AQA GCSE Chemistry Paper 1 checklist

This checklist goes with Medly's guide "AQA GCSE Chemistry Paper 1: every topic, the required practicals, marks and timing for 2027". It lists every Paper 1 sub-topic of AQA GCSE Chemistry (8462), which Combined Science: Trilogy (8464) shares except for the rows marked GCSE Chemistry only. The labels are AQA's: Higher tier only means "(HT only)" and GCSE Chemistry only means "(chemistry only)". Part means AQA labels only part of the sub-topic: the notes under each table say which part. Foundation tier papers do not test these parts. Trilogy papers do not test the rows marked GCSE Chemistry only.

Topic 1: Atomic structure and the periodic table

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.1.1.1 Atoms, elements and compounds	Part	No	☐
4.1.1.2 Mixtures	No	No	☐
4.1.1.3 The development of the model of the atom	No	No	☐
4.1.1.4 Relative electrical charges of subatomic particles	No	No	☐
4.1.1.5 Size and mass of atoms	No	No	☐
4.1.1.6 Relative atomic mass	No	No	☐
4.1.1.7 Electronic structure	No	No	☐
4.1.2.1 The periodic table	No	No	☐
4.1.2.2 Development of the periodic table	No	No	☐
4.1.2.3 Metals and non-metals	No	No	☐
4.1.2.4 Group 0	No	No	☐
4.1.2.5 Group 1	No	No	☐
4.1.2.6 Group 7	No	No	☐
4.1.3.1 Comparison with Group 1 elements	No	Yes	☐
4.1.3.2 Typical properties	No	Yes	☐

4.1.1.1: the Higher tier only part is writing balanced half equations and ionic equations where appropriate.

Topic 2: Bonding, structure, and the properties of matter

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.2.1.1 Chemical bonds	No	No	☐
4.2.1.2 Ionic bonding	No	No	☐

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.2.1.3 Ionic compounds	No	No	☐
4.2.1.4 Covalent bonding	No	No	☐
4.2.1.5 Metallic bonding	No	No	☐
4.2.2.1 The three states of matter	Part	No	☐
4.2.2.2 State symbols	No	No	☐
4.2.2.3 Properties of ionic compounds	No	No	☐
4.2.2.4 Properties of small molecules	No	No	☐
4.2.2.5 Polymers	No	No	☐
4.2.2.6 Giant covalent structures	No	No	☐
4.2.2.7 Properties of metals and alloys	No	No	☐
4.2.2.8 Metals as conductors	No	No	☐
4.2.3.1 Diamond	No	No	☐
4.2.3.2 Graphite	No	No	☐
4.2.3.3 Graphene and fullerenes	No	No	☐
4.2.4.1 Sizes of particles and their properties	No	Yes	☐
4.2.4.2 Uses of nanoparticles	No	Yes	☐

4.2.2.1: the Higher tier only parts are the limitations of the simple particle model (in the model there are no forces, all particles are represented as spheres, and the spheres are solid), and explaining those limitations in relation to changes of state when particles are represented by solid inelastic spheres with no forces between them.

Topic 3: Quantitative chemistry

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.3.1.1 Conservation of mass and balanced chemical equations	No	No	☐
4.3.1.2 Relative formula mass	No	No	☐
4.3.1.3 Mass changes when a reactant or product is a gas	No	No	☐
4.3.1.4 Chemical measurements	No	No	☐
4.3.2.1 Moles	Yes	No	☐
4.3.2.2 Amounts of substances in equations	Yes	No	☐
4.3.2.3 Using moles to balance equations	Yes	No	☐
4.3.2.4 Limiting reactants	Yes	No	☐

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.3.2.5 Concentration of solutions	Part	No	☐
4.3.3.1 Percentage yield	Part	Yes	☐
4.3.3.2 Atom economy	Part	Yes	☐
4.3.4 Using concentrations of solutions in mol/dm³	Yes	Yes	☐
4.3.5 Use of amount of substance in relation to volumes of gases	Yes	Yes	☐

4.3.2.5: the Higher tier only part is explaining how the mass of a solute and the volume of a solution are related to the concentration of the solution.

4.3.3.1: the Higher tier only part is calculating the theoretical mass of a product from a given mass of reactant and the balanced equation.

4.3.3.2: the Higher tier only part is explaining why a particular reaction pathway is chosen, given data such as atom economy (if not calculated), yield, rate, equilibrium position and usefulness of by-products.

Topic 4: Chemical changes

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.4.1.1 Metal oxides	No	No	☐
4.4.1.2 The reactivity series	No	No	☐
4.4.1.3 Extraction of metals and reduction	No	No	☐
4.4.1.4 Oxidation and reduction in terms of electrons	Yes	No	☐
4.4.2.1 Reactions of acids with metals	Part	No	☐
4.4.2.2 Neutralisation of acids and salt production	No	No	☐
4.4.2.3 Soluble salts (required practical 1)	No	No	☐
4.4.2.4 The pH scale and neutralisation	No	No	☐
4.4.2.5 Titrations (required practical 2)	Part	Yes	☐
4.4.2.6 Strong and weak acids	Yes	No	☐
4.4.3.1 The process of electrolysis	Part	No	☐
4.4.3.2 Electrolysis of molten ionic compounds	No	No	☐
4.4.3.3 Using electrolysis to extract metals	No	No	☐
4.4.3.4 Electrolysis of aqueous solutions (required practical 3)	No	No	☐
4.4.3.5 Representation of reactions at electrodes as half equations	Yes	No	☐

4.4.2.1: the Higher tier only part is explaining, in terms of gain or loss of electrons, that the reactions of acids with metals are redox reactions, and identifying which species are oxidised and which are reduced. The limit to magnesium, zinc and iron with hydrochloric and sulfuric acids applies to both tiers.

4.4.2.5: the Higher tier only parts are calculating chemical quantities in titrations involving concentrations in mol/dm³ and g/dm³, and the second half of required practical 2 (the concentration of one solution from the reacting volumes and the other's known concentration).

4.4.3.1: the Higher tier only part is writing half equations for the reactions at the electrodes throughout electrolysis, including completing and balancing given half equations.

Topic 5: Energy changes

Sub-topic	Higher tier only	GCSE Chemistry only	Done
4.5.1.1 Energy transfer during exothermic and endothermic reactions (required practical 4)	No	No	☐
4.5.1.2 Reaction profiles	No	No	☐
4.5.1.3 The energy change of reactions	Yes	No	☐
4.5.2.1 Cells and batteries	No	Yes	☐
4.5.2.2 Fuel cells	Part	Yes	☐

4.5.2.2: the Higher tier only part is writing the half equations for the electrode reactions in the hydrogen fuel cell.

Required practicals on Paper 1

Required practical	Sub-topic	GCSE Chemistry	Trilogy	Done
Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate	4.4.2.3	1	8	☐
Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration	4.4.2.5	2 (GCSE Chemistry only)	Not in Trilogy	☐
Investigate what happens when aqueous solutions are electrolysed using inert electrodes	4.4.3.4	3	9	☐
Investigate the variables that affect temperature changes in reacting solutions	4.5.1.1	4	10	☐

The second half of required practical 2, working out a concentration from the titration results, is Higher tier only.