Year 11 Science GCSE Revision – CHEMISTRY (PAPER 1)

Chemistry only content is the extra work that **separate science** students have studied

All support resources (specimen exam papers, mark schemes, powerpoints, summary sheets, core practicals) can be found on the reference drive at **N:\Reference\Science\NEW AQA GCSE**

Revision should be checked against syllabus content (different for TRIOLOGY and separate CHEMISTRY) at **N:\Reference\Science\NEW AQA GCSE\syllabus content (chemistry)**

Make sure you **revise the required practicals** properly. These are more likely to come up on the examination papers

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Week Beginning	**Topic**	**Key Ideas**	**Topics for possible longer answer responses**
11th March	C1 atomic structure and periodic table	Atoms, elements, mixtures and compounds Development of model of the atom Atomic structure and electron configuration Calculating relative atomic mass, A_r for isotopes Development of periodic table (Mendeleev) Properties of elements in group 0, 1 and 7	Development of periodic table (Mendeleev's improvements) Plum pudding vs nuclear model of the atom (Rutherford's evidence) Explain trend in reactivity of elements in group 1 (or group 7 - opposite trend) *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Properties of transition metals	Properties of transition metals compared to group 1 metals
18th March	C2 structure and bonding	Ionic bonding Covalent bonding, simple molecules and macromolecules like diamond, sand, graphite, graphene and fullerenes Metallic bonding and alloys States of matter (particle theory) and state symbols	Explain (or compare) properties of materials linked to structure and bonding, eg. for sodium chloride (ionic), chlorine (simple covalent molecular), sodium (metallic), diamond, graphite, graphene (macromolecular covalent) etc. Evaluate different methods for modelling structures eg. pros/cons of dot and cross diagrams vs ball and stick for covalent molecules *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Nanoparticles (properties and uses)	Evaluate use of nanoparticles (pros/cons)

25th March	C3 quantitative chemistry	Conservation of mass and balanced equations Relative formula mass, M_r Uncertainty Concentrations in g/dm^3 Remember 1 dm^3 = 1000 cm^3 **Higher Tier** **Moles and molar calculations** **Limiting reactants**	Explain how reactions that appear to involve a change in mass may still observe the conservation of mass rule eg. those where a reactant or product is a gas, and this mass has not been taken into account **Higher Tier – Remember moles = $\frac{\text{mass}}{\text{Mr}}$** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Percentage yield Atom economy Concentrations in mol/dm^3 Calculations involving gas volumes	Remember 1 mole of any gas has a volume of 24 dm^3 (which is also 24,000 cm^3)
1st April	C4 chemical changes	Reactivity series of metals Extraction of metals with carbon Reactions of metals with acids Neutralisation and making salts The pH scale Electrolysis (molten and aqueous compounds) Extracting metals like aluminium using electrolysis **Higher Tier** **Redox reactions in terms of electrons (OILRIG)** **Writing half equations (balancing using electrons)** **Strong and weak acids**	***Required practical - making a soluble salt*** ***Required practical - investigating electrolysis*** Explain why some metals are extracted by heating with carbon, but others must use electrolysis, related to position in reactivity series **Higher Tier** **Compare and explain properties of weak and strong acids, including describing a simple chemical test to tell them apart** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Titrations	***Required practical – titrations***
8th April	C5 energy changes	Exothermic and endothermic reactions Reaction profiles (energy level diagrams) **Higher Tier** **Energy changes for breaking and forming bonds** **Calculating overall change from bond energy values**	***Required practical - investigating temperature change*** Label energy level diagrams to show position of products, overall energy change, activation energy for both exothermic and endothermic reactions **Higher Tier** **Effect of bond strength on overall energy change (compare relative size of bond breaking vs bond forming)** **Bond energy calculations** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Chemical cells and fuel cells	Evaluate use of fuel cells vs rechargeable cells ie. pros/cons

Year 11 Science GCSE Revision – CHEMISTRY (PAPER 2)

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Week Beginning	Topic	Key Ideas	Topics for possible longer answer responses
15th April	C6 rate and extent of chemical change	Calculating mean rate from supplied data or graphs Explaining how concentration, pressure, surface area, temperature and using a catalyst affect rate of reaction using collision theory Activation energy, catalysts and reaction profiles (energy level diagrams) Reversible reactions Equilibrium definition **Higher Tier** **Calculating rate from tangents on graphs** **Le Chatelier's principle and predicting effect of concentration, pressure and temperature on equilibria**	***Required practical - investigating rate of reaction (changing concentration or temp.)*** Explain changes in rate using idea of collision theory (particles/collisions) Label energy level diagrams to show position of products, overall energy change, activation energy for both exothermic and endothermic reactions (similar to C5 as content overlaps) **Higher Tier** **Explain changes in equilibrium position using Le Chatelier's principle, including why compromise conditions are often chosen** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		No extra content	
22nd April	C7 organic chemistry	Crude oil, hydrocarbons and alkanes Fractional distillation of crude oil Properties of hydrocarbons Cracking and alkenes	Explain how fractional distillation and cracking work, and how they supply demand for fuels such as petrol Explain how properties of hydrocarbons such as alkanes vary with chain length *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Alkenes, alcohols and carboxylic acids Synthetic and natural polymers including addition polymers, condensation polymers, amino acids and DNA	Compare addition vs condensation polymerisation commenting on similarities and differences Compare and explain properties of weak and strong acids, including describing a simple chemical test to tell them apart (similar to C4 since carboxylic acids are weak acids)

29th April	C8 chemical analysis	Purity and formulations Chromatography Calculating R_f values Identifying common gases, hydrogen, oxygen, carbon dioxide and chlorine	***Required practical – chromatography*** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Flame tests and flame emission spectroscopy Identifying metal ions in solution from metal hydroxides Identifying carbonates, halides and sulfates	***Required practical - identifying ions*** Evaluate methods for identifying metal ions, eg. pros and cons of flame tests vs spectroscopy
6th May	C9 chemistry of the atmosphere	% of gases in current atmosphere Evolution of the atmosphere, early composition of gases, importance of green plant evolution Global warming and carbon dioxide, CO_2, and methane, CH_4, as greenhouse gases Carbon footprint Atmospheric pollutants, sources and their effects	Describe and explain how the early atmosphere changed to gives us the % of gases in our current atmosphere Explain why CO_2 and methane, CH_4, levels are increasing, actions to reduce emissions and describe the effects of global warming Describe fully the differences between complete and incomplete combustion of hydrocarbon fuels *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		No extra content	
13th May	C10 using resources	Finite and renewable resources Potable water and waste water treatment Life cycle assessments and recycling **Higher Tier** **Copper ores and alternative extraction methods**	***Required practical - purifying water*** Carry out simple comparative life cycle assessments eg. for shopping bags made from plastic or paper **Higher Tier** **Evaluate pros/cons of phytomining and bioleaching vs traditional methods of metal extraction** *Use specimen papers and summary sheets on the reference drive for more ideas*
Chemistry only content		Corrosion and prevention Alloys, ceramics, polymers and composites The Haber process and production of NPK fertilisers	Compare properties of materials such as alloys, composites, polymers, ceramics and glass from supplied data to make recommendations about suitability Explain, using Le Chatelier's principle, the ideal conditions required in the Haber Process (temperature, pressure, catalyst) including why compromise conditions are often chosen