

GCSE Chemistry Knowledge Checklist

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For each topic, rate your understanding:

✅ Secure | ⚠️ Partial | 🖐️ Insecure | ❌ Not Taught yet

All topics for all tiers are included.

Separate Science (Triple) topics are labelled.

Completing this checklist will help you to know where your strengths and weaknesses lie and help me to assess your needs and personalise your tuition sessions.

1. Atomic Structure and the Periodic Table

- ☐ Structure of atoms, elements, and compounds
- ☐ Atomic number, mass number, and isotopes
- ☐ Development of the atomic model
- ☐ Development of the periodic table
- ☐ The periodic table and trends in groups and periods
- ☐ Properties and reactions of Group 1, Group 7, and Group 0 elements
- ☐ Properties of the transition metals (CHEMISTRY ONLY)

2. Bonding, Structure, and the Properties of Matter

- ☐ Ionic bonding and structures
- ☐ Covalent bonding and molecules
- ☐ Metallic bonding and properties of metals
- ☐ Properties of solids, liquids, and gases
- ☐ Giant covalent structures and polymers
- ☐ Structure and bonding of carbon
- ☐ Nanoparticles and their uses (CHEMISTRY ONLY)

3. Quantitative Chemistry

- ☐ Conservation of mass and balanced equations
- ☐ Relative formula mass (M_r) and moles
- ☐ Reacting masses and limiting reactants
- ☐ Concentration and volume of solutions
- ☐ Atom economy and percentage yield (CHEMISTRY ONLY)
- ☐ Volumes of gases (CHEMISTRY ONLY)

4. Chemical Changes

- ☐ Metal oxides, reactivity series and displacement reactions
- ☐ Extraction of metals
- ☐ Acids and alkalis (pH, indicators, neutralisation)
- ☐ Making salts
- ☐ Titrations (CHEMISTRY ONLY)
- ☐ Strong and weak acids (CHEMISTRY ONLY)
- ☐ Electrolysis and ionic half equations

5. Energy Changes

- ☐ Exothermic and endothermic reactions
- ☐ Reaction profiles and activation energy
- ☐ Calculating energy changes using bond energies
- ☐ Cells and batteries (CHEMISTRY ONLY)
- ☐ Fuel cells (CHEMISTRY ONLY)

6. The Rate and Extent of Chemical Change

- ☐ Factors affecting rates of reaction
- ☐ Collision theory and catalysts
- ☐ Reversible reactions and dynamic equilibrium
- ☐ Le Chatelier's Principle

7. Organic Chemistry

- ☐ Crude oil, hydrocarbons, and fractional distillation
- ☐ Alkanes and alkenes
- ☐ Combustion and cracking
- ☐ Reactions of alkenes and alcohols (CHEMISTRY ONLY)
- ☐ Reactions of carboxylic acids and esters (CHEMISTRY ONLY)
- ☐ Synthetic and naturally occurring polymers (CHEMISTRY ONLY)

8. Chemical Analysis

- ☐ Pure substances and formulations
- ☐ Chromatography (paper and R_f values)
- ☐ Tests for gases (hydrogen, oxygen, CO₂, chlorine)
- ☐ Flame tests and tests for ions (CHEMISTRY ONLY)
- ☐ Instrument methods (CHEMISTRY ONLY)

9. Chemistry of the Atmosphere

- ☐ Evolution of Earth's atmosphere
- ☐ Greenhouse gases and climate change
- ☐ Pollutants from combustion and their effects

10. Using Resources

- ☐ Finite and renewable resources
- ☐ Potable water and water treatment
- ☐ Life cycle assessments
- ☐ Recycling and sustainable development
- ☐ Rusting and alloys (CHEMISTRY ONLY)
- ☐ Ceramics, polymers, and composites (CHEMISTRY ONLY)
- ☐ The Haber process and NPK fertilisers (CHEMISTRY ONLY)

11. Required Practical Skills

- ☐ Planning and conducting chemistry practicals
- ☐ Accurate measurements and calculations
- ☐ Drawing and interpreting graphs
- ☐ Evaluating results and improving methods



*Hickling
Hacks*