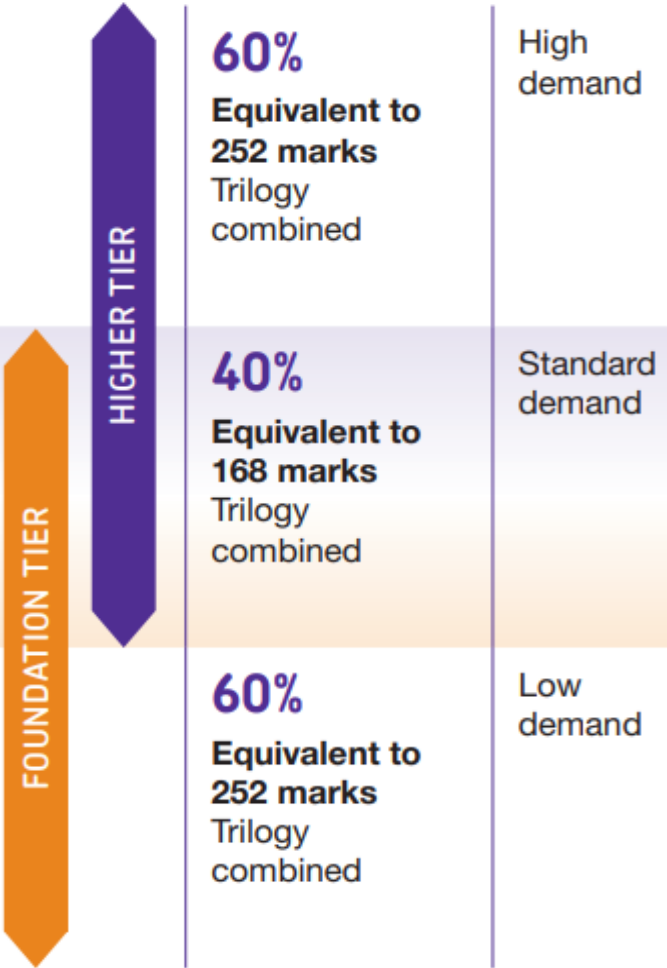


**SCIENCE**

GCSE  
grades  
Separate  
Science

H	F
9	
8	
7	
6	
5	5
4	4
3	3
	2
	1
U	U



GCSE  
grades  
Combined  
Science

H	F
99	
98	
88	
87	
77	
76	
66	
65	
55	55
54	54
44	44
43	43
	33
	32
	22
	21
	11
U	U

# COMBINED SCIENCE: TRILOGY

We are following the **AQA Combined Science: Trilogy** specification. Assessment consists of 6 papers altogether, two biology, two chemistry and two physics, each will assess different topics.

**Duration:** all the papers are 1 hour 15 minutes.

**Tiers:** Foundation and Higher.

**Weighting:** Each paper consists of 70 marks and is worth 16.7% of the grade.

**Question types:** multiple choice, structured, closed, short answer and open response. 15% of GCSE marks in exams come from questions relating to practicals.

Combined Science will have a 17 point grading scale, from 9–9, 9–8 through to 2–1, 1–1.

# SEPARATE SCIENCES

We are following the **AQA specifications**. Each science is assessed separately, leading to the award of three separate GCSEs. For **each** of the sciences assessment consists of 2 papers: each paper will assess knowledge and understanding from different topics.

**Duration:** both papers are 1 hour 45 minutes. **Tier:** Foundation and Higher.

**Weighting:** the papers are equally weighted. Each is worth 50% of the grade and has 100 marks available.

**Question types:** multiple choice, structured, closed short answer and open response. 15% of GCSE marks in exams come from questions relating to practicals.

The A\* to G grades will be replaced by 9 to 1 for Biology, Chemistry and Physics

# **EXAM DATES**

## **Combined Science and Triple Science**

Biology	Paper 1/1	B1-4	Tuesday 17 <sup>th</sup> May 2022
Chemistry	Paper 2/1	C1-5	Friday 27 <sup>th</sup> May 2022
Physics	Paper 3/1	P1-4	Thursday 9 <sup>th</sup> June 2022
Biology	Paper 4/2	B5-7	Wednesday 15 <sup>th</sup> June 2022
Chemistry	Paper 5/2	C6-10	Monday 20 <sup>th</sup> June 2022
Physics	Paper 6/2	P5-7 or 8	Thursday 23 <sup>rd</sup> June 2022

# REVISION GUIDES

Purchase a science specific revision guide  
(from school shop - if you haven't already  
done so)

Comes with  
free online  
access

## Functions of the Blood

Blood is very useful stuff. It's a big transport system for moving things around the body. The **blood cells** do good work too. The **red blood cells** are responsible for transporting **oxygen** about, and they carry 100 times more than could be moved just dissolved in the plasma. And as for the white blood cells...

### Plasma is the Liquid Bit of Blood

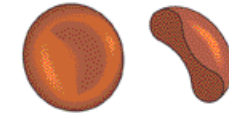
It's basically blood minus the blood cells (see below). Plasma is a pale yellow liquid which **carries just about everything** that needs transporting around your body:

- 1) **Red and white blood cells** (see below) and **platelets (used in clotting)**.
- 2) **Water**.
- 3) Digested food products like **glucose** and **amino acids** from the gut to all the body cells.
- 4) **Carbon dioxide** from the body cells to the lungs.
- 5) **Urea** from the liver to the kidneys (where it's removed in the urine).
- 6) **Hormones** — these acts like chemical messengers.
- 7) **Antibodies** and **antitoxins** produced by the white blood cells (see below).

### Red Blood Cells Have the Job of Carrying Oxygen

They transport **oxygen** from the **lungs** to **all** the cells in the body. The **structure** of a red blood cell is adapted to its **function**:

- 1) Red blood cells are **small** and have a **biconcave shape** (which is a posh way of saying they look a little bit like doughnuts, see diagram below) to give a **large surface area** for **absorbing** and **releasing oxygen**.
- 2) They contain **haemoglobin**, which is what gives blood its **colour** — it contains a lot of **iron**. In the lungs, haemoglobin **reacts with oxygen** to become **oxyhaemoglobin**. In body tissues the reverse reaction happens to **release oxygen to the cells**.
- 3) Red blood cells don't have a **nucleus** — this frees up **space** for more haemoglobin, so they can carry more oxygen.



### White Blood Cells are Used to Fight Disease

...against disease.

...to fight microbes.

...to neutralise the toxins produced by microbes.

...e, which helps them to **engulf** any micro-organisms they come across. Basically the white blood cell wraps around the micro-organism and, and then it **digests it** using enzymes.

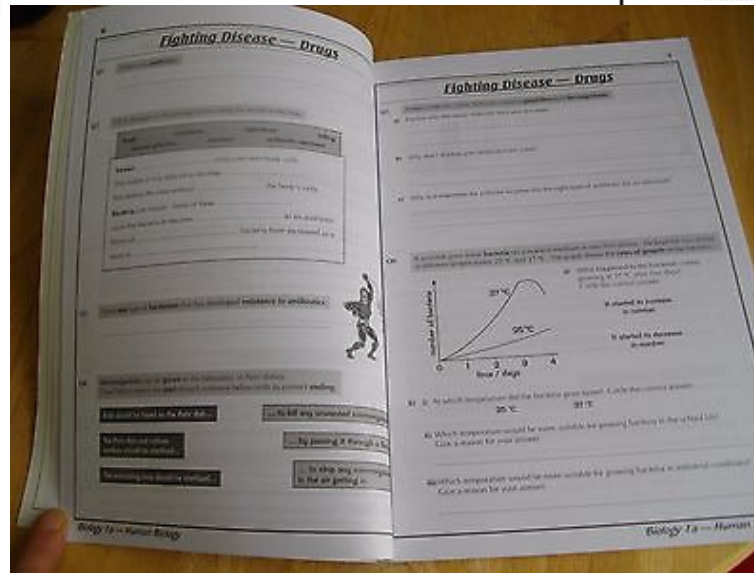


**Sweat and tears — kind of...** ...without the sweat... or the tears...  
...just the blood then... yep... anyway...  
...contains about **six and a half pints** of blood altogether, and every single drop of blood there are usually about 500 times more red blood cells than white.

...and Growing

# REVISION WORKBOOKS

Some students may benefit from using a dedicated science specific workbook (available with answer booklet from the school shop)



## Static Electricity

Q1 Circle the pairs of charges that would attract each other and underline those that would repel.

positive and positive    positive and negative    negative and positive    negative and negative

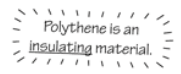
Q2 Fill in the gaps in these sentences with the words below.

electrons	positive	static	insulating	negative
..... electricity can build up when two ..... materials are rubbed together. The ..... move from one material onto the other. This leaves a ..... charge on one of the materials and a ..... charge on the other.				



Q3 The sentences below are wrong. Write out a **correct** version for each.

a) An insulating rod becomes negatively charged when rubbed with a duster because it loses electrons.



..... and polythene rod will repel small pieces of paper if they are placed near it.

..... er two charged objects are together, the less strongly they attract or repel.

..... ively charged object is connected to earth by a metal strap, ..... flow through the strap from the object to the ground.

..... of static can cause sparks if the distance between the object and the earth is big enough.

# Google drive – revision materials

The screenshot displays a Google Drive web interface within a browser window. The browser's address bar shows the URL <https://drive.google.com/drive/folders/17k8dWGnkhRbjs82Fo7qwyV0vSN7Unorp>. The page title is "BGLC Drive". The breadcrumb navigation path is "GCSE Science Revision > Combined Science (Trilogy) > Biology Paper 1 > B1 Cell Biology".

The left sidebar contains the following navigation options:

- My Drive
- Team Drives
- Shared with me
- Recent
- Google Photos
- Starred
- Bin
- 5 GB used

The main content area, titled "Files", displays a grid of documents:

- B1 Cell Biology R... (PDF)
- B1 Cell Biology R... (PDF)
- B1 Complete You... (Word document)
- B1 low demand p... (Document)
- B1 standard dem... (Document)
- B1,B2 & B3 Past ... (Word document)
- Biology-Revision-... (PowerPoint presentation)

The Windows taskbar at the bottom shows the system clock at 17:02 on 06/01/2018, along with various application icons and a search bar.

(b) When sodium chloride solution is electrolysed the products are hydrogen and chlorine.

(i) What is made from chlorine?

Tick (✓) **one** box.

Bleach

☐

Fertiliser

☐

Soap

☐

(ii) Sodium chloride solution contains two types of positive ions (Na<sup>+</sup>).

Why is hydrogen produced at the negative electrode?

Tick (✓) **one** box.

3. I can calculate total magnification. ☐

5. I can  
draw a diagram

Describe the structure of a  
Plum pudding model

Alpha particles are made of two protons and two neutrons

## What the formula means

- HCl
  - Each capital letter shows a new element
  - If there are no numbers this means there is one of each
  - 1 H and 1 Cl
- CaCO<sub>3</sub>
  - A little number only applies to the number it follows
  - 1 Ca, 1 C but 3 O's
- 2KI
  - A big number means that it applies to everything after it
  - So this has 2 K's and 2 I's
- Mg(OH)<sub>2</sub>
  - Numbers in the brackets times by the number outside the brackets
  - So this has 1 Mg, 2 O and 2 H

Neutron relative mass:

Electron relative charge

# TASSOMAI

Online learning and revision platform

Multiple choice quizzes

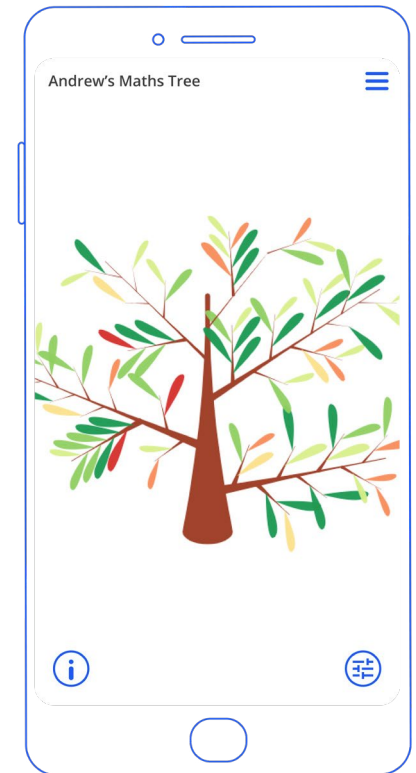
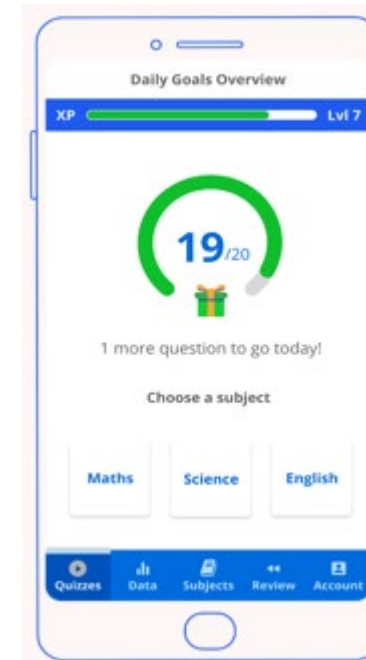
Daily goals: 3X per week Comb Sci  
4X for Sep Sci

Organises and spreads out learning

Personalises content

Builds knowledge


Generate a virtual tree to represent learning



<https://www.youtube.com/watch?v=WgdLrPUec1k>






← → ↻ Secure | https://ap

SENECA BETA

 **Biology: AQA GCSE Higher**

2 Organisation

- 2.1 Principles of Organism...
- 2.2 Enzymes
- 2.3 Circulatory System
  - 2.3.1 Blood Vessels
  - 2.3.2 Blood Vessels 2
  - 2.3.3 The Heart**
  - 2.3.4 Circulatory System & Gas Exchange
  - 2.3.5 Blood
  - 2.3.6 Blood Cells
- 2. Share Free Teacher CPD Cours


2.     

# YOUTUBE RECOMMENDED CHANNELS

## HELPFUL CHANNELS FOR REVISION TIPS OR SCIENCE TOPICS

Below are a list of recommended channels on YouTube that have videos that would be helpful in your Science revision:


### YouTubers recommended for Science topics and revision tips:


Revision with Eve  Revision With Eve  
94,778 subscribers

Primrose Kitten  Science and Maths by Primrose Kitten  
38,981 subscribers

Christopher Thornton  Christopher Thornton  
32,740 subscribers

### YouTubers recommended for Science topics:

My GCSE Science  myGCSEscience  
17,022 subscribers

Free Science Lessons  Free Science Lessons  
70,074 subscribers

### YouTubers recommended for Revision skills:

Study with Jess  Study With Jess  
39,828 subscribers

OR

UNI ADMISSIONS

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er recommended

# GCSE REQUIRED PRACTICALS

<https://www.youtube.com/c/MalmesburyEducation/playlists>

## GCSE Science Required Practicals



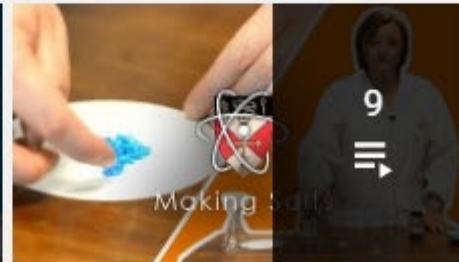
### GCSE Biology Required Practicals

Malmesbury Education  
[VIEW FULL PLAYLIST](#)



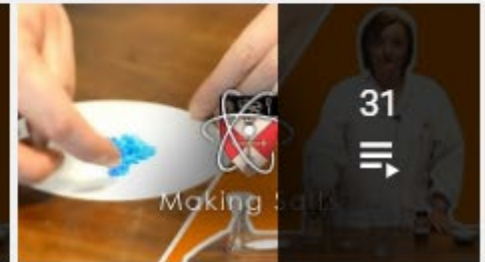
### GCSE Physics Required Practicals

Malmesbury Education  
[VIEW FULL PLAYLIST](#)



### GCSE Chemistry Practicals

Malmesbury Education  
[VIEW FULL PLAYLIST](#)



### GCSE Science Required Practicals

Malmesbury Education  
[VIEW FULL PLAYLIST](#)

# REVISION IN SCHOOL

Most classes will finish formal teaching of content by mid march

Preparation formal assessments

Revision in class:

Re-teaching of topics identified on advanced materials

Re-teaching of difficult topics

Focussed exam question prep

Independent study

- ## Revision Timetable

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
07:00							
08:00							
09:00							
10:00							
11:00							
12:00							
13:00							
14:00							
15:00							
16:00							
17:00							
18:00							
19:00							
20:00							
21:00							
22:00							
23:00							

[Specimen mark scheme \(208.0 KB\)](#)

[Specimen question paper \(521.5 KB\)](#)

[Specimen mark scheme \(174.6 KB\)](#)

[Specimen question paper \(457.1 KB\)](#)

[Specimen mark scheme \(176.6 KB\)](#)

[Specimen question paper \(344.8 KB\)](#)

[Specimen mark scheme \(161.2 KB\)](#)

[Specimen question paper \(517.3 KB\)](#)

[Specimen mark scheme \(139.8 KB\)](#)

[Specimen question paper \(272.3 KB\)](#)

[Specimen mark scheme \(150.8 KB\)](#)

[Specimen question paper \(418.4 KB\)](#)

The collage includes several pages of handwritten biology notes on lined paper, covering topics like osmosis, evaporation, transpiration, photosynthesis, fertilisers, pesticides, herbicides, detritivores, carbon dioxide, and biomass pyramids. It also features a printed page titled "B4 It's a green world" with various questions and answers related to plant processes. On the right side, there are two AQA GCSE Combined Science: Trilogy Higher Tier Paper 1: Biology 1H specimen papers from 2018.

# ADVANCED INFORMATION TO BE RELEASED ON 7<sup>TH</sup> FEB

## WHAT WE KNOW SO FAR

Advanced information will be provided for both foundation and higher

Physics equations will be provided

It will provide a list of topics from the specification that will form the focus of the assessment on each paper, **in specification order, not in question order**

Topics not included on the list for assessment may still appear in low tariff or 'linked content' questions

It will also list the titles of required practical activities assessed in the papers

# EXAM TIPS

For this year only the physics equations are provided for the physics exams

A periodic table is provided for the chemistry exams

© IUPAC 2013

The Periodic Table of the Elements

Key

relative atomic mass  
atomic symbol  
name  
atomic (proton) number

1  
H  
hydrogen  
1

7 Li lithium 3	9 Be beryllium 4																	11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12																	27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulphur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36						
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54						
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86						
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	Elements with atomic numbers 113-116 have been reported but not fully authenticated												

\* The lanthanoids (atomic numbers 58-71) and the actinoids (atomic numbers 90-103) have been omitted.

The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.



## Physics Equations Sheet GCSE Combined Science: Trilogy (8464) and GCSE Combined Science: Synergy (8465)

FOR USE IN JUNE 2022 ONLY

HT = Higher Tier only equations

kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$	$E_k = \frac{1}{2} m v^2$
elastic potential energy = $0.5 \times \text{spring constant} \times (\text{extension})^2$	$E_e = \frac{1}{2} k e^2$
gravitational potential energy = $\text{mass} \times \text{gravitational field strength} \times \text{height}$	$E_p = m g h$
change in thermal energy = $\text{mass} \times \text{specific heat capacity} \times \text{temperature change}$	$\Delta E = m c \Delta \theta$
power = $\frac{\text{energy transferred}}{\text{time}}$	$P = \frac{E}{t}$
power = $\frac{\text{work done}}{\text{time}}$	$P = \frac{W}{t}$
efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	
efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	
charge flow = $\text{current} \times \text{time}$	$Q = I t$
potential difference = $\text{current} \times \text{resistance}$	$V = I R$
power = $\text{potential difference} \times \text{current}$	$P = V I$
power = $(\text{current})^2 \times \text{resistance}$	$P = I^2 R$
energy transferred = $\text{power} \times \text{time}$	$E = P t$

Physics Equations Sheet –  
GCSE Combined Science: Trilogy (8464) and GCSE Combined Science: Synergy (8465)  
FOR USE IN JUNE 2022 ONLY

Turn over ►

# EXAM TIPS

Rough guide is 1 mark per minute!

Have a go, if in doubt put something it down (no answer = no mark)

9 Enzymes have many industrial uses.

(a) Draw straight lines to join each **enzyme** with the correct **use of the enzyme**.

Draw only **three** lines.

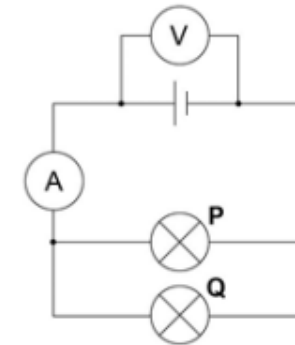
Enzyme	Use of the enzyme
<input type="text" value="sucrase"/>	<input type="text" value="used in the production of milk for people with intolerance to dairy products"/>
<input type="text" value="lactase"/>	<input type="text" value="used on reagent strips to detect lactose"/>
<input type="text" value="ligase"/>	<input type="text" value="used to join strands of DNA together"/>
	<input type="text" value="used to produce sweeter sugars for food"/>

0 1

**Figure 1** shows a circuit diagram containing two identical lamps arranged in parallel.

The reading on the ammeter is 186 mA.

**Figure 1**



0 1 . 1

Which statement about the current through the lamps is true?

[1 mark]

Tick **one** box.

The current through both lamp **P** and lamp **Q** is **0.093 A**

☐

The current through both lamp **P** and lamp **Q** is **0.186 A**

☐

The current through both lamp **P** and lamp **Q** is **0.93 A**

☐

The current through both lamp **P** and lamp **Q** is **1.86 A**

☐

# LONGER ANSWER QUESTIONS

Don't be daunted by the 4 - 6 mark questions.

Read the stem of the question, it often has vital information.

Read the command words carefully – describe, explain, compare, evaluate

If data- table/graph is given, use it!

It is OK to bullet point your answer.

Read through what you have written!!!

**Dare to have a go!**

3 Look at the picture of a firefly.

The firefly is able to give out flashes of bright light to attract a mate.

Just after dark is the best time to see fireflies flashing light.

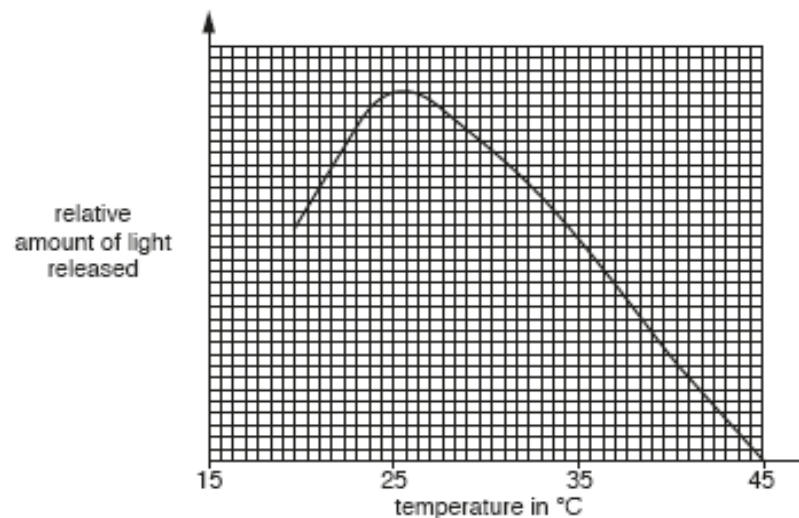


The reaction that releases the light involves the breakdown of a chemical.

An enzyme called luciferase is needed for this reaction.

Look at the graph.

It shows how temperature affects the reaction that releases light.



9

- (a) Use data from the graph to **explain** the effect of temperature on luciferase and explain why it is **only** luciferase enzyme that will catalyse this reaction.

## If data is given, use it!

[6]

[6]

**0 5 . 3** In coronary heart disease (CHD) layers of fatty material build up inside the coronary arteries. This can cause a heart attack.

Statins and stents can be used to reduce the risk of a heart attack in people with CHD.

Evaluate the use of statins and stents in people with CHD.

Remember to include a justified conclusion.

**[6 marks]**

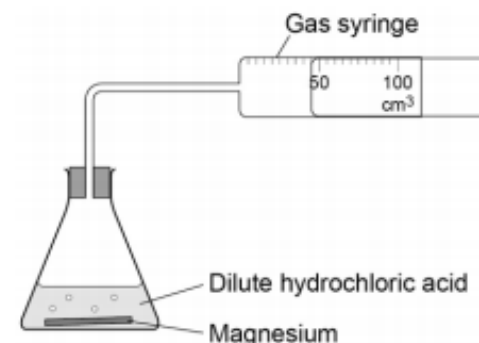
Evaluation – remember to  
give balanced arguments  
and a **conclusion**

**0 3**

A student investigated the rate of the reaction between magnesium and dilute hydrochloric acid.

The student used the apparatus shown in **Figure 4** to collect the gas produced.

**Figure 4**



**0 3 . 1**

Outline a plan to investigate how the rate of this reaction changed when the concentration of the hydrochloric acid was changed.

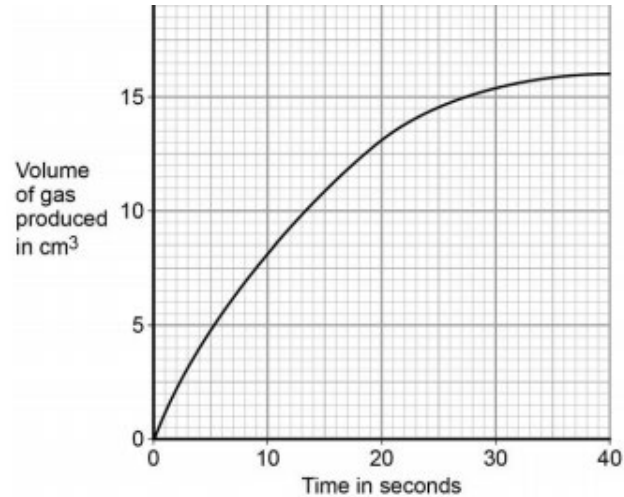
- Describe how you would do the investigation and the measurements you would make.
- Describe how you would make it a fair test.

You do **not** need to write about safety precautions.

**[6 marks]**

15% of GCSE marks in exams come  
from questions relating to practicals.

# DATA ANALYSIS AND EVALUATION



If data is given, use it!



Draw a tangent to the curve at 20 seconds.

Determine the rate of the reaction at 20 seconds by calculating the gradient of the tangent.

Give the unit.

[4 marks]

---

---

---

---

---

---

Rate of reaction = \_\_\_\_\_

Unit = \_\_\_\_\_

0 2 . 5

A driver wishes to buy a new car.

**Table 1** gives some data about an electric car and one with a petrol engine.

**Table 1**

	Electric car	Petrol engine car
Cost (£)	27 000	15 000
Running cost per year (£)	250	2 000
Average lifetime (years)	12	12

Which car would be the most economic over its 12 year lifetime?

Use data from **Table 1** to support your answer.

You should include the difference in cost in your answer.

[4 marks]

# AQA - INSIGHT FROM THE LAST PREVIOUS EXAMS

Prepare for unfamiliar contexts

**GCSE biology students are sharing their horror at a tough, carrot-based question**

These students are numbing the pain of a difficult exam with hilarious Tweets.



Biology students weren't expecting a question about carrots in their GCSE exam

# AQA - INSIGHT FROM THE LAST PREVIOUS EXAMS

Prepare for unfamiliar contexts

Read the question carefully too ensure you know what is being asked, understand the command words

Don't waste space repeating the question

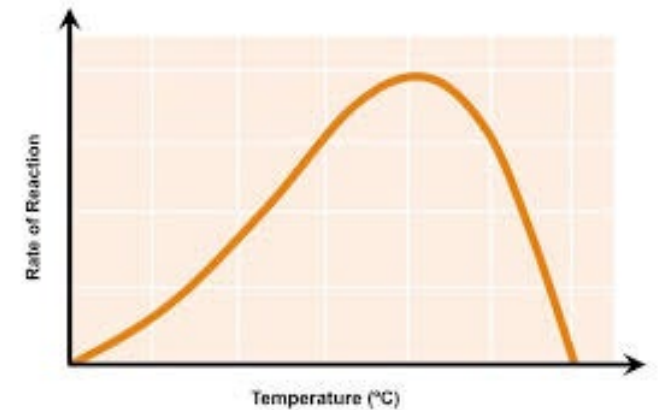
Read through your work to check for errors

Be specific in your responses don't use 'it' or 'they'

Make sure you understand why each step in the practical is important

Maths - Show your working out in maths questions

- Check for significant figures
- Don't round answers until you reach the final answer



# WHAT YOU CAN DO AS A PARENT - GET INVOLVED!

Help them **plan** their revision – small chunks

Question them using the revision guides

Mark the papers for them, the answers are available on exam board websites

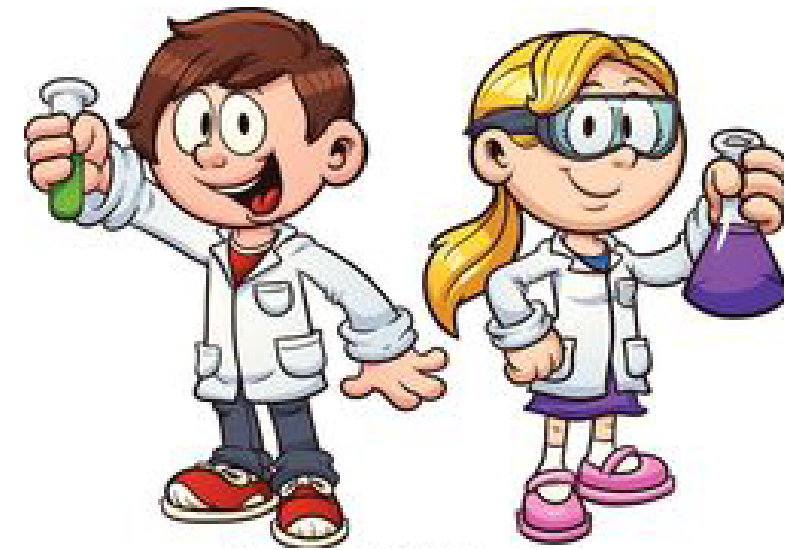
Provide a calm environment..... remove distractions

Breakfast before exams!

Right equipment on the day..... Calculator!

Sleep!

Any questions please ask



*Good luck  
in your  
Assessments*

You'll be AMAZING,  
I asked around -  
We all agreed!

