CARDINAL NEWMAN CATHOLIC SCHOOL

Cardinal Newman Science Department

AQA

GCSE Combined Science

Course Handbook

2024

Combined Science AQA

CARDINAL NEWMAN CATHOLIC SCHOOL

Biology

Paper 1:

B1- Cell Biology

B2- Organisation

B3- Infection & Response

B4- Bioenergetics

Paper 2:

B5- Homeostasis & Response

B6- Inheritance, Variation & Evolution

B7- Ecology

Combined Science AQA

CARDINAL NEWMAN CATHOLIC SCHOOL

Chemistry

Paper 1:

C1- Atomic structure & the periodic table

C2- Bonding, structure & the properties of matter

C3- Quantitative Chemistry

Previous attachment

C4- Chemical Changes

C5- Energy Changes

Paper 2:

C6- The rate and extent of chemical change

C7- Organic chemistry

C8- Chemical analysis

C9- Chemistry of the atmosphere

C10- Using resources

Combined Science AQA

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Physics

Paper 1:

P1- Energy

P2- Electricity

P3- Particle model of matter

P4- Atomic structure

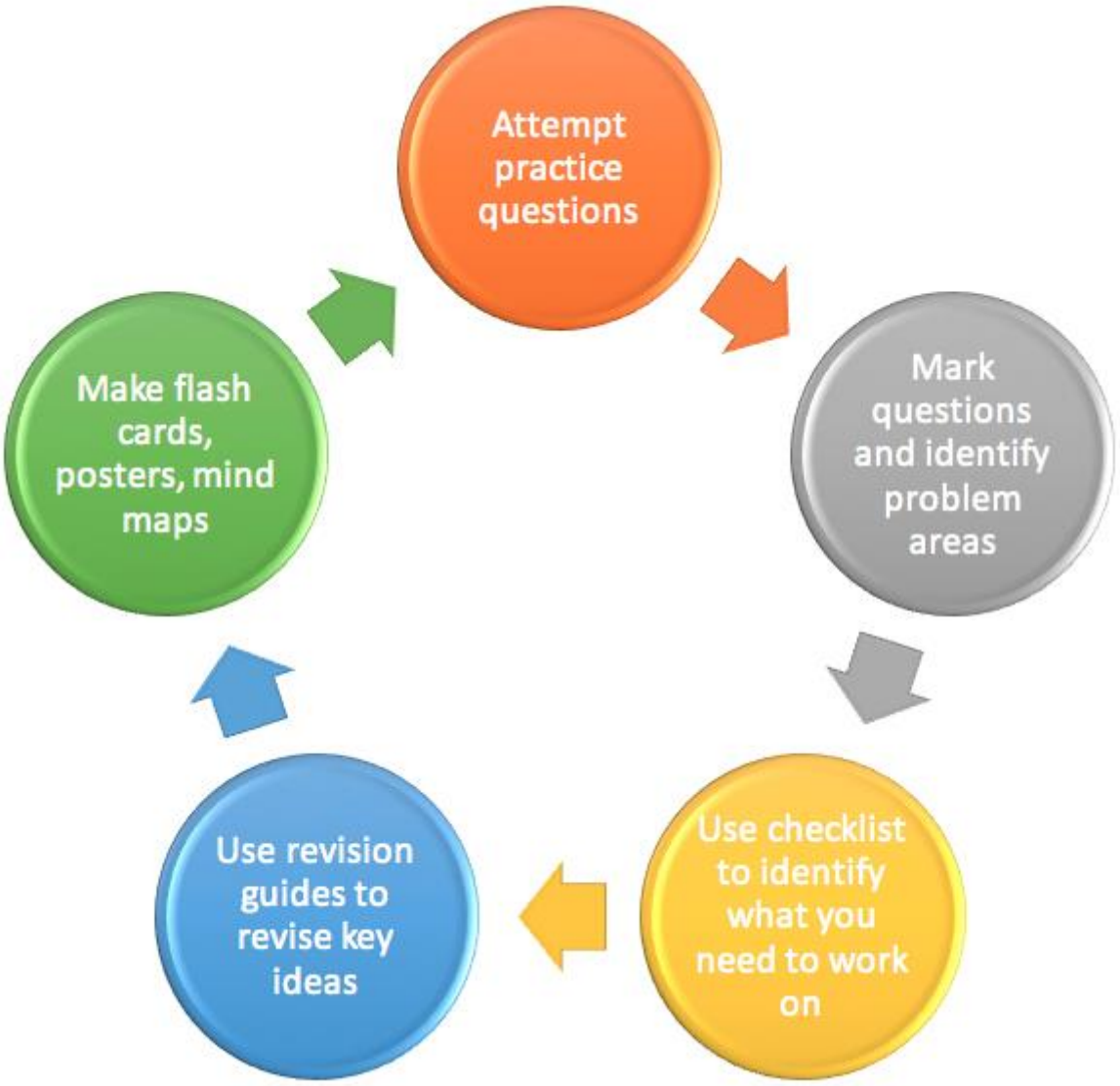
Paper 2

P5- Forces

P6- Waves

P7- Magnetism and electromagnetism

The revision cycle



AQA GCSE Trilogy Combined Science

Students study Biology, Chemistry and Physics and are awarded two GCSE grades between 9-9 and 1-1.

Specification

The specification can be found via a Google search for “AQA Trilogy GCSE Combined Science” or by using the QR code below.

Past Exam Papers

The exam papers from 2018 can be found via a Google search for “AQA Trilogy GCSE Combined Science past papers” or by using the QR code below.

Exam Papers

Paper	Duration
Biology Paper 1	1hr 15 min
Chemistry Paper 1	1hr 15 min
Physics Paper 1	1hr 15 min
Biology Paper 2	1hr 15 min
Chemistry Paper 2	1hr 15 min
Physics Paper 2	1hr 15 min

Recommended Revision Resources

CGP Books publish a wide range of revision resources for AQA GCSE Combined Science. They are widely available.

HIGHER Tier

Revision Guides	ISBN	CGP Code
New GCSE Combined Science AQA Higher Complete Revision & Practice w/ Online Ed, Videos & Quizzes	9781789085778	SCAHS42
Revision Question Cards		
9-1 GCSE Combined Science: Biology AQA Revision	9781789080551	SCBAF41
9-1 GCSE Combined Science: Chemistry AQA Revision	9781789080568	SCCAF41
9-1 GCSE Combined Science: Physics AQA Revision	9781789080575	SCPAF41
OR		
New 9-1 GCSE Combined Science AQA Revision Question Cards: All-in-one Biology, Chemistry & Physics	9781789084665	SCAF41

Foundation Tier

Revision Guides	ISBN	CGP Code
New GCSE Combined Science AQA Foundation Complete Revision & Practice w/ Online Ed, Videos & Quizzes	9781789085785	SCAFS42
Revision Question Cards		
9-1 GCSE Combined Science: Biology AQA Revision	9781789080551	SCBAF41
9-1 GCSE Combined Science: Chemistry AQA Revision	9781789080568	SCCAF41
9-1 GCSE Combined Science: Physics AQA Revision	9781789080575	SCPAF41
OR		
New 9-1 GCSE Combined Science AQA Revision Question Cards: All-in-one Biology, Chemistry & Physics	9781789084665	SCAF41

All Courses - Maths Skills	ISBN	CGP Code
Grade 9-1 GCSE Science: Essential Maths Skills - Study & Practice	9781782947042	SMR42

Online Revision

BBC Bitesize

BBC Bitesize has a comprehensive series of revision materials specifically for AQA Combined Science. These include notes, videos and tests. These can be found, for all three sciences by doing a Google search for “BBC Bitesize AQA combined science” or by using the QR code below.

My-gcsescience

my-gcsescience.com is a website that offers a series of packages of science revision materials. The most basic is free but, still worth signing up for. There are two paid packages. However, there are also a number of AQA specific videos available free on Youtube which you can find by using the QR code below.

Primrose Kitten

Don't be fooled by the name, primrosekitten.com is full of useful resources for science revision. The website is the homepage for a Youtube channel of a science teacher.

Physics and Maths Tutor

Not just a website for Physics and Maths but, Chemistry and Biology too. Go to the homepage physicsandmathstutor.com and click on the science you want to revise. Remember you're doing AQA.

Maths Skills

Up to 20% of the marks on Combined Science exam papers are awarded for the application of maths skills such as drawing and interpreting graphs, percentages, ratios, rearranging equations and significant figures. Edexcel have produced a useful guide that can be obtained by using the QR code below. (It's also relevant to AQA)

Content examined on Biology Combined Science papers

Topics 1 to 4 are on Paper 1. Topics 5 to 7 are on Paper 2

1. **Cell Biology**
   Eukaryotes and prokaryotes, animal and plant cells, cell division, transport in cells.
   Required practical activity 1: use a light microscope.
2. **Organisation**
   Principles of organisation, animal tissues, organs and organ systems, plant tissues, organs and systems.
3. **Infection and Response**
   Viral and bacterial diseases, vaccination, antibiotics and painkillers
4. **Bioenergetics**
   Photosynthesis, respiration. Oxygen debt(H), Role of Liver (H)
   Required practical activity 2: investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.
   Required practical activity 3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.
   Required practical activity 4: investigate the effect of pH on the rate of reaction of amylase enzyme.
   Required practical activity 5: investigate the effect of light intensity on the rate of photosynthesis
5. **Homeostasis and Response**
   Homeostasis, the human nervous system, hormonal coordination in humans, hormones in human reproduction. Glucagon and Blood glucose (H)
   Required practical activity 6: plan and carry out an investigation into the effect of a factor on human reaction time.
6. **Inheritance, variation and evolution**
   Reproduction, variation and evolution, development of genetics and evolution, classification of living organisms. Genetic Engineering(H), Infertility Treatments (H), Punnet Square (H)
7. **Ecology**
   Adaptations, interdependence and competition, organisation of an ecosystem, biodiversity.
   Required practical activity 7: measure the population size of a common species in a habitat.

Content examined on Chemistry Combined Science papers

Topics 8 to 12 are on Paper 1. Topics 13 to 17 are on Paper 2

8. **Atomic Structure and the Periodic Table**
   A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes, the periodic table.
9. **Bonding, Structure and Properties of Matter**
   Chemical bonds, ionic, covalent and metallic, how bonding and structure are related to the properties of
   Substances, structure and bonding of carbon.
10. **Quantitative Chemistry**
    Chemical measurements, conservation of mass and balanced chemical equations, relative formula mass, use of amount of substance in relation to masses of pure substances, mole (HT only), amounts of substances in equations (HT only), concentration of solutions.
11. **Chemical Changes**
    Reactivity of metals, reactions of acids, electrolysis. Ionic equation (H), Redox reaction (H)
    Required practical activity 8: preparation of a pure, dry sample of a soluble salt.
    Required practical activity 9: investigate what happens when aqueous solutions are electrolysed using inert electrodes. Half Equations (H)
12. **Energy Changes**
    Exothermic and endothermic reactions, reaction profiles.
    Required practical activity 10: investigate the variables that affect temperature changes in reacting solutions.
13. **Rate and Extent of Chemical Change**
    Rate of reaction, reversible reactions and dynamic equilibrium.
    Required practical activity 11: investigate how changes in concentration affect the rates of reactions.
14. **Organic Chemistry**
    Carbon compounds as fuels and feedstock, crude oil, hydrocarbons and alkanes, fractional distillation, properties of hydrocarbons, cracking and alkenes. Polypeptides(H), Proteins(H)
15. **Chemical Analysis**
    Purity, formulations and chromatography, identification of common gases.
    Required practical activity 12: investigate how paper chromatography can be used to separate coloured substances.
    Required practical activity 13: analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.
16. **Chemistry of the Atmosphere**
    The composition and evolution of the Earth's atmosphere, carbon dioxide and methane as greenhouse gases, common atmospheric pollutants and their sources.
17. **Using Resources**
    Potable water, alternative methods of extracting metals (HT only), life cycle assessment and recycling metal extraction(H)

Content examined on Physics Combined Science papers

Topics 18 to 21 are on Paper 1. Topics 22 to 24 are on Paper 2

18. **Energy**

    Energy stores and systems, energy changes in systems, power, conservation and dissipation of energy, national and global energy resources. Improving Efficiency (H)

    Required practical activity 14: an investigation to determine the specific heat capacity of one or more materials.

19. **Electricity**

    Current, potential difference and resistance, series and parallel circuits, domestic uses and safety, energy transfers, the National Grid.

    Required practical activity 15: use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits.

    Required practical activity 16: use circuit diagrams to construct appropriate circuits.

20. **Particle Model of Matter**

    Changes of state and the particle model, internal energy and energy transfers, particle model and pressure.

    Required practical activity 17: use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids.

21. **Atomic Structure**

    Atoms and isotopes, atoms and nuclear radiation.

22. **Forces**

    Forces and their interactions, work done and energy transfer, forces and elasticity, forces and motion, momentum (HT only), Velocity -Time graphs (HT), Inertia(H)

    Required practical activity 18: investigate the relationship between force and extension for a spring.

    Required practical activity 19**:** investigate the effect of varying the force on the acceleration of an object of constant mass.

23. **Waves**

    Transverse and longitudinal waves, electromagnetic waves. Carrier Waves +Signals (H)

    Required practical activity 20: make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank.

    Required practical activity 21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface

24. **Magnetism and Electromagnetism**

    Permanent and induced magnetism, magnetic forces and fields, the motor effect.

AQA GCSE Science Command Words

These command words tell you what to you need to do when you are doing exam questions.

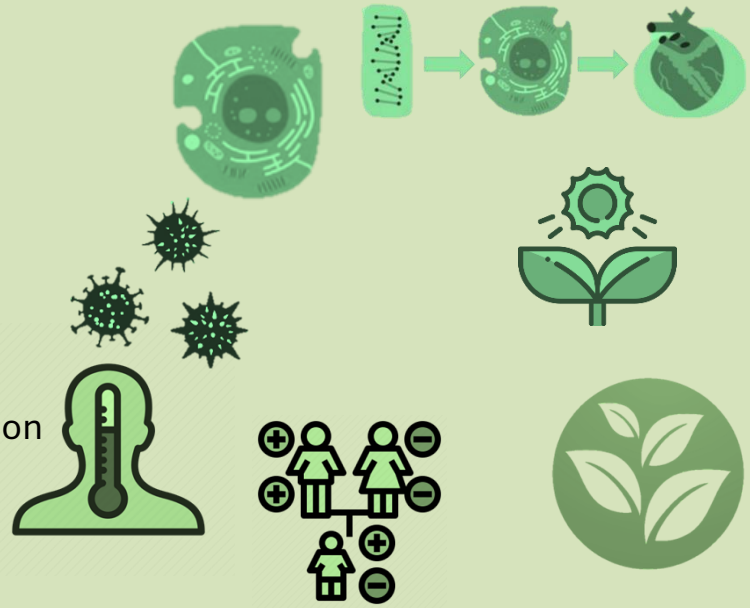
Balance	Students need to balance a chemical equation.
Calculate	Students should use numbers given in the question to work out the answer.
Choose	Select from a range of alternatives.
Compare	This requires the student to describe the similarities and/or differences between things, not just write about one.
Complete	Answers should be written in the space provided, for example, on a diagram, in spaces in a sentence or in a table.
Define	Specify the meaning of something.
Describe	Students may be asked to recall some facts, events or process in an accurate way.
Design	Set out how something will be done.
Determine	Use given data or information to obtain and answer.
Draw	To produce, or add to, a diagram.
Estimate	Assign an approximate value.
Evaluate	Students should use the information supplied, as well as their knowledge and understanding, to consider evidence for and against when making a judgement.
Explain	Students should make something clear, or state the reasons for something happening.
Give	Only a short answer is required, not an explanation or a description.
Identify	Name or otherwise characterise.
Justify	Use evidence from the information supplied to support an answer.
Label	Provide appropriate names on a diagram.
Measure	Find an item of data for a given quantity.
Name	Only a short answer is required, not an explanation or a description. Often it can be answered with a single word, phrase or sentence.
Plan	Write a method.
Plot	Mark on a graph using data given.
Predict	Give a plausible outcome.
Show	Provide structured evidence to reach a conclusion.
Sketch	Draw approximately.
Suggest	This term is used in questions where students need to apply their knowledge and understanding to a new situation.
Use	The answer must be based on the information given in the question. Unless the information given in the question is used, no marks can be given. In some cases students might be asked to use their own knowledge and understanding.
Write	Only a short answer is required, not an explanation or a description.

AQA Combined Science Checklist

Biology

Paper 1 (1 hour 15 minutes)
Tuesday 13th May 2025 (PM)
B1: Cell Biology
B2: Organisation
B3: Infection and response
B4: Bioenergetics

Paper 2 (1 hour 15 minutes)
Monday 9th June 2025 (AM)
B5:Homeostasis
B6: Inheritance, variation and evolution
B7: Ecology



BIOLOGY Paper 1

B1: Cell Biology

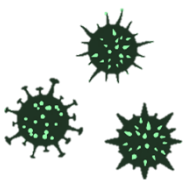
Areas to revise:	CGP Guide Pages
Cells	11
Microscopy	12
More on Microscopy	13
Cell Differentiation and Specialization	14
Chromosomes and Mitosis	15
Stem Cells	16
Diffusion	17
Osmosis	18
Active Transport	19
Exchange Surfaces	20
Exchanging Substances	21

B2: Organisation

Areas to revise:	CGP Guide Pages
Cell Organization	24
Enzymes.	25
Investigating Enzymatic Reactions	26
Enzymes and Digestion	27
More on Enzymes and Digestion	28
Food Tests	29
The Lungs	30
Circulatory System - The Heart	31
Circulatory System - Blood Vessels	32
Circulatory System - Blood	33
Cardiovascular Disease	34
More on Cardiovascular Disease	35
Health and Disease	36
Risk Factors for Non-Communicable Diseases	37
Cancer	38
Plant Cell Organization	39
Transpiration and Translocation	40
Transpiration and Stomata	41

B3: Infection and response

Areas to revise:	CGP Guide Pages
Communicable Disease	43
Viral, Fungal and Protist Diseases	44
Bacterial Diseases and Preventing Disease	45
Fighting Disease	46
Fighting Disease - Vaccination_	47
Fighting Disease - Drugs	48
Developing Drugs	49



B4: Bioenergetics		
Areas to revise:	**CGP Guide Pages**	
Photosynthesis and Limiting Factor	50	
The Rate of Photosynthesis	51	
Respiration and Metabolism	54	
Aerobic and Anaerobic Respiration	55	
Exercise	56	

BIOLOGY Paper 2

B5:Homeostasis

Areas to revise:	CGP Guide Pages
Homeostasis	58
The Nervous System	59
Synapses and Reflexes	60
Investigating Reaction Time	61
The Endocrine System	62
Controlling Blood Glucose	63
Puberty and the Menstrual Cycle	64
Controlling Fertility	65
More on Controlling Fertility	66
Adrenaline and Thyroxine	67

B6: Inheritance, variation and evolution

Areas to revise:	CGP Guide Pages
DNA	68
Reproduction	69
Meiosis	70
X and Y Chromosomes	71
Genetic Diagrams	72
More Genetic Diagrams	73
Inherited Disorders	74
Variation	75
Evolution	76
Selective Breeding	77
Genetic Engineering	78
Fossils	79
Antibiotic-Resistant Bacteria (H)	80
Classification	81

B7: Ecology

Areas to revise:	CGP Guide Pages
Competition	83
Abiotic and Biotic Factors	84
Adaptations	85
Food Chains	86
Using Quadrats	87
Using Transects	88
The Water Cycle	89
The Carbon Cycle	90
Biodiversity and Waste Management	91
Global Warming	92
Deforestation and Land Use	93
Maintaining Ecosystems and Biodiversity	94

Physics

Paper 1 (1 hour 15 minutes)

22nd May 2025 (AM)

P1: Energy

P2: Electricity

P3: Particle model of matter

P4: Atomic structure

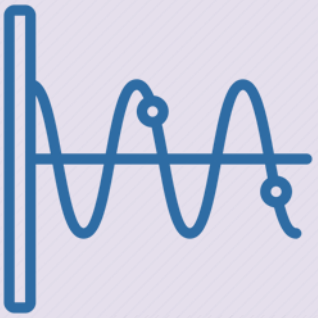
Paper 2 (1 hour 15 minutes)

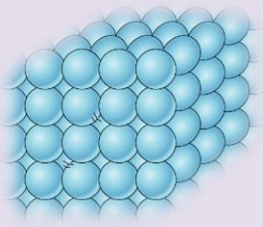
16th June 2025 (PM)

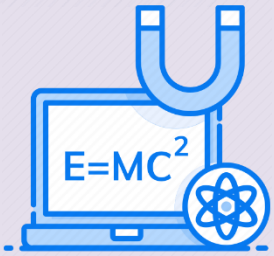
P5: Forces

P6: Waves

P7: Magnetism



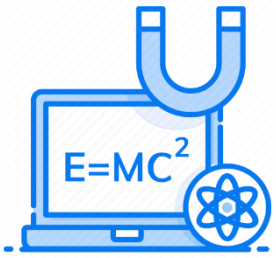




Physics Paper 1

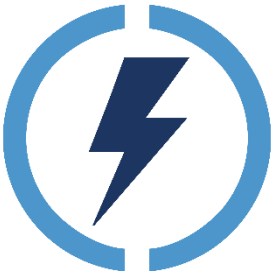
P1 Energy

Areas to revise:	CGP Guide Pages
Kinetic and Potential Energy Stores	168
Specific Heat Capacity	169
Conservation of Energy and Power	170
Reducing Unwanted Energy Transfers	171
Efficiency	172
Energy Resources and Their Uses	173
Wind, Solar and Geothermal	174
Hydro-electricity, Waves and Tides	175
Bio-fuels and Non-renewables	176
Trends in Energy Resource Use	177



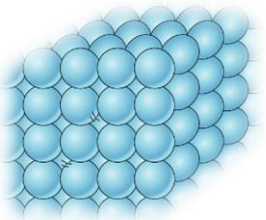
P2 Electricity

Areas to revise:	CGP Guide Pages
Current and Circuit Symbols	179
Resistance and V = IR	180
Resistance and I-V Characteristics	181
Circuit Devices	182
Series Circuits	183
Parallel Circuits	184
Investigating Resistance (H)	185
Electricity in the Home	186
Power of Electrical Appliances	187
More on Power	188
The National Grid	189



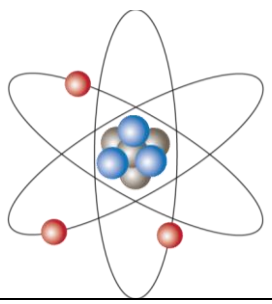
P3 Particle model of matter

Areas to revise:	CGP Guide Pages
The Particle Model and Motion in Gases	191
Density of Materials	192
Internal Energy and Changes of State	193
Specific Latent Heat	194

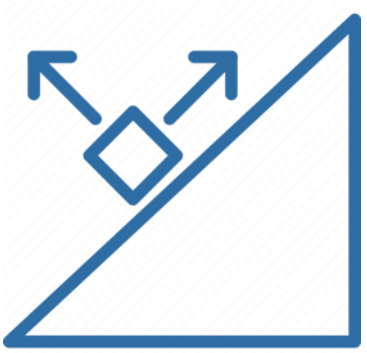


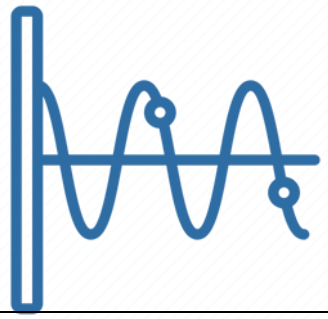
P4 Atomic Structure

Areas to revise:	CGP Guide Pages
Developing the Model of the Atom	195
Isotopes and Nuclear Radiation	196
Nuclear Equations	197
Half-life	198
Irradiation and Contamination	199



Physics Paper 2

P5 Forces		
Areas to revise:	**CGP Guide Pages**	
Contact and Non-Contact Forces	201	
Weight, Mass and Gravity	202	
Resultant Forces and Work Done	203	
Calculating Forces..	204	
Forces and Elasticity	205	
Investigating Springs	206	
Distance, Displacement, Speed and Velocity	207	
Acceleration	208	
Distance-Time and Velocity-Time Graphs	209	
Terminal Velocity	210	
Newton's First and Second Laws	211	
Inertia and Newton's Third Law	212	
Investigating Motion	213	
Stopping Distances	214	
Reaction Times	215	
Momentum (H)	216	

P6 Waves		
Areas to revise:	**CGP Guide Pages**	
Transverse and Longitudinal Waves	220	
Experiments With Waves	221	
Wave Behaviour and Electromagnetic Waves	222	
Refraction	223	
Radio Waves(H)	224	
EM Waves and Their Uses	225	
More Uses of EM Waves	226	
Investigating Infrared Radiation	220	
Dangers of Electromagnetic Wave	221	

P7 Magnetism		
Areas to revise:	**CGP Guide Pages**	
Permanent and Induced Magnets	227	
Electromagnetism	228	
The Motor Effect (H)	229	
Electric Motors (H)	230	

Chemistry

Paper 1 (1 hour 15 minutes)

19th May 2025 (AM)

C1: Atomic structure & the periodic table
C2: Bonding
C3: Quantitative Chemistry
C4: Chemical Changes
C5: Energy Changes

Paper 2 (1 hour 15 minutes)

13th June 2025 (AM)

C6: Rates of reaction
C7: Organic chemistry
C8: Chemical analysis
C9: Chemistry of the atmosphere
C10: Energy changes

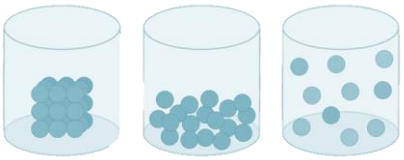
Chemistry Paper 1

C1
Atomic structure & the periodic table

Areas to revise:	CGP Guide Pages
Atoms	96
Elements	97
Compounds	98
Chemical Equations	99
Mixtures and Chromatography	100
More Separation Techniques	101
Distillation	102
The History of the Atom	103
Electronic Structure	104
Development of the Periodic Table	105
The Modern Periodic Table	106
Metals and Non-Metals	107
Group 1 Elements	108
Group 7 Element	109
Group O Element	110

C2
Bonding

Areas to revise:	CGP Guide Pages
Formation of Ions. Ionic Bonding	112
Ionic Bonding	113
Ionic Compounds	114
Covalent Bonding	115
Simple Molecular Substances	116
Polymers and Giant Covalent Structures	117
Allotropes of Carbon. (H)	118
Metallic Bonding	119
States of Matter	120
Changing State	121



C3
Quantitative Chemistry

Areas to revise:	CGP Guide Pages
Relative Formula Mass	123
Conservation of mass	124
Concentrations of solutions	125
The Mole and Equations (H)	126
Limiting Reactants (H)	128

C4
Chemical Changes

Areas to revise:	CGP Guide Pages	
Acids and Bases	129	
Strong Acids and Weak Acid	130	
Reactions of Acids	131	
The Reactivity Series	132	
Separating Metals from Metal Oxides	133	
Redox Reaction(H)	134	
Electrolysis	135	
Electrolysis of Aqueous Solutions	136	

C5
Energy Changes

Areas to revise:	CGP Guide Pages	
Exothermic and Endothermic Reactions	138	
More Exothermic and Endothermic Reactions	139	
Bond Energies (H)	140	

Chemistry Paper 2

C6
Rates of Reaction

Areas to revise:	CGP Guide Pages
Rates of Reaction	142
Factors Affecting Rates of Reaction	143
Measuring Rates of Reaction	144
Two Rates Experiments	145
Finding Reaction Rates from Graphs	146
Reversible Reactions	147
Le Chatelier's Principle(H)	148

C7
Organic Chemistry

Areas to revise:	CGP Guide Pages
Hydrocarbons	150
Fractional Distillation	151
Uses and Cracking of Crude Oil	152

C8
Chemical Analysis

Areas to revise:	CGP Guide Pages
Purity and Formulations	153
Paper Chromatography	154
Tests for Gases	155

C9
Chemistry of the atmosphere

Areas to revise:	CGP Guide Pages
The Evolution of the Atmosphere	157
Greenhouse Gases and Climate Change	158
Carbon Footprints	159
Air Pollution	160

C10
Energy Changes

Areas to revise:	CGP Guide Pages
Finite and Renewable Resources	161
Reuse and Recycling	162
Life Cycle Assessments	163
Potable Water	164
Waste Water Treatment	165

Resource Checklist

- 10-minute tests (CGP)
- CGP Workbooks
- CGP Revision Question Cards
- CGP Guides
- Educake (all topics covered)