

Combined Science Paper 1 HIGHER

Biology

These specification points will be the **major focus** of this paper.

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.1.2 Cell Division	<ul style="list-style-type: none"> -How DNA is arranged as chromosomes -Series of stages in the cell cycles inc. mitosis -Definition and uses of stem cells 	25-29	https://www.bbc.co.uk/bitesize/guides/z2kmk2p/revision/2 https://www.bbc.co.uk/bitesize/guides/z2kmk2p/revision/3	https://www.youtube.com/watch?v=RHyZVmbiA78 https://www.youtube.com/watch?v=Kh27eyjxvYM&t=24s
4.2.2 Animal tissues, organs and organ systems	<ul style="list-style-type: none"> - Functions of tissues and organs in the digestive system -Digestive enzymes -Functions of tissues and organs in the circulatory system -Pathway of blood through the heart -adaptations of components of the blood -risk factors of non-communicable diseases -Explain the cause of CHD -Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant 		https://www.bbc.co.uk/bitesize/guides/z89mk2p/revision/1 https://www.bbc.co.uk/bitesize/guides/zsnscrd/revision/1	https://www.youtube.com/watch?v=4ui4oSHHzA https://www.youtube.com/watch?v=VLK2wANjQm0 https://www.youtube.com/watch?v=bpYaKM2hVfY GCSE Biology - Why Do We Get Heart Disease and How to Treat It? - Cardiovascular Disease (CVD) #20 – YouTube
Required practical 3: test for carbohydrates, lipids and proteins	<ul style="list-style-type: none"> -Reagent and positive result for carbohydrates, proteins and lipids 	29	https://www.bbc.co.uk/bitesize/guides/z89mk2p/revision/3	https://www.youtube.com/watch?v=SqWTJWOBww4

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
Required Practical 4 investigate the effect of pH on the rate of reaction of amylase enzyme.	<ul style="list-style-type: none"> -action of enzymes -describe and explain the effect of extreme pH on rate of enzymes -testing for starch -identify independent, dependent, control variables -How to measure the dependent variable -method -analysing results 	44	Required practical activity - Animal organisation - digestion - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize	GCSE Science Revision Biology "Required Practical 5: Effect of pH on Amylase" – YouTube Enzymes - GCSE Science Required Practical – YouTube
4.4.1 Photosynthesis	<ul style="list-style-type: none"> -photosynthesis equation -factors affecting rate of photosynthesis -explain graphs of photosynthesis rate involving 2/3 factors and decide which is the limiting factor. -understand and use inverse proportion – the inverse square law and light intensity -explain the important of limiting factors in enhancing the conditions in greenhouses to gain the maximum rate of photosynthesis while still maintaining profit. 	89-95	https://www.bbc.co.uk/bitesize/guides/zs4mk2p/revision/1	https://www.youtube.com/watch?v=rAJGnS_ktk4 GCSE Science Revision Biology "Limiting Factors" – YouTube The Rate of Photosynthesis & The Inverse Square Law – YouTube
Required Practical 5: effect of light intensity on rate of photosynthesis	<ul style="list-style-type: none"> -independent, dependent, control variables -How to measure the dependent variable -method -analysing results 	93	https://www.bbc.co.uk/bitesize/guides/zs4mk2p/revision/5	https://www.youtube.com/watch?v=cBCKedXdFeE

These specification points will **not be assessed** on this paper.

Spec point	CGP Revision Guide Pages
4.1.1.5 Microscopy	19
4.1.3 Transport in cells	30-33
4.2.3 Plant tissues, organs and systems	68-72
4.3.1.2 Viral Diseases 4.3.1.4 Fungal Diseases 4.3.1.5 Protist Diseases	77 and top of 78
4.3.1.6 Human Defence Systems	81
4.4.1.3 Uses of Glucose from Photosynthesis	Bottom of P89
4.4.2.2 Response to exercise	101

These areas **may still be assessed** in multiple choice questions/linked to a previous answer, so cannot be completely ignored in your revision.

Content	CGP Revision Guide Pages
Cells, specialisation, microscopy	17-19
Cell organisation	40
Communicable disease	75
Vaccination and antibiotics	82-84
Respiration and Metabolism	98-99

Chemistry

These specification points will be the **major focus** of this paper.

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
5.2.2 How bonding and structure are related to the properties of a substance	<ul style="list-style-type: none"> -interpreting melting and boiling point data to determine state at a certain temp -link energy needed to change state to strength of forces between particles -state symbols -describe & explain properties of ionic compounds -describe & explain properties of simple covalent molecules -describe & explain properties of polymers -describe & explain properties of metals and alloys 	212-214 216-219	https://www.bbc.co.uk/bitesize/topics/z33rrwx	https://www.youtube.com/watch?v=leVxy7cjZMU https://www.youtube.com/watch?v=DECGNyC-x_s https://www.youtube.com/watch?v=EP0zfm_FVqc https://www.youtube.com/watch?v=A-wTpLPICd0
5.3.2 Use of amount of substance in relation to masses of pure substances	<ul style="list-style-type: none"> -calculating relative formula mass -calculating the number of moles in a given mass of a substance, calculating the mass of a certain no. of moles of a substance -Avogadro's constant – the number of particles in 1 mole of every substance -calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product. -using molar ratios to balance equations -identifying limiting reactants and explaining the effect on yield of products -define concentration of a solution -calculate the concentration of a solution, or the mass of a solute dissolved in a given volume to create a solution of given concentration 	223-229	https://www.bbc.co.uk/bitesize/topics/zsnny4j	https://www.youtube.com/watch?v=q49NwlrjaFw https://www.youtube.com/watch?v=wPGVQu3UXpw https://www.youtube.com/watch?v=TV6n5MFH6IU https://www.youtube.com/watch?v=YKvUQ2cPmJg https://www.youtube.com/watch?v=MuzOmFhiE8o https://www.youtube.com/watch?v=3G3KQIyoZDI
5.4.1 The Reactivity of Metals	<ul style="list-style-type: none"> -Metals + oxygen -Reduction and oxidation in terms of oxygen -reduction and oxidation in terms of electrons -identify in a given reaction, symbol equation or half equation which species are oxidised and which are reduced -The Reactivity Series - Displacement reactions - Extraction of metals by reduction 	236-240	https://www.bbc.co.uk/bitesize/guides/zy7dgd/revison/1	https://www.youtube.com/watch?v=Lk1V0buHEFs https://www.youtube.com/watch?v=gnbuTl2aril https://www.youtube.com/watch?v=2i5Lm7BMtpo https://www.youtube.com/watch?v=MXTSels6e2Y
5.4.2 Reactions of Acids	<ul style="list-style-type: none"> -Naming Salts -products of the reactions of acids and metals -explain the reactions of metals and acids in terms of loss and gain of electrons -products of the reactions of acids and alkalis and insoluble bases -products of the reactions of acids and metal carbonates -pH scale and neutralisation -difference between strong and weak acids 	231-234	https://www.bbc.co.uk/bitesize/guides/ztv2dxs/revison/1	https://www.youtube.com/watch?v=ofw6oHSYGF https://www.youtube.com/watch?v=QlSsle_jSQ8 GCSE Science Revision Chemistry "Acids Reacting with Metals 2" - YouTube
5.4.2.3 and Required Practical 8: preparation of a pure, dry sample of soluble salts	<ul style="list-style-type: none"> -method of producing solid salt crystals from insoluble oxide or carbonate and acids -identifying errors in methods and reagents 	234	https://www.bbc.co.uk/bitesize/guides/ztv2dxs/revison/5	https://www.youtube.com/watch?v=9GH95172Js8&t=16s GCSE Science Revision Chemistry "Strong and Weak Acids" – YouTube

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
5.4.3 Electrolysis	<ul style="list-style-type: none"> -The process of electrolysis -identifying oxidation and reduction in terms of electrons -writing half equations for oxidation/reduction reactions occurring at each electrode -Electrolysis of molten ionic compounds -Electrolysis of aluminium oxide -Electrolysis of aqueous solutions, predicting products formed 	241-245	https://www.bbc.co.uk/bitesize/guides/z9h9v9q/revision/1	https://www.youtube.com/watch?v=AhTRiL6xjBA&t=2s https://www.youtube.com/watch?v=iINOpROacf0 https://www.youtube.com/watch?v=YcyMElBEzAY https://www.youtube.com/watch?v=6WjC_Vi4roA https://www.youtube.com/watch?v=W9ngXNxSyoo
Required Practical 9: : investigate what happens when aqueous solutions are electrolysed using inert electrodes.	<ul style="list-style-type: none"> -Developing a hypothesis -Planning an investigation 	245 410	https://www.bbc.co.uk/bitesize/guides/z9h9v9q/revision/3	https://www.youtube.com/watch?v=ukbtTTG1Kew
5.5.1 Exothermic and endothermic reactions	<ul style="list-style-type: none"> -describe the law of the conservation of energy -define exo and endothermic reactions and describe their features -give examples of exo and endothermic reactions -define activation energy -represent exo and endothermic reactions with reaction profiles -describe bond breaking in the reactants as an endothermic process -describe bond formation in the products as an exothermic process -calculate the energy transferred in chemical reactions using bond energies supplied -Use energy change values to identify if a reaction is exo/endothermic 	247-250	https://www.bbc.co.uk/bitesize/guides/z2b2k2p/revision/1	https://www.youtube.com/watch?v=4HS6D0hTzdg https://www.youtube.com/watch?v=dstRL5xB0Sk https://www.youtube.com/watch?v=it0HGxhxD-s https://www.youtube.com/watch?v=eExCBkp4jB4 https://www.youtube.com/watch?v=PdValXAVUOc
Required Practical 10: investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, carbonates, neutralisations, displacement of metals	<ul style="list-style-type: none"> -Identifying independent, dependent, control variables -Analysing results -identifying exo and endothermic reactions from experimental results 	248	https://www.bbc.co.uk/bitesize/guides/z2b2k2p/revision/2	https://www.youtube.com/watch?v=Bz0C9mmF2tw

Physics

Higher paper 1

Higher paper 1		Revision Pages
MAJOR FOCUS		
6.1.1 Energy changes in a system, and the ways energy is stored before and after such changes.	<ul style="list-style-type: none"> The 8 energy stores The 4 energy pathways Changes for the following situations <ul style="list-style-type: none"> An object projected upwards A moving object hitting an obstacle An object accelerated by a constant force A vehicle slowing down Bringing water to a boil in an electric kettle Kinetic energy equation Elastic potential energy equation Gravitational potential energy equation Specific heat capacity Power = $\frac{\text{energy transferred}}{\text{time}}$ Work done Efficiency 	283-286 293-295
6.2.4 Energy Transfers	<ul style="list-style-type: none"> Power = potential difference x current ($P = I \times V$) Power = $\frac{\text{Current}^2}{\text{Resistance}}$ ($P = \frac{I^2}{R}$) Electrical devices are designed to usefully transfer energy Amount of energy transferred depends on power of device and time switched on Energy transferred = power x time ($E = P \times t$) Energy transferred = charge x potential difference ($E = Q \times V$) National Grid – system of cables and transformers linking power stations to customers Step-up transformer – increases p.d. to reduce current – more efficient energy transfer Step-down transformer – reduces p.d. to increase current 	321-324
6.3.1 Changes of state and the particle model	<ul style="list-style-type: none"> Density ($\rho = \frac{m}{V}$) Changes of state (melt, freeze, boil, condense, evaporate, sublimate) as physical change with mass conserved 	328-330
6.3.3 Particle model and pressure	<ul style="list-style-type: none"> Particle model of materials Gas pressure 	326-327
6.4.1 Atoms and isotopes	<ul style="list-style-type: none"> Size and structure of atom, electron energy levels Mass number, atomic number, isotopes Development of the atomic model (Dalton, Thompson plum pudding, Rutherford alpha scattering, Bohr electrons orbits, Chadwick discovery of neutrons) 	334-336
6.4.2 Atoms and nuclear radiation	<ul style="list-style-type: none"> Instability of atomic nuclei Activity as rate of decay of unstable nuclei Geiger-Muller tube as measuring device α, β, γ radiation – properties and make-up (penetrating power, range in air ionising power) Use of radionucleotides in industry and medicine Decay equation of α β Half-life – calculations and graphs Radioactive contamination and irradiation – compare hazards of each 	337-343
Required Practical	<ul style="list-style-type: none"> Specific Heat Capacity I/V Graphs 	289-290 309-310

Low Tariff/Linked Topics		
6.1.2 Conservation and dissipation of energy	<ul style="list-style-type: none"> • Energy can be transferred usefully from store to store, but never created or destroyed. • Energy that dissipates to the surroundings is wasted. • Lubrication/thermal insulation can reduce unwanted energy transfers. • Efficiency = useful energy out/total energy in • Efficiency = useful power out/total power in • Describe how to increase efficiency 	287 294-295
6.1.3 National and global energy resources	<ul style="list-style-type: none"> • Fossil fuels • Renewable/non-renewable methods of generating electricity • Reliability of energy sources • Environmental impacts 	297-303
6.2.1 Current, potential difference and resistance	<ul style="list-style-type: none"> • Circuit symbols • Current as rate of flow of charge • $Q = It$ • Ohm's Law ($V = IR$) • I/V Graphs, LDRs, thermistors • Explain why resistance in parallel decreases total resistance 	305-307 312-313
NOT ON EXAM		
6.2.2 Series and parallel circuits	<p>Components in series</p> <ul style="list-style-type: none"> ○ Same current through each component ○ Total potential difference is shared between components ○ Total resistance is sum of resistances ($R_{Tot} = R_1 + R_2$) ○ Resistance measured in Ohms (Ω) <p>Components in parallel</p> <ul style="list-style-type: none"> ○ Total current is sum of current through each branch ○ Potential difference is the same on each branch ○ Total resistance of two resistors is less than resistance of smallest individual resistor <ul style="list-style-type: none"> • Draw and check series and parallel circuits • Apply Ohm's law to series circuits 	314-318
6.2.3 Domestic uses and safety	<ul style="list-style-type: none"> • AC/DC (alternating current/direct current) • Plugs, cables, fuses, live, neutral, earth • UK main domestic supply – 50 Hz and 230 V. • 	320
6.3.2 Internal energy and energy transfers	<ul style="list-style-type: none"> • Energy is stored in a system by the particles • Internal energy – total of kinetic energy and potential energy of particles in system • Heating increases kinetic energy, therefore increasing internal energy • Change in thermal energy = mass x specific heat capacity x temperature change ($\Delta E = m \times c \times \Delta \theta$) • The specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius. • Energy needed for change of state is called latent heat. • During change of state, internal energy changes but not temperature. • Energy for change of state = mass x specific latent heat ($E = m \times L$) 	330