

AS LEVEL CHEMISTRY (9701)

16 WEEK COMPREHENSIVE TEACHING PLAN

Target: Papers 1, 2, 3 (Full AS Level) | **Duration:** 16 weeks

Weekly Structure: 5 theory lessons + 1 practical/analysis session

TOPIC WEIGHTINGS & TIME ALLOCATION

Topic Area	Approx. Weighting	Weeks Allocated	Key Focus
Physical Chemistry	40-45%	7 weeks	Atomic structure, bonding, energetics, kinetics, equilibrium
Inorganic Chemistry	25-30%	4 weeks	Periodic table, groups 2 & 7, periodicity
Organic Chemistry	35-40%	5 weeks	Introduction to organic, hydrocarbons, halogens, oxygen compounds
Practical Skills	Integrated	Weekly	Paper 3 preparation, qualitative analysis
Revision & Exams	-	3 weeks	Full syllabus integration, exam technique

DETAILED 16-WEEK BREAKDOWN

WEEK 1-2: ATOMIC STRUCTURE & THE MOLE

Week 1: Fundamental Particles & Mass Spectrometry

- Day 1: Structure of atom - protons, neutrons, electrons, isotopes
- Day 2: Mass spectrometry - principles, interpreting mass spectra
- Day 3: Relative atomic mass, relative molecular mass calculations
- Day 4: The mole concept, Avogadro's constant
- Day 5: **Past Paper Practice:** Basic atomic structure questions

Practical Day 6: Using mass spectra data to identify elements

Week 2: Quantitative Chemistry

- Day 1: Empirical & molecular formula calculations
- Day 2: Percentage composition, percentage purity
- Day 3: Reacting masses, limiting reagents
- Day 4: Solutions - concentration (g/dm^3 , mol/dm^3), dilution
- Day 5: **Past Paper Practice:** Stoichiometry calculations

Practical Day 6: Preparation of standard solutions

WEEK 3-4: CHEMICAL BONDING & STRUCTURE

Week 3: Ionic & Covalent Bonding

- Day 1: Ionic bonding - formation, properties, lattice structures
- Day 2: Covalent bonding - dot-and-cross diagrams, dative bonds
- Day 3: Shapes of molecules - VSEPR theory (linear to octahedral)
- Day 4: Bond polarity, electronegativity trends
- Day 5: **Past Paper Practice:** Bonding & structure questions

Practical Day 6: Investigating properties of ionic vs covalent compounds

Week 4: Intermolecular Forces & States of Matter

- Day 1: London forces, permanent dipole-dipole interactions
- Day 2: Hydrogen bonding - properties, effects on physical properties
- Day 3: States of matter, changes of state, energy changes
- Day 4: Bonding & properties summary - melting/boiling points, conductivity
- Day 5: **Past Paper Practice:** Intermolecular forces questions

Paper 3 Skills Day 6: Determining melting points, purity tests

WEEK 5-6: ENERGETICS

Week 5: Enthalpy Changes & Calorimetry

- Day 1: Exothermic & endothermic reactions, enthalpy profiles
- Day 2: Standard enthalpy changes (ΔH^f , ΔH^c , ΔH^m)
- Day 3: Calorimetry - calculations, experimental techniques
- Day 4: Hess's Law - introduction, simple cycles
- Day 5: **Past Paper Practice:** Calorimetry calculations

Practical Day 6: Determining enthalpy change of combustion

Week 6: Bond Energies & Advanced Hess's Law

- Day 1: Bond breaking & making, mean bond enthalpy
- Day 2: Hess's Law cycles - formation, combustion, solution
- Day 3: Enthalpy of hydration, lattice energy (introduction)
- Day 4: Error analysis in calorimetry experiments
- Day 5: **Past Paper Practice:** Bond energy & Hess's Law calculations

Practical Day 6: Determining enthalpy change of neutralization

WEEK 7: KINETICS

Week 7: Rates of Reaction

- Day 1: Collision theory, activation energy
- Day 2: Factors affecting rate - concentration, pressure, surface area
- Day 3: Temperature effect, Maxwell-Boltzmann distribution
- Day 4: Catalysts - homogeneous vs heterogeneous, enzymes
- Day 5: **Past Paper Practice:** Kinetics questions

Practical Day 6: Investigating factors affecting reaction rate

WEEK 8: CHEMICAL EQUILIBRIUM

Week 8: Reversible Reactions & Equilibrium

- Day 1: Dynamic equilibrium, characteristics
- Day 2: Equilibrium constant K_c , calculations
- Day 3: Le Chatelier's principle - concentration, temperature, pressure
- Day 4: Industrial applications - Haber process, Contact process
- Day 5: **Past Paper Practice:** Equilibrium calculations

Practical Day 6: Investigating equilibrium systems

WEEK 9-10: INORGANIC CHEMISTRY

Week 9: Periodicity

- Day 1: Periodic table structure, periodic trends (atomic radius)
- Day 2: Ionization energy trends, explanations
- Day 3: Electronegativity, melting points trends
- Day 4: Period 3 elements - oxides, chlorides, reactions
- Day 5: **Past Paper Practice:** Periodicity questions

Practical Day 6: Reactivity of Period 3 elements

Week 10: Group 2 & Group 7

- Day 1: Group 2 - trends in physical & chemical properties
- Day 2: Group 2 reactions with water, oxygen, acids
- Day 3: Group 7 - physical properties, reactivity trends
- Day 4: Halogen displacement reactions, redox aspects
- Day 5: **Past Paper Practice:** Group chemistry questions

Paper 3 Skills Day 6: Qualitative analysis of Group 2 & 7 compounds

WEEK 11-13: ORGANIC CHEMISTRY

Week 11: Introduction to Organic Chemistry

- Day 1: Formulae types (molecular, structural, displayed)
- Day 2: Functional groups, homologous series
- Day 3: IUPAC nomenclature - systematic naming
- Day 4: Structural isomerism - chain, position, functional group
- Day 5: **Past Paper Practice:** Naming & isomerism questions

Practical Day 6: Simple distillation & purification techniques

Week 12: Hydrocarbons & Mechanisms

- Day 1: Alkanes - properties, combustion, cracking
- Day 2: Free radical substitution - mechanism in detail
- Day 3: Alkenes - structure, electrophilic addition mechanism
- Day 4: Polymers - addition polymerization, environmental issues
- Day 5: **Past Paper Practice:** Mechanism questions

Practical Day 6: Testing for unsaturation, polymer preparation

Week 13: Halogenoalkanes, Alcohols & Carbonyls

- Day 1: Halogenoalkanes - nucleophilic substitution mechanisms
- Day 2: Elimination reactions, reaction conditions
- Day 3: Alcohols - classification, oxidation, reactions
- Day 4: Aldehydes & ketones - preparation, oxidation tests
- Day 5: **Past Paper Practice:** Organic reactions questions

Practical Day 6: Oxidation of alcohols, preparation of carbonyls

WEEK 14: CARBOXYLIC ACIDS & ANALYTICAL TECHNIQUES

Week 14: Organic Analysis

- Day 1: Carboxylic acids - properties, reactions
- Day 2: Esters - formation, hydrolysis, uses
- Day 3: Infrared spectroscopy - principles, interpretation
- Day 4: Mass spectrometry in organic chemistry
- Day 5: **Past Paper Practice:** Spectroscopy questions

Practical Day 6: Ester preparation, IR spectrum analysis

WEEK 15-16: REVISION & FINAL PREPARATION

Week 15: Intensive Topic Revision

- Day 1: Physical Chemistry revision - calculations focus
- Day 2: Inorganic Chemistry revision - trends & reactions
- Day 3: Organic Chemistry revision - mechanisms & synthesis
- Day 4: **Mock Paper 1** (MCQ) + detailed review
- Day 5: **Mock Paper 2** (Structured) + mark scheme analysis

Day 6: Mock Paper 3 (Practical) + evaluation

Week 16: Exam Technique & Final Practice

- Day 1: Command words workshop & time management
- Day 2: Calculation intensive - all types practice
- Day 3: Mechanism drawing & organic synthesis practice
- Day 4: Qualitative analysis - all tests revision
- Day 5: **Final Full AS Mock Exam** (all papers)

Day 6: Error analysis, final tips, confidence building

AS LEVEL ASSESSMENT SCHEDULE

Week	Assessment Type	Focus Area	Duration
4	Bonding Test	Ionic, covalent, intermolecular	1 hour
6	Energetics Test	Calorimetry, Hess's Law	1 hour
8	Kinetics & Equilibrium Test	Rates, Kc, Le Chatelier	1 hour
10	Inorganic Test	Periodicity, Groups 2 & 7	1 hour
13	Organic Test	Mechanisms, reactions	1.5 hours
15	Full AS Mock	Papers 1, 2, 3	4.5 hours
16	Final Mock	Exam conditions	Full papers

PRACTICAL SKILLS PROGRESSION

Paper 3 Focus Areas by Term:

- Weeks 1-5: Basic techniques (titration, filtration, distillation)
- Weeks 6-10: Quantitative analysis (calorimetry, rates)
- Weeks 11-16: Qualitative analysis & organic techniques

Required Practicals Coverage:

1. Titration techniques (acid-base, redox)
2. Calorimetry experiments
3. Rates of reaction investigations
4. Qualitative analysis of ions
5. Organic preparation & purification
6. Tests for organic functional groups