



EXAM CHANGES 2022

GCSE Combined Science Trilogy Advanced Information

Higher Tier

Exam Board: AQA

SUMMARY OF ADAPTATIONS

- A list of topics for major focus and topics not assessed in each paper has been published.
- For *the **Physics papers only*** students will be provided with an equation sheet which **must be** used in the exam.
- The format/structure of the exam papers will be the same as usual.
- Students will need to apply the knowledge gained through lessons to interpret unfamiliar information provided with the exam question.
- Assessment of practical skills, maths skills and scientific skills will occur throughout all of the papers.

HOW THE SCHOOL IS USING THIS INFORMATION

- Practice and mock exams will be adapted to reflect summer 2022 exams.
- Intervention sessions will focus on the topics for each paper.
- Revision plans will be updated to reflect the major focuses.
- Physics teaching will incorporate lessons on the utilisation of the given equation sheet rather than having to remember the equations themselves.
- All students will have a copy of the equation sheet to stick into their Physics book.
- Revision will be focussed on specific topics for each paper.

WHAT STUDENTS SHOULD DO

- The following information is split between Paper 1 and Paper 2 for each subject.
- All page numbers given refer to *the **CGP GCSE AQA Combined Science Revision books*** which students were given in year 10.
- For each paper there is a list for the **main focus** of each exam, students should ensure they have revised these areas thoroughly.
- For each paper, there is a list of topics **not assessed** in the exams, the revision page numbers are listed so students know to skip those pages during their revision.
- **Any topics not identified on either of these lists could appear in 1-2 mark questions, multiple choice questions or via questions which link with other topics. Students therefore need to ensure they have a good understanding of all topics.**
- The required practical activities which will be assessed are also listed, along with a page of the revision guide.
- Attend Period 6 Science revision sessions every Tuesday (Lab 2) or Thursday (Lab 3). Teachers will be delivering specific topics focussed on the GCSE exam. Alternatively, you could attend the Wednesday lunchtime revision session at 1:25 until 1:50pm (Lab 4). Miss Cassidy is available in Lab 2 on Monday, Wednesday and Thursday lunchtimes for any other specific queries.

Biology Paper 1

Major Focus		Not assessed	
Topic	Pages	Topic	Pages
<i>Chromosomes, mitosis and the cell cycle</i>	15	<i>Microscopy</i>	12-13
<i>Stem cells</i>	16	<i>Diffusion</i>	17
<i>The human digestive system</i>	27-28	<i>Osmosis</i>	18
<i>The heart and blood vessels</i>	31-32	<i>Active transport</i>	19
<i>Blood</i>	33	<i>Plant Tissue</i>	39
<i>Coronary heart disease: a non-communicable disease</i>	34-35	<i>Plant organ systems</i>	39-41
<i>Health issues</i>	36	<i>Viral diseases, fungal and protist diseases</i>	44
<i>The effect of life-style on some non-communicable diseases</i>	37	<i>Bacterial diseases</i>	45
<i>Cancer</i>	38	<i>Fighting disease – human defence systems</i>	46
<i>Photosynthetic reaction</i>	50	<i>Use of glucose from photosynthesis</i>	50
<i>Rate of photosynthesis</i>	51-53	<i>Response to exercise</i>	56
Required practical activity 3: test for a range of carbohydrates, lipids and proteins - Page 29 Required practical 4: investigate the effect of pH on the rate of reaction of amylase enzyme, Page 26 Required practical activity 5: investigate the effect of light on the rate of photosynthesis of pondweed – Page 52-53			

Biology Paper 2

Major Focus		Not assessed	
Topic	Pages	Topic	Pages
<i>The endocrine system</i>	62	<i>The nervous system</i>	59-61
<i>Control of blood glucose concentration</i>	63	<i>Contraception</i>	65
<i>Hormones in human reproduction</i>	64	<i>Sexual and asexual reproduction</i>	69
<i>The use of hormones to treat human infertility</i>	66	<i>DNA and the genome</i>	68
<i>Feedback systems</i>	67	<i>Genetic inheritance</i>	72-3
<i>Levels or organisation in an ecosystem</i>	86	<i>Inherited disorders</i>	74
<i>How materials are cycled</i>	89-90	<i>Sex determination</i>	71
<i>Biodiversity</i>	91	<i>Variation</i>	75
<i>Waste management</i>	91	<i>Evolution</i>	76
<i>Global warming</i>	92	<i>Selective breeding</i>	77
<i>Maintaining biodiversity</i>	94	<i>Genetic engineering</i>	78
		<i>Evidence for evolution</i>	76
		<i>Fossils</i>	79
		<i>Extinction</i>	76
		<i>Resistant bacteria</i>	80
		<i>Adaptations</i>	85
		<i>Land use and deforestation</i>	93
Required practical activity 7: use sampling techniques to measure the population size of a common species in a habitat - Pages 87-88, 240			

Chemistry Paper 1

Major Focus		Not assessed	
Topic	Pages	Topic	Pages
<i>Properties of ionic compounds</i>	114	N/A	N/A
<i>Properties of simple molecules structures</i>	116		
<i>Polymers and giant covalent</i>	117		
<i>Properties of metals and alloys</i>	119		
<i>States of matter (including state symbols)</i>	120-121		
<i>Moles amounts of substances in equations</i>	124-125		
<i>Using moles to balance equations</i>	126		
<i>Limiting reactants</i>	127		
<i>Concentrations of solutions</i>	128		
<i>The pH scale and neutralisation</i>	129		
<i>Strong and weak acids, reactions of acids</i>	130-131		
<i>The reactivity series</i>	132		
<i>Separating metals from metal oxides</i>	133		
<i>Redox reactions</i>	134		
<i>Electrolysis</i>	135-136		
<i>Exothermic and Endothermic reactions</i>	138-140		
<p>Required practical activity 8: preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate - Page 131</p> <p>Required practical activity 9: investigate what happens when aqueous solutions are electrolysed using inert electrodes - Page 136, 236</p> <p>Required practical activity 10: investigate the variables that affect temperature changes in reacting solutions such as, e.g., acid plus metals, acid plus carbonates, neutralisations, displacement of metals - Page 139</p>			

Chemistry Paper 2

Major Focus		Not assessed	
Topic	Pages	Topic	Pages
<i>Rates of reaction and factors affecting it</i>	142-143	<i>Tests for gases</i>	155
<i>Calculating rates of reaction</i>	144-146		
<i>Reversible reactions</i>	147		
<i>The effect of changing conditions, on equilibrium</i>	148		
<i>Hydrocarbons and their properties</i>	150		
<i>Fractional distillation and petrochemicals</i>	151		
<i>Cracking and alkenes</i>	152		
<i>Purity and formulations</i>	153		
<i>Paper chromatography</i>	154		
<i>The Earth's atmosphere</i>	157		
<i>Atmospheric pollutants from fuels</i>	160		
<i>Sustainable development</i>	161-162		
<i>Potable water, waste water treatment</i>	164-165		
<p>Required practical activity 11: investigate how changes in concentration affect the rates of reactions - Page 144-145</p> <p>Required practical activity 12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances and calculate R_f values – Page 100, 154</p>			

Physics Paper 1

Major Focus		Not assessed		
Topic	Pages	Topic	Pages	
<i>Energy stores and systems</i>	167	<i>Series and parallel circuits</i>	183-184	
<i>Kinetic and potential energy stores</i>	168	<i>Electricity in the home</i>	186	
<i>Power</i>	187-188	<i>Internal energy</i>	Part 193	
<i>The National Grid</i>	189	<i>Specific Latent heat</i>	194	
<i>The particle model and motion in gases</i>	191			
<i>Density of materials</i>	192			
<i>Changes of state</i>	193			
<i>Developing the model of the atom</i>	195			
<i>Isotopes and nuclear radiation</i>	196			
<i>Nuclear equations</i>	197			
<i>Half-life</i>	198			
<i>Irradiation and contamination</i>	199			
<p>Required practical activity 14: an investigation to determine the specific heat capacity of one or more materials - Page 169</p> <p>Required practical activity 16: use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature - Page 181</p>				

Physics Paper 2

Major Focus		Not assessed	
Topic	Pages	Topic	Pages
<i>Vector/scalar, contact/non-contact forces</i>	201	<i>Forces and elasticity</i>	205-206
<i>Weight, Mass and Gravity</i>	202	<i>Stopping distances and reaction times</i>	214-215
<i>Resultant forces and calculating forces</i>	203-204	<i>Permanent and Induced Magnets</i>	227
<i>Distance, displacement, speed, velocity</i>	207		
<i>Acceleration</i>	208		
<i>Distance-Time and Velocity-Time graphs</i>	209		
<i>Terminal Velocity</i>	210		
<i>Newton's 1st, 2nd and 3rd laws</i>	211-212		
<i>Momentum</i>	216		
<i>Wave behaviour and Electromagnetic waves</i>	220		
<i>Refraction</i>	221		
<i>Types of electromagnetic waves and their uses</i>	222-224		
<i>Dangers of electromagnetic waves</i>	226		
<i>Electromagnetism</i>	228		
<i>The Motor Effect</i>	229		
<i>Electric Motors</i>	230		
<p>Required practical activity 21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface - Pages 225</p>			

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 = mass \times gravitational field strength \times height	$E_p = m g h$
change in thermal energy = mass \times specific heat capacity \times 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 = current \times time	$Q = I t$
potential difference = current \times resistance	$V = I R$
power = potential difference \times current	$P = V I$
power = (current) ² \times resistance	$P = I^2 R$
energy transferred = power \times time	$E = P t$

	energy transferred = charge flow × potential difference	$E = Q V$
HT	potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil	$V_p I_p = V_s I_s$
	density = $\frac{\text{mass}}{\text{volume}}$	$\rho = \frac{m}{V}$
	thermal energy for a change of state = mass × specific latent heat	$E = m L$
	weight = mass × gravitational field strength	$W = m g$
	work done = force × distance (along the line of action of the force)	$W = F s$
	force = spring constant × extension	$F = k e$
	distance travelled = speed × time	$s = v t$
	acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{\Delta v}{t}$
	(final velocity) ² – (initial velocity) ² = 2 × acceleration × distance	$v^2 - u^2 = 2 a s$
	resultant force = mass × acceleration	$F = m a$
HT	momentum = mass × velocity	$p = m v$
	period = $\frac{1}{\text{frequency}}$	$T = \frac{1}{f}$
	wave speed = frequency × wavelength	$v = f \lambda$
HT	force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length	$F = B I l$

The Periodic Table of Elements

1	2	3	4	5	6	7	0	
7 Li lithium 3	9 Be beryllium 4	11 Na sodium 11	12 C carbon 6	13 Al aluminium 13	14 N nitrogen 7	15 O oxygen 8	16 F fluorine 9	17 Ne neon 10
19 K potassium 19	20 Ca calcium 20	23 Sc scandium 21	24 Ti titanium 22	25 V vanadium 23	26 Cr chromium 24	27 Mn manganese 25	28 Fe iron 26	29 Co cobalt 27
37 Rb rubidium 37	38 Sr strontium 38	39 Y yttrium 39	40 Zr zirconium 40	41 Nb niobium 41	42 Mo molybdenum 42	43 Tc technetium 43	44 Ru ruthenium 44	45 Rh rhodium 45
55 Cs caesium 55	56 Ba barium 56	57 La* lanthanum 57	72 Hf hafnium 72	73 Ta tantalum 73	74 W tungsten 74	75 Re rhenium 75	76 Os osmium 76	77 Ir iridium 77
87 Fr francium 87	88 Ra radium 88	89 Ac* actinium 89	104 Rf rutherfordium 104	105 Db dubnium 105	106 Sg seaborgium 106	107 Bh bohrium 107	108 Hs hassium 108	109 Mt meitnerium 109
133 Cs caesium 133	137 Ba barium 137	139 La* lanthanum 139	178 Hf hafnium 178	181 Ta tantalum 181	184 W tungsten 184	186 Re rhenium 186	190 Os osmium 190	192 Ir iridium 192
85 Rb rubidium 85	88 Sr strontium 88	89 Y yttrium 89	91 Zr zirconium 91	93 Nb niobium 93	96 Mo molybdenum 96	[97] Tc technetium 97	101 Ru ruthenium 101	103 Rh rhodium 103
119 K potassium 119	120 Ca calcium 120	121 Sc scandium 121	122 Ti titanium 122	123 V vanadium 123	124 Cr chromium 124	125 Mn manganese 125	126 Fe iron 126	127 Co cobalt 127
131 Xe xenon 131	132 Kr krypton 132	133 Rn radon 133	134 At astatine 134	135 Po polonium 135	136 Bi bismuth 136	137 Pb lead 137	138 Tl thallium 138	139 Pb lead 139
127 I iodine 127	128 Te tellurium 128	129 Sb antimony 129	130 Sn tin 130	131 In indium 131	132 Cd cadmium 132	133 Hg mercury 133	134 Tl thallium 134	135 Pb lead 135
35 Br bromine 35	36 Kr krypton 36	37 Rn radon 37	38 At astatine 38	39 Po polonium 39	40 Bi bismuth 40	41 Pb lead 41	42 Tl thallium 42	43 Pb lead 43
80 Br bromine 80	81 Kr krypton 81	82 Rn radon 82	83 At astatine 83	84 Po polonium 84	85 Bi bismuth 85	86 Pb lead 86	87 Tl thallium 87	88 Pb lead 88
53 I iodine 53	54 Xe xenon 54	55 Rn radon 55	56 At astatine 56	57 Po polonium 57	58 Bi bismuth 58	59 Pb lead 59	60 Tl thallium 60	61 Pb lead 61
17 Cl chlorine 17	18 Ar argon 18	19 Kr krypton 19	20 At astatine 20	21 Po polonium 21	22 Bi bismuth 22	23 Pb lead 23	24 Tl thallium 24	25 Pb lead 25
32 S sulfur 32	33 Ar argon 33	34 Kr krypton 34	35 At astatine 35	36 Po polonium 36	37 Bi bismuth 37	38 Pb lead 38	39 Tl thallium 39	40 Pb lead 40
79 Se selenium 79	80 Kr krypton 80	81 Rn radon 81	82 At astatine 82	83 Po polonium 83	84 Bi bismuth 84	85 Pb lead 85	86 Tl thallium 86	87 Pb lead 87
15 P phosphorus 15	16 S sulfur 16	17 Cl chlorine 17	18 Ar argon 18	19 Kr krypton 19	20 Rn radon 20	21 Po polonium 21	22 At astatine 22	23 Po polonium 23
5 B boron 5	6 C carbon 6	7 N nitrogen 7	8 O oxygen 8	9 F fluorine 9	10 Ne neon 10	11 Na sodium 11	12 Mg magnesium 12	13 Al aluminium 13
1 H hydrogen 1	2 He helium 2	3 Li lithium 3	4 Be beryllium 4	5 B boron 5	6 C carbon 6	7 N nitrogen 7	8 O oxygen 8	9 F fluorine 9

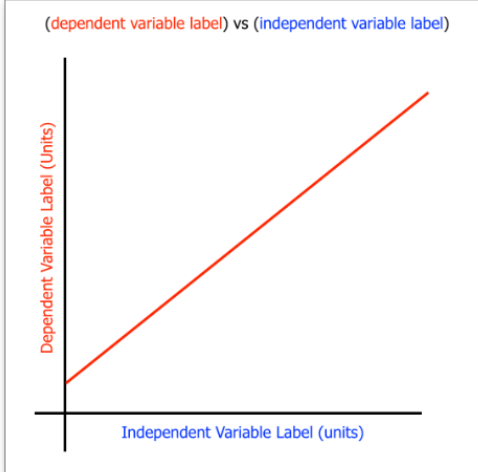
Key

relative atomic mass
atomic symbol
name
atomic (proton) number

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted. Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

Top 10 Tips for Students

Maths in Science

1	Learn equations with look, cover, say, write . Use them in lessons where appropriate & with homework.	<h3 style="margin: 0;">9 Think SUCCESS!</h3> <p>Search for what to find</p> <p>Underline values</p> <p>Copy values and units</p> <p>Convert values</p> <p>Equations – <i>rearrange if necessary</i></p> <p>Substitute values</p> <p>Solve the equation</p>
2	Revise maths based questions – look for a maths based question for each topic.	
3	Know your units . Most calculations expect you to put a unit after the number. Can you recall units? e.g. Time – seconds, minutes, hours. Distance – millimetres, centimetres, metres, Make a set of flashcards to help you learn them.	
4	<p>Calculate a mean. e.g.</p> $\text{Mean} = \frac{\text{try 1} + \text{try 2} + \text{try 3}}{\text{number of tries}}$ <p>Check the data first – look for ‘weird tries’ and take those out first.</p>	
5	Quoting an appropriate number of significant figures. If each result is quoted to 2 significant figures – <i>your answer should also be 2 significant figures</i>	
6	<p>Make your calculator your friend: Practice using the brackets, fraction button and settings. Do you get the right answer each time? Can you use your calculator to convert between fractions and percentages?</p>	<h3 style="margin: 0;">10 Know your graphs</h3> <p>Bar chart = categoric & discrete data Line graph = continuous data</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; font-size: small;">(dependent variable label) vs (independent variable label)</p>  </div> <p>Always check your plots for accuracy.</p>
7	<p>Work it out in Science <u>in exactly the same way as you do in Maths!</u> Round in the same way. Estimate in the same way Write in standard form in the same way</p>	
8	Bring the equipment you need to lessons and exams. You will need in every lesson <i>and</i> exam a black pen, a 2B pencil, a ruler and a calculator.	