GCSE Chemistry Revision Guide

Combined Science & Triple Award

GCSE Chemistry sits on three pillars — atomic structure, bonding, and quantitative chemistry — and almost every later topic is a variation on these ideas applied to a new context, so a shaky foundation here costs marks across the whole paper. Start by being completely secure on the structure of the atom, the arrangement of the periodic table by electron configuration, and the three types of bonding (ionic, covalent, metallic), including how each bonding type explains a substance's physical properties such as melting point and conductivity.

Quantitative chemistry is where most marks are lost, not because the ideas are hard but because the arithmetic and units trip students up. Moles, relative formula mass, percentage yield, and concentration calculations all follow set formulae — the key skill is correctly identifying which formula a question needs and substituting the right numbers with the right units, then checking the answer is a sensible size. Triple Award students also need titration calculations and the ideal gas equation.

Chemical changes covers reactivity, extraction of metals, acids and bases, electrolysis, and the pH scale — a topic best learned through practical logic (why does a more reactive metal displace a less reactive one?) rather than pure memorisation. Energy changes introduces exothermic and endothermic reactions, bond energy calculations, and reaction profiles, which examiners frequently combine with a required practical on measuring temperature change.

Rates of reaction and equilibrium test whether you understand collision theory well enough to explain, not just describe, why increasing concentration, temperature, surface area or pressure changes a rate — "explain" answers need a mechanism, not a restatement of the observation. Organic chemistry (hydrocarbons, cracking, polymers) and chemical analysis (chromatography, tests for gases and ions) round out the course, and Triple students add Earth's atmosphere and resources. Because Chemistry has six required practicals per tier, expect at least one exam question per paper based directly on practical method, sources of error, or how to improve accuracy — these are free marks if you've actually thought through the practicals rather than just watched them.

Topics that come up most

- Moles & quantitative calculations
- Atomic structure & the periodic table
- Bonding & structure (ionic/covalent/metallic)
- Rates of reaction & collision theory
- Electrolysis & extraction of metals
- Required practicals & method evaluation
- Organic chemistry & polymers

Exam technique

For calculation questions, always write the formula first, then substitute, then solve — partial credit is awarded at each stage. For "explain" questions, use collision theory or particle-level reasoning explicitly, not just "it reacts faster".

Common mistakes

Confusing mass number and atomic number, forgetting to balance equations, mixing up rate of reaction with amount of product, and giving vague practical answers like "make it more accurate" without saying how.