivity value.

The figure below shows the results.

(d) Explain why the electrical conductivity of the mixture was zero when the sulfuric acid had just been neutralised.

Use the equation for the reaction.

Refer to ions in your answer.

(3)

Assessment Data

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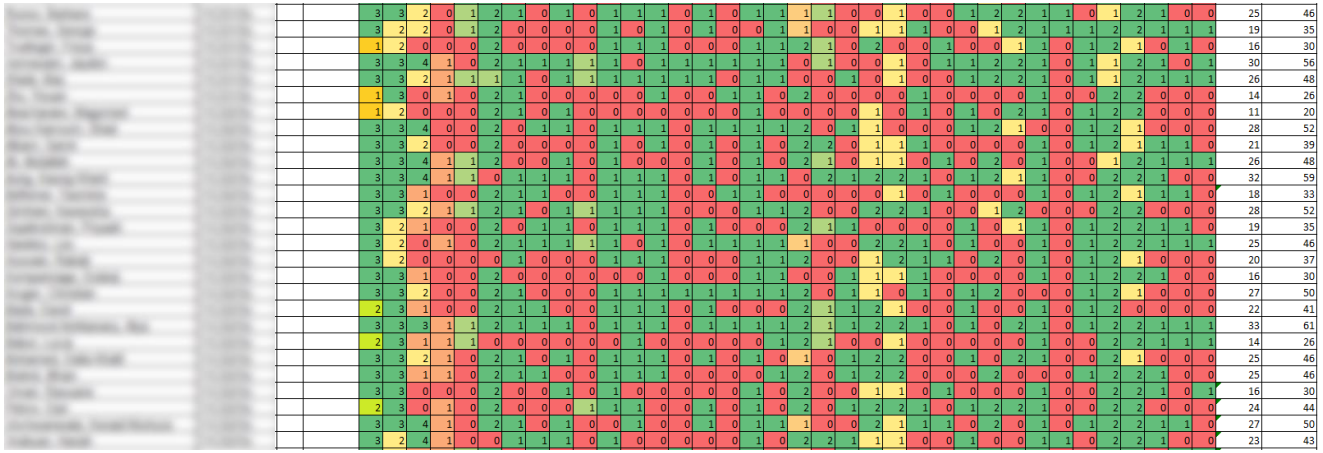
Assessment Data



Targeted Support

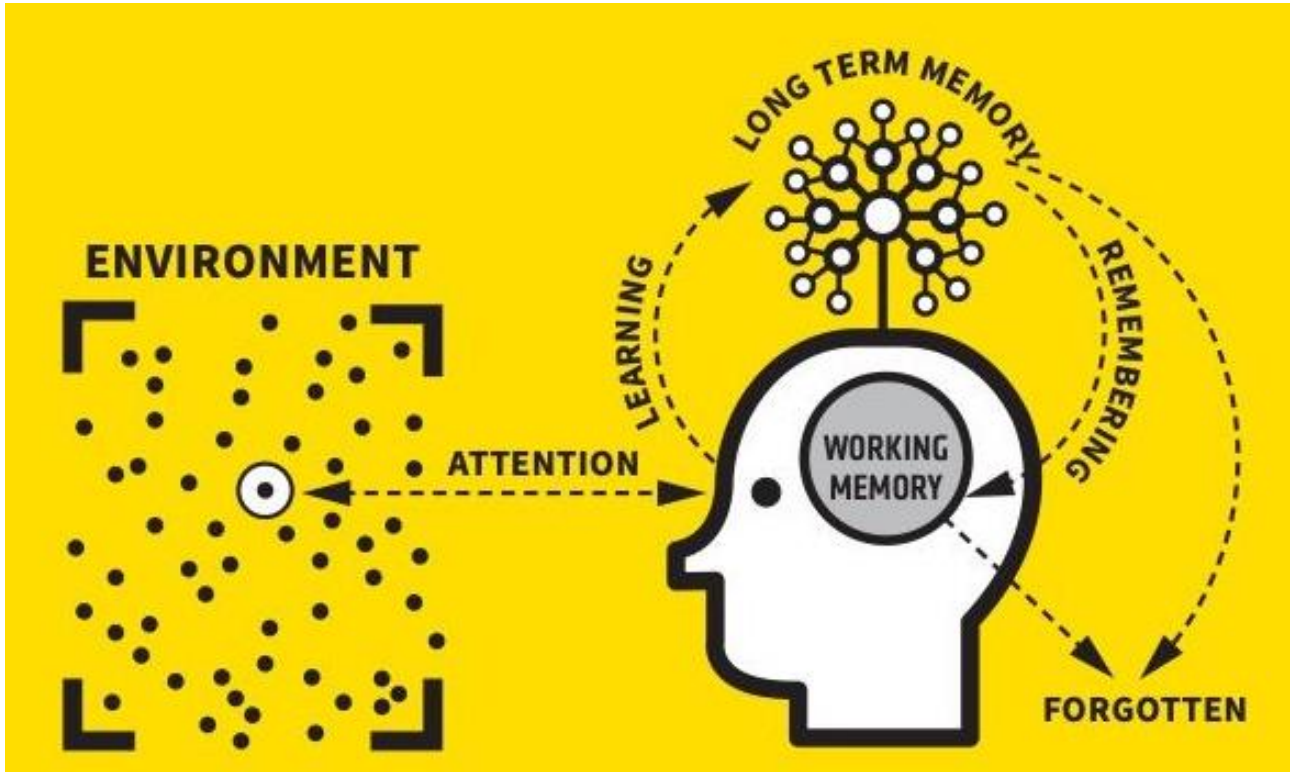
- In class
- Home Learning
- Independent Revision
- Curriculum

SUPPORT

Our Aim

We want our students to think and communicate like scientists

- Move information from their working memory into their long term memory using different learning strategies.
- Link new information to existing knowledge.
- Use regular retrieval practice to get the knowledge back to the working memory.
- Use a range of practice resources such as exam questions to consolidate learning and understanding.



The challenge at GCSE

Waves

Questions 1-21 are **basic** demand

Questions 22-28 are **intermediate** demand

Question 29 is **advanced** demand

1) **What are waves?**

   Waves transfer energy from one place to another without transferring any matter.

2) **What is the difference between a transverse wave and a longitudinal wave?**

   Transverse waves: oscillations are perpendicular to the direction of energy transfer.

   Longitudinal waves: oscillations are parallel to the direction of energy transfer.

The challenge at GCSE

Waves

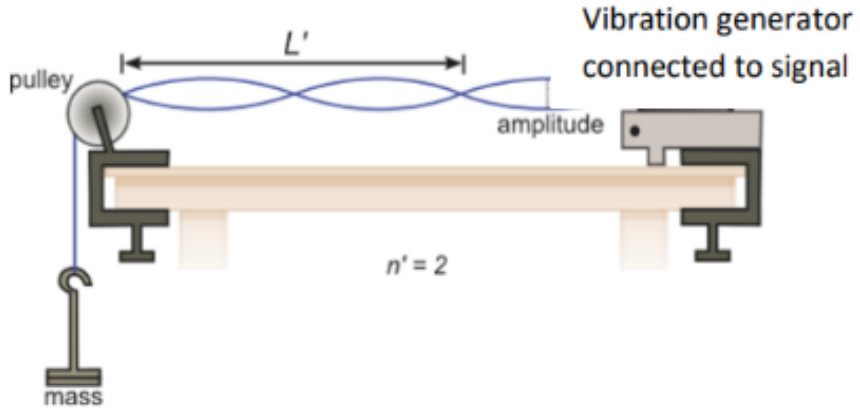
Questions 1-21 are **basic** demand

Questions 22-28 are **intermediate** demand

Question 29 is **advanced** demand

27) Describe a method to measure the frequency, wavelength and speed of waves in a solid (required practical).

1 – Set up the equipment as shown on the diagram with one end of the string attached to a signal generator and the other end attached to a hanging mass.



2 – The vibration generator is attached to a signal generator which allows the frequency of vibration of the string to be adjusted. The frequency of the wave *f* is whatever the signal generator is set to.

3 – Adjust the frequency of the signal generator until one full wave is formed. Use a ruler to measure the length of the wave. This is the wavelength λ.

4 – Use $v=f\lambda$ to find the speed of the waves.

The challenge at GCSE

Energy

Questions 1-6 are **basic** demand

Questions 7-14 are **intermediate** demand

Questions 15-24 are **advanced** demand

Electricity

Questions 1-13 are **basic** demand

Questions 14-22 are **intermediate** demand

Questions 23-25 are **advanced** demand

Particle Model

Questions 1-11 are basic demand

Questions 12-17 are intermediate demand

Questions 18-23 are advanced demand

Atomic Structure

Questions 1-22 are basic demand

Questions 23-34 are intermediate demand

Questions 35-37 are advanced demand

Forces

Questions 1-28 are **basic** demand

Questions 29-37 are **intermediate** demand

Questions 38-43 are **advanced** demand

Magnetism and Electromagnetism

Questions 1-13 are **basic** demand

Questions 14-22 are **intermediate** demand

Questions 23-25 are **advanced** demand

Waves

Questions 1-21 are **basic** demand

Questions 22-28 are **intermediate** demand

Question 29 is **advanced** demand

Energy

Questions 1-6 are **basic** demand

Questions 7-14 are **intermediate** demand

Questions 15-24 are **advanced** demand

Electricity

Questions 1-13 are **basic** demand

Questions 14-22 are **intermediate** demand

Questions 23-25 are **advanced** demand

Particle Model

Questions 1-11 are basic demand

Questions 12-17 are intermediate demand

Questions 18-23 are advanced demand

Atomic Structure

Questions 1-22 are basic demand

Questions 23-34 are intermediate demand

Questions 35-37 are advanced demand

Physics Total:

206

Biology Total:

361

Chemistry Total:

251

Combined Science Total:

Over 800!!!

Forces

Questions 1-28 are **basic** demand

Questions 29-37 are **intermediate** demand

Questions 38-43 are **advanced** demand

Waves

Questions 1-21 are **basic** demand

Questions 22-28 are **intermediate** demand

Question 29 is **advanced** demand

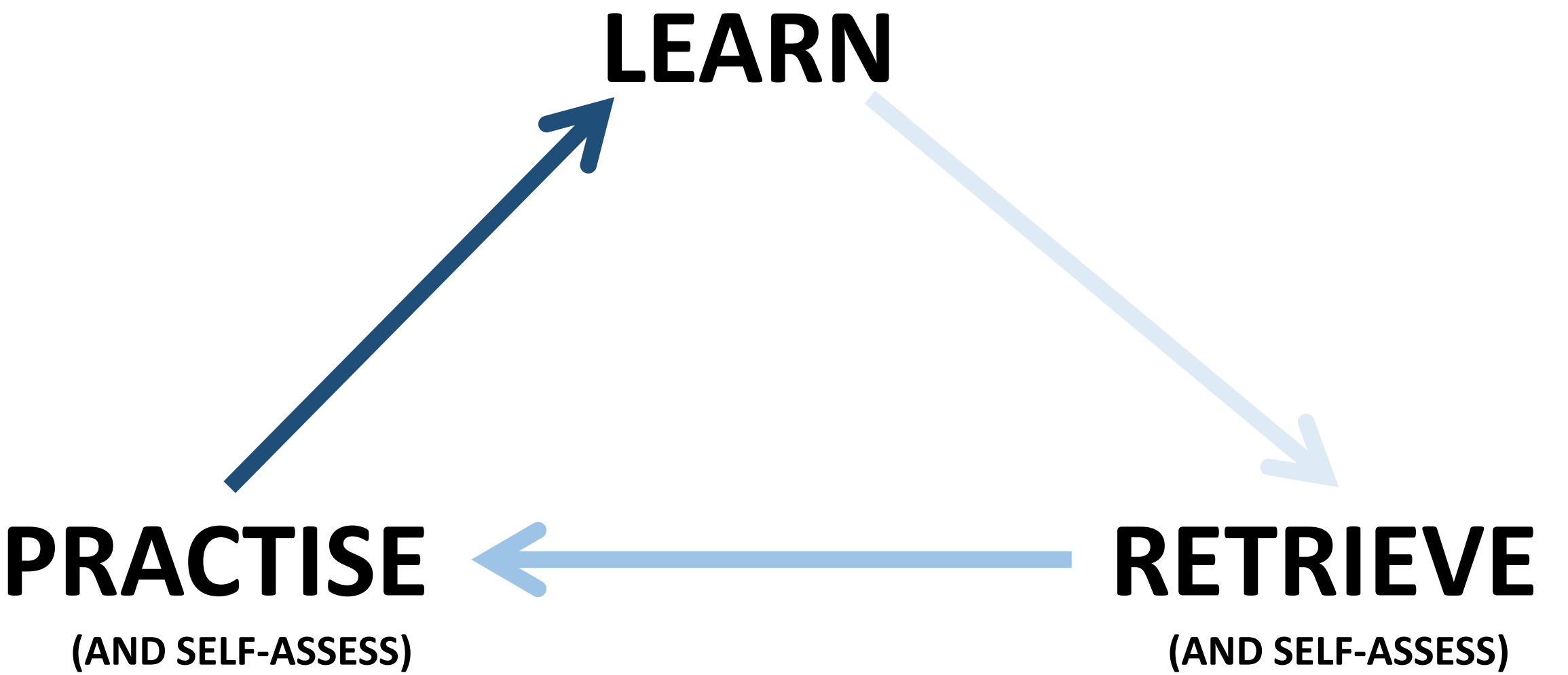
Magnetism and Electromagnetism

Questions 1-13 are **basic** demand

Questions 14-22 are **intermediate** demand

Questions 23-25 are **advanced** demand

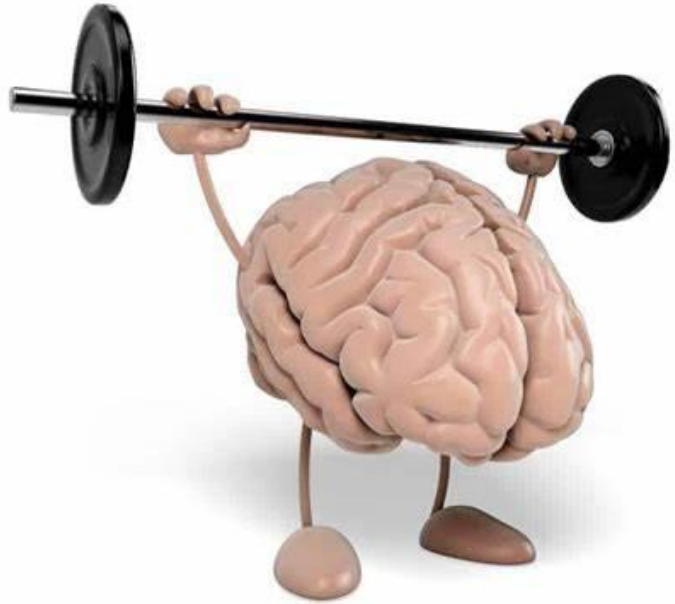
Our Solution



Our Solution

Two Principles:

1. Retrieval Practice
2. Mastery



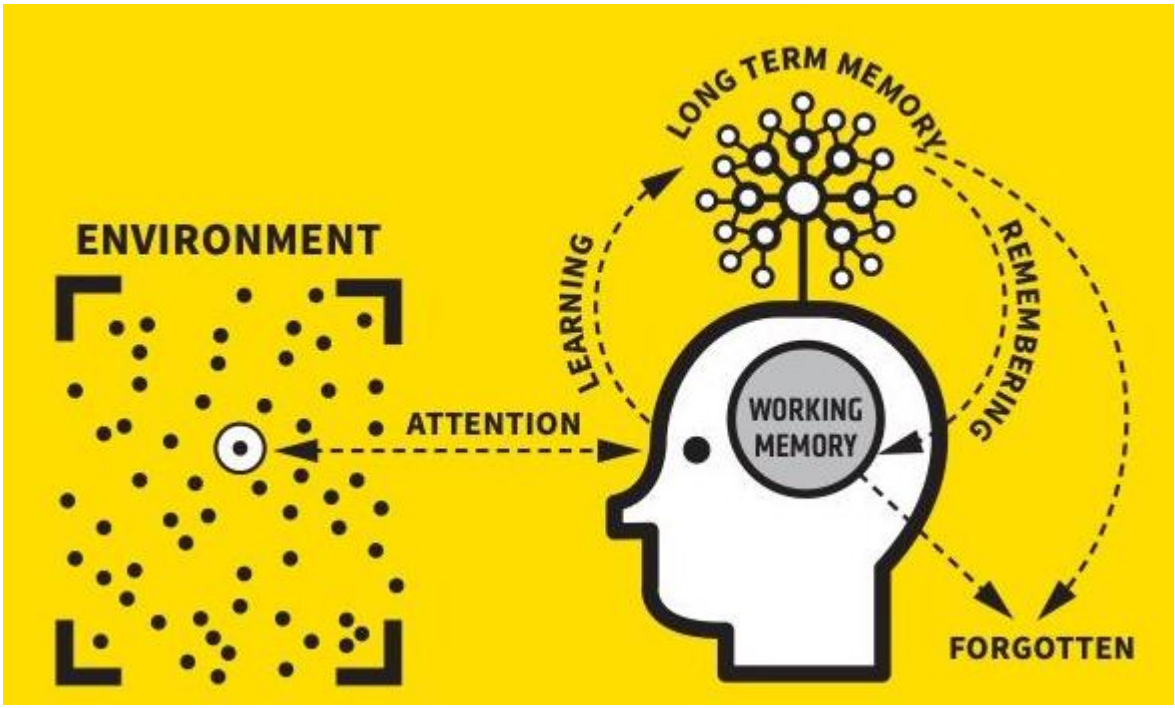
Our Solution

Retrieval Practice – in school and at home

<u>Retrieval Practice – learnt information is recalled from memory</u>

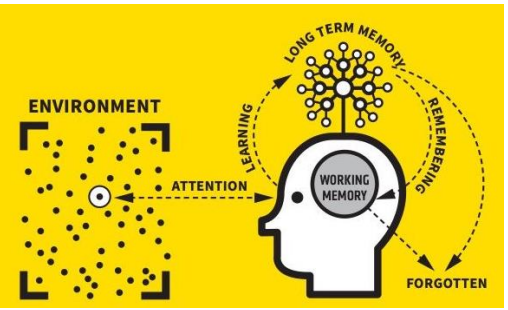
We want students to:

- Use regular retrieval practice and spaced learning to get the knowledge back to the working memory.
- This boosts learning and strengthens the memory.



Our Solution

Retrieval Practice – in school and at home



RETRIEVAL PRACTICE

Retrieve

1. What do waves do?
2. What is a transverse wave?
3. What is a longitudinal wave?
4. Give two similarities between all the waves in the electromagnetic spectrum.
5. Give one difference between the waves in the electromagnetic spectrum.
6. What is the unit for frequency?
7. What is the equation relating frequency, wavelength and wave speed.

RETRIEVAL PRACTICE:
Self-Assess with Purple Pen

Retrieve

1. What do waves do?
   A wave transfers energy without transferring matter
2. What is a transverse wave?
   Oscillations are perpendicular to the direction of energy transfer
3. What is a longitudinal wave?
   Oscillations are parallel to the direction of energy transfer
4. Give two similarities between all the waves in the electromagnetic spectrum.
   All transverse, all travel at the same speed (speed of light) in a vacuum
5. Give one difference between the waves in the electromagnetic spectrum.
   Different frequency, wavelength and energy
6. What is the unit for frequency?
   Hertz, Hz
7. What is the equation relating frequency, wavelength and wave speed.
   $v = f \times \lambda$

Our Solution

Mastery – in school and at home

We want students to:

- Use a range of practice resources such as exam questions to consolidate learning and understanding.

Our Solution

Mastery – in school and at home

1) What are waves?
Waves transfer energy from one place to another without transferring any matter.

2) What is the difference between a transverse wave and a longitudinal wave?
Transverse waves: oscillations are perpendicular to the direction of energy transfer.
Longitudinal waves: oscillations are parallel to the direction of energy transfer.

3) Give examples of both transverse and longitudinal wave.
Transverse waves: water ripples, ALL electromagnetic waves, S-seismic waves
Longitudinal waves: sound waves, P-seismic waves

4) What is the wavelength of a wave? What is the unit for wavelength?
The distance from a point on the wave to the same point on the next wave

5) What is the frequency of a wave? What is the unit for frequency?
The number of waves passing a point each second. Hertz, Hz

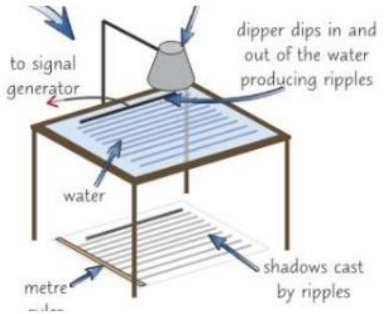
6) What is the amplitude of a wave?
The maximum disturbance of a point on the wave from the undisturbed position

7) What are the compression and rarefaction parts of a longitudinal wave?
Compression: areas where the particles are closer together
Rarefaction: areas where the particles are further apart

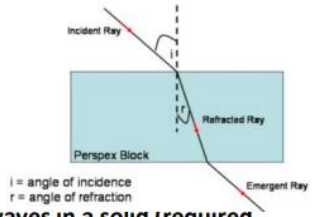
8) What is the speed of a wave?
The speed at which the energy is transferred through a medium, or the speed that the wave moves

25) Describe a method to measure the frequency, wavelength and speed of waves in a ripple tank (required practical).

1 – A signal generator is attached to the dipper of a ripple tank to create water waves at a set frequency.
2 – A lamp is used to shine light on the water to produce an image of the waves on a screen. The distance between each shadow is equal to one wavelength.
3 – A ruler is used to measure 10 wavelengths. Divide this by 10 to find the average wavelength.
4 – Use v = f x λ to find the speed of the waves.

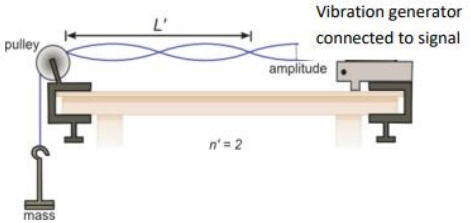


26) Describe how light refracts through a transparent block.
Incident ray hits refracts towards the normal as it enters the block.
Angle of refraction is smaller than angle of incidence.
Emergent ray refracts away from the normal as it leaves the block.
Emergent ray is parallel to incident ray.



27) Describe a method to measure the frequency, wavelength and speed of waves in a solid (required practical).

1 – Set up the equipment as shown on the diagram with one end of the string attached to a signal generator and the other end attached to a hanging mass.
2 – The vibration generator is attached to a signal generator which allows the frequency of vibration of the string to be adjusted. The frequency of the wave *f* is whatever the signal generator is set to.
3 – Adjust the frequency of the signal generator until one full wave is formed. Use a ruler to measure the length of the wave. This is the wavelength λ.
4 – Use $v=f\lambda$ to find the speed of the waves.



Our Solution

Mastery – in school and at home

Basic

Q1. Write down the wave equation.

Q2. Write down the units and symbols for velocity, frequency and wavelength.

Q3. What is the wave speed if:

a) f = 5 Hz, λ = 1 m b) f = 6 Hz, λ = 0.25 m c) f = 10 Hz, λ = 0.2 m

d) f = 0.01 Hz, λ = 25 m e) f = 2000 Hz, λ = 4 m f) f = 0.05 Hz, λ = 80 m

Medium

Q4. What is the frequency if:

a) v = 5 m/s, λ = 1 m b) v = 330 m/s, λ = 0.01 m c) v = 1,500 m/s, λ = 0.5 m

d) v = 0.1 m/s, λ = 80 m e) v = 17 m/s, λ = 0.1 m f) v = 300,000,000 m/s, λ = 0.002 m

Q5. What is the wavelength if:

a) f = 25 Hz, v = 2 m/s b) f = 15 Hz, v = 0.1 m/s c) f = 1,800 Hz, v = 0.2 m/s

d) f = 22 Hz, v = 2 m/s e) f = 1,300 Hz, v = 20 m/s f) f = 6,500,000 Hz, v = 343 m/s

Hard (word questions with unit conversions)

Q6. A sound wave has a frequency of 3.43 kHz and a wavelength of 0.1 m. Calculate the speed of sound.

Q7. A teacher (strangely) decides to sing to the class and sings with a frequency of 6.86 kHz and a wavelength of 5.0 cm. Calculate the speed of the wave.

Q8. A wave has a speed of 550 m/s and a frequency of 11 kHz. Calculate the wavelength.

Q10. A wave has a speed of 250 m/s and a frequency of 15 kHz. Calculate the wavelength.

Q11. The speed of any EM wave is 300,000,000 m/s. Calculate the frequency of a radio wave with wavelength of 10 cm.

Q12 A microwave oven used microwaves of wavelength 12 cm. Calculate the frequency of the microwaves.

Basic

1. How many EM waves are there?
2. Are EM waves transverse or longitudinal?
3. What speed do EM waves travel at in a vacuum?
4. List the EM waves in order (from longest wavelength to shortest wavelength).
5. Write the order of the colours in visible light (from longest wavelength to shortest wavelength).
6. Which EM wave:
   a) Has the longest wavelength?
   b) Has the highest frequency?
   c) Has the least energy?

Medium

7. What wave(s) have more energy than ultraviolet?
8. What wave(s) have a longer wavelength than infrared?
9. Microwaves and visible light are two types of EM wave. Both can be used for communications. Give **two** properties that are common to both visible light and microwaves.

Hard

10. We use ultrasound to scan unborn babies, and not X-rays. Explain why we do not use X-rays to scan unborn babies.
11. Describe the differences between visible light waves and sound waves.
12. Mobile phones send signals using microwaves. Explain why most people believe that these microwaves are not harmful to health.

Home Learning Revision Booklets

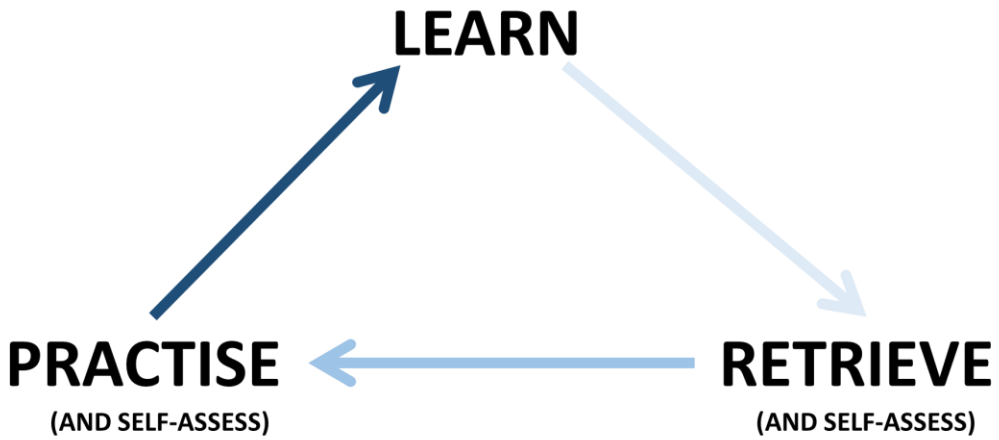
Year 11 Combined Science

Preparing for Mock Examinations

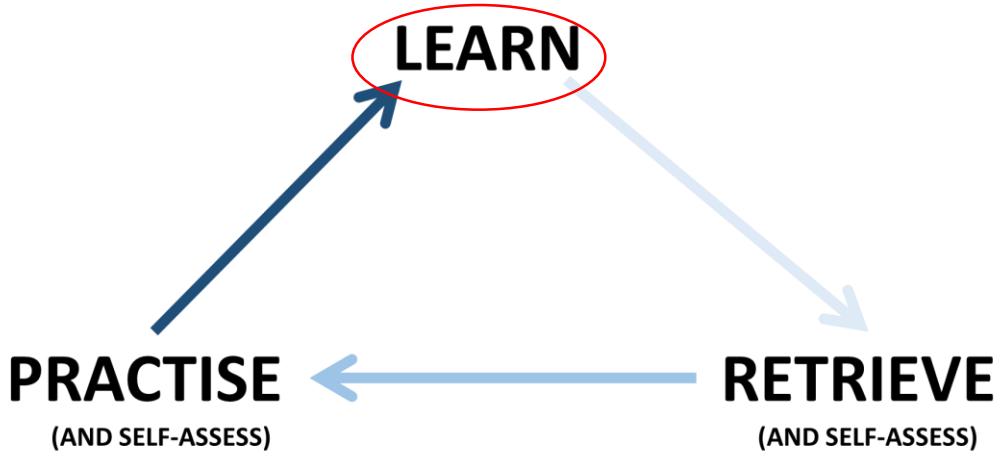
Week 4

You will have your mock examinations on the week beginning **Monday 23rd October.** It is important that you start to prepare now if you want to do well in the final examinations. You will sit three papers in the mock examinations:

Biology	B1 – Cell Biology B2 – Organisation B3 – Infection and Response B4 - Bioenergetics
Chemistry	C1 – Atomic Structure C2 – Bonding, Structure and Properties of Matter C7 – Organic Chemistry C8 – Chemical Analysis
Physics	P1 – Energy P3 - Particle Model P4 – Atomic Structure P6 – Waves



Home Learning Revision Booklets

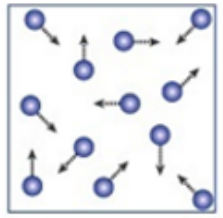


Learn

1) **What is density? What is the unit?**
   Mass per unit volume. kg/m^3

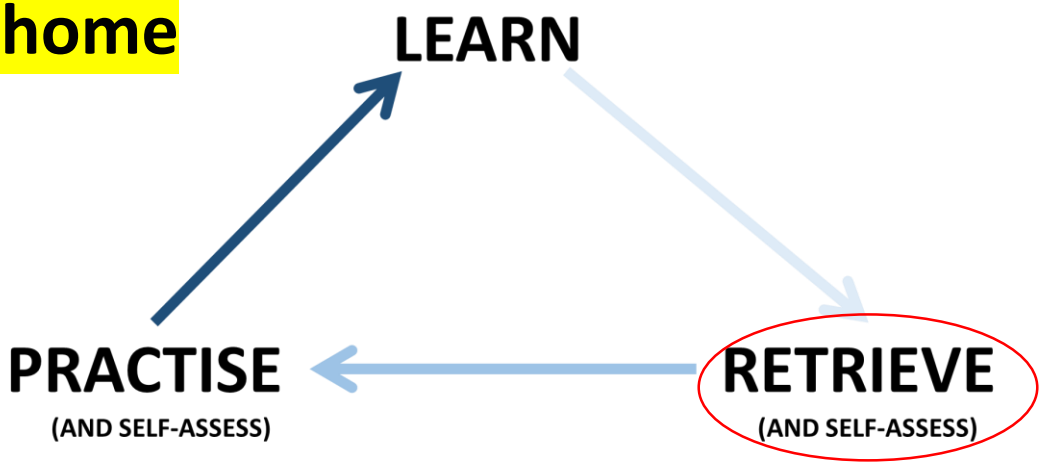
2) **What is the particle model? Describe some limitations of the particle model.**
   All matter is made of particles. The particle model can be used to explain the different states of matter. A limitation of the particle model is that the particles within the substance are not solid spheres and that the forces between the particles are not represented.

3) **What are the properties of a gas?**
   - Easy to compress
   - Can flow
   - Low density


Gas

4) **What is the arrangement and motion of particles in a gas?**
   - Very weak/negligible forces of attraction between particles
   - Free to move; travel in random directions at high speeds
   - Have high kinetic energy
   - Far apart; there is large space between them

Retrieval Practice – in school and at home



Retrieve

1) What is density? What is the unit?

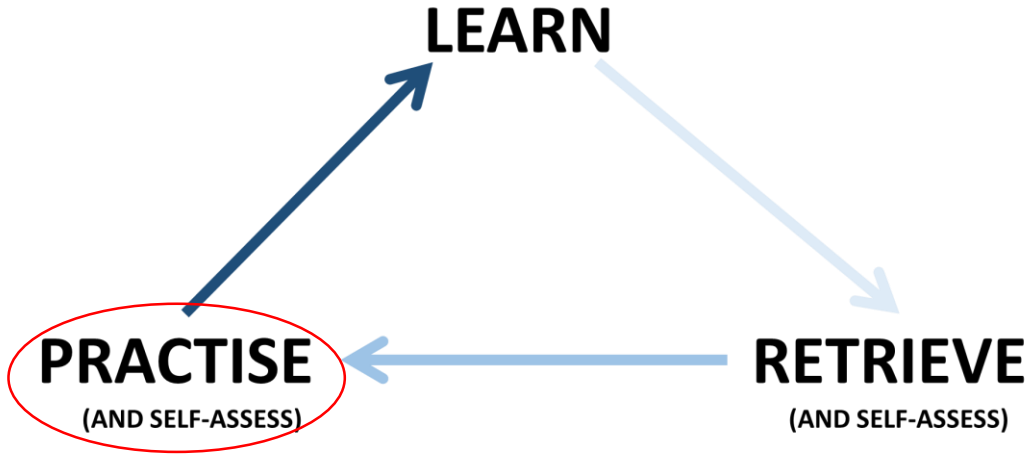
2) What is the particle model? Describe some limitations of the particle model.

3) What are the properties of a gas?

4) What is the arrangement and motion of particles in a gas?

5) What are the properties of a liquid?

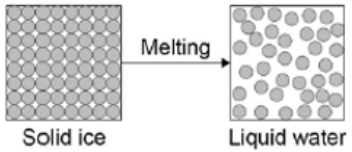
Mastery – in school and at home



Practise

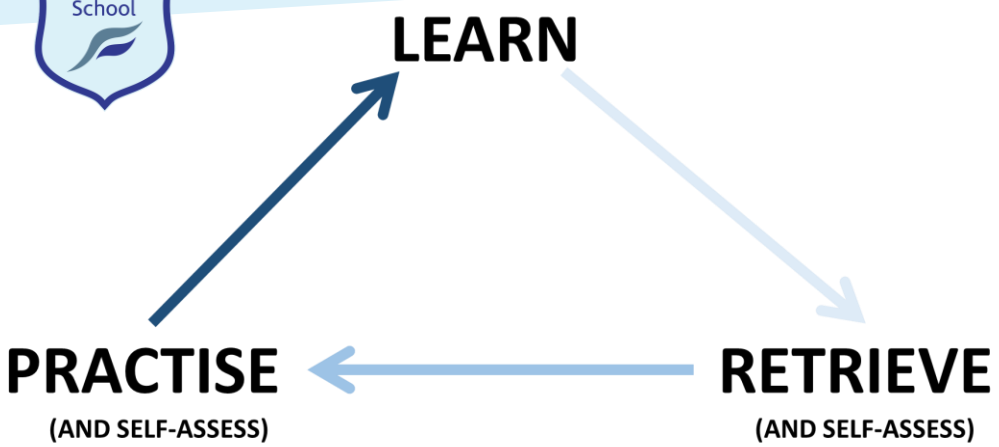
(a) Use the particle model in **Figure 2** to describe how the heating element causes the arrangement of the ice particles to change as the ice melts.

Figure 2



You should include a description of how the particles are arranged in the solid ice and in the water.

(6)



LEARN

PRACTISE

(AND SELF-ASSESS)

RETRIEVE

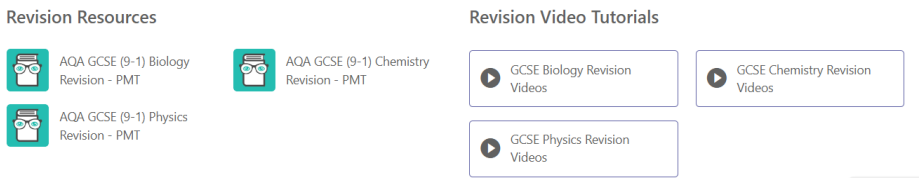
(AND SELF-ASSESS)

Support

Microsoft Teams

SENECA

GCSE
COMBINED
SCIENCE:
TRILOGY
(8464)



Science

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