Beths Grammar School

KS4 Curriculum Map - Year 9 Chemistry | Academic Year 2026-2027 | OCR GCSE Chemistry A J248

Curriculum intent. Year 9 establishes the conceptual foundations for GCSE Chemistry through one Chemistry lesson every two weeks. Students complete C1 and C2.1-C2.2 before the end-of-Year 9 examination. The examination covers C1.1 to C2.2 inclusive only. C2.3 is taught after the examination. The sequence revisits KS3 knowledge, addresses misconceptions, develops practical and mathematical competence and prepares students for Years 10-11 and OCR A Level Chemistry A H432.

Timetable and examination basis. Year 9 receives three GCSE science lessons per fortnight, one per subject. Chemistry is the yellow-coded allocation in the attached timetable. Week A is odd and starts the school year; Week B is even; holidays do not advance the cycle. One Chemistry allocation is reserved for the end-of-Year 9 examination. C2.3 begins only after that examination.

Period	Core content	Builds on	Leads to	Principal checkpoint
Autumn 1	C1.1 Particle model	Year 7 particles	Atomic structure and bonding	Entry diagnostic; explanation task
Autumn 1-Autumn 2	C1.2 Atomic structure	KS3 atoms and evidence	Ions, periodicity and bonding	C1 practice test, official test, then combined DIRT/reteaching/transfer
Autumn 2-Spring 1	C2.1 Purity and separation	Year 8 mixtures	Analysis and practical methods	Practical and Rf checkpoint
Spring 1	C2.1 Quantitative foundations	Formulae and ratio	Moles and stoichiometry	Fluency and empirical-formula checkpoints
Spring 2-Summer 1	C2.2 Bonding	Electron arrangement	Properties and electrolysis	C1 and C2.2 practice test and official test before end-of-Year 9 examination
Summer 2, after the end-of-Year 9 examination	C2.3 Properties of materials	Bonding and particles	C3, C5 and post-16 chemistry	Post-examination formative and synoptic tasks

Teaching, Inclusion and Assessment Principles

1. Begin with retrieval of relevant prior knowledge.

2. Present new material in small steps and move from I do to We do to You do.

3. Use cold calling, mini whiteboards, hinge questions, practical observation and quizzes to adapt teaching.

4. Maintain the same ambitious curriculum for all students; use vocabulary support, chunking, dual coding, guided practice and additional rehearsal where needed.

5. Teach scientific reading, precise vocabulary, mathematical fluency and extended explanation explicitly.

6. Use purposeful homework to consolidate, prepare or extend learning.

7. Provide whole-class feedback, DIRT, responsive reteaching and a transfer check within the same lesson after each official test.

1. C1.1 The Particle Model

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Autumn Term 1 | Weeks 1-5	**Substantive knowledge** **1.** States of matter and changes of state through particle arrangement, motion and energy. **2.** Physical and chemical change; density; diffusion; limitations of the inelastic-sphere model. **Why this now?** **1.** Reactivates Year 7 particle knowledge. **2.** Establishes the explanatory model required for atomic structure, bonding, energetics and rates. **Explicit OCR A Level Chemistry A links** **1.** H432 2.2.2 Bonding and structure: particle explanations develop into structure, intermolecular forces and macroscopic properties. **2.** H432 3.2.1 Enthalpy changes and 3.2.2 Reaction rates: motion, energy and collisions become quantitative explanations. **3.** H432 5.2.2 Enthalpy and entropy: states and particle distribution support thermodynamic reasoning.	**Curriculum enactment** **1.** Retrieve Year 7 learning and diagnose continuous-matter misconceptions. **2.** Model particle diagrams and explanations before guided and independent application. **3.** Develop observation, variable identification, tabulation and evidence-based conclusions. **Priority misconceptions and planned fixes** **1.** Particles expand when heated -> keep particle size fixed and alter spacing and motion. **2.** Gaps in gases are filled -> use compression evidence and model empty space. **3.** Changes of state are chemical -> compare reversibility and unchanged particle identity. **4.** Density means heaviness -> relate mass per unit volume to particle arrangement. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice before independent application. **4.** Preserve the intended curriculum outcome for all students.	**Students will know and be able to** **1.** States of matter and changes of state through particle arrangement, motion and energy. **2.** Physical and chemical change; density; diffusion; limitations of the inelastic-sphere model. **Assessment checkpoints** **1.** Entry diagnostic in September. **2.** Weekly cumulative retrieval. **3.** Hinge questions after states and changes of state. **4.** End-unit written explanation. **5.** C1 questions revisited in the November practice assessment. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

2. C1.2 Atomic Structure

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Autumn Term 2 | Weeks 6-14	**Substantive knowledge** **1.** Development of atomic models: Dalton, Thomson, Rutherford, Geiger-Marsden and Bohr. **2.** Protons, neutrons and electrons; atomic number; mass number; isotopes; ions; atomic scale. **Why this now?** **1.** Follows the particle model. **2.** Provides the mechanism required to explain periodicity, ion formation and bonding. **Explicit OCR A Level Chemistry A links** **1.** H432 2.1.1 Atomic structure and isotopes: direct progression from protons, neutrons, electrons, ions and isotopes. **2.** H432 2.2.1 Electron structure: GCSE shells develop into sub-shells, orbitals and electron configurations. **3.** H432 3.1.1 Periodicity: atomic number and electron configuration underpin ionisation energy and periodic trends. **4.** H432 2.1.1(d) and 4.2.4: isotopic abundance and relative atomic mass develop into mass spectrometry.	**Curriculum enactment** **1.** Connect each model change to evidence and limitations. **2.** Model nuclide notation and subatomic calculations in small steps. **3.** Use the periodic table to connect proton number, identity and electron arrangement. **Priority misconceptions and planned fixes** **1.** Neutral atoms have equal protons and neutrons -> compare several isotopes. **2.** Positive ions gain protons -> model electron loss while fixing the nucleus. **3.** Isotopes are different elements -> anchor element identity to proton number. **4.** Scientific models are facts -> identify evidence, utility and limitations. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice before independent application. **4.** Preserve the intended curriculum outcome for all students.	**Students will know and be able to** **1.** Development of atomic models: Dalton, Thomson, Rutherford, Geiger-Marsden and Bohr. **2.** Protons, neutrons and electrons; atomic number; mass number; isotopes; ions; atomic scale. **Assessment checkpoints** **1.** Calculation checkpoint on atoms, ions and isotopes. **2.** Evidence-and-model explanation. 3. October C1 practice test and booklet check. 4. Official C1 test in the 16-27 November 2026 window. 5. Combined DIRT, responsive reteaching and transfer check in the first Chemistry lesson after the official test. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

3. C2.1 Purity and Separating Mixtures

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Spring Term 1 | Weeks 15-20	**Substantive knowledge** **1.** Scientific purity; melting-point evidence; formulations and mixtures. **2.** Filtration, crystallisation, simple and fractional distillation, chromatography, mobile and stationary phases, and Rf. **Why this now?** **1.** Revisits Year 8 separation techniques at greater conceptual and practical depth. **2.** Prepares students for chemical analysis and synthesis. **Explicit OCR A Level Chemistry A links** **1.** H432 Module 1.1: planning, implementing, analysis and evaluation. **2.** H432 1.2.2(d), (g), (h) and (i): distillation, filtration, recrystallisation, melting point and chromatography. **3.** H432 4.2.3 and 6.2.5: separation and purification in organic synthesis. **4.** H432 6.3.1: Rf values progress into TLC, gas chromatography and qualitative analysis.	**Curriculum enactment** **1.** Model apparatus, method selection and risk awareness. **2.** Complete chromatography and distillation practical work with accurate records. **3.** Use the plan-record-analyse-evaluate cycle and justify methods from physical properties. **Priority misconceptions and planned fixes** **1.** Pure means natural or safe -> compare scientific and everyday meanings. **2.** Dissolved substances disappear -> recover the solute by evaporation or crystallisation. **3.** Filtration separates solutions -> match method to particle size and physical property. **4.** A chromatogram proves identity -> require reference evidence and controlled conditions. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice before independent application. **4.** Preserve the intended curriculum outcome for all students.	**Students will know and be able to** **1.** Scientific purity; melting-point evidence; formulations and mixtures. **2.** Filtration, crystallisation, simple and fractional distillation, chromatography, mobile and stationary phases, and Rf. **Assessment checkpoints** **1.** Prior-knowledge quiz. **2.** Practical competency checks for apparatus, observation and safety. **3.** Rf calculation checkpoint. **4.** Method-selection task. **5.** Practical record review and cumulative C1 retrieval. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

4. C2.1 Quantitative Foundations

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Spring Term 2 | Weeks 21-25	**Substantive knowledge** **1.** Relative atomic, molecular and formula mass.	**Curriculum enactment** **1.** Use models and worked examples to connect	**Students will know and be able to** **1.** Relative atomic, molecular and formula mass.

TERM	INTENT	IMPLEMENTATION	IMPACT
	2. Formulae, empirical formula, ratios, arithmetic, significant figures and equation rearrangement. **Why this now?** **1.** Students can now connect atoms, ions and compounds with symbolic composition. **2.** Prepares for equations, moles and stoichiometry in later GCSE Chemistry. **Explicit OCR A Level Chemistry A links** **1.** H432 2.1.1 Relative mass and 2.1.2 Compounds, formulae and equations. **2.** H432 2.1.3 Amount of substance: empirical and molecular formulae, moles, gas volumes, concentrations and stoichiometry. **3.** H432 Mathematical requirements M0.0-M2.4: units, standard form, ratio, significant figures and algebra.	microscopic and symbolic representations. **2.** Fade scaffolds from guided examples to independent unfamiliar questions. **3.** Interleave atomic structure, formulae and separation knowledge. **Priority misconceptions and planned fixes** **1.** Subscripts can be changed to balance equations -> distinguish identity from amount. **2.** Relative formula mass has units -> reinforce that it is a relative scale. **3.** Empirical formula equals molecular formula -> compare simplest ratio with actual composition. **4.** Chemical ratio is additive -> model multiplicative relationships. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice before independent application. **4.** Preserve the intended curriculum outcome for all students.	**2.** Formulae, empirical formula, ratios, arithmetic, significant figures and equation rearrangement. **Assessment checkpoints** **1.** Ar and Mr fluency check. **2.** Independent empirical-formula task. 3. Fluency and empirical-formula checkpoints; no separate formal C1-C2.1 assessment. 4. Responsive feedback within normal teaching and retrieval. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

5. C2.2 Bonding

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Summer Term 1 | Weeks 27-31	**Substantive knowledge** **1.** Metals and non-metals; electron arrangement and periodic position. **2.** Ionic, covalent and metallic bonding; dot-and-cross diagrams; simple molecules; giant structures; model limitations. **Why this now?** **1.** Draws directly on atomic structure and periodic position. **2.** Provides prerequisite knowledge for properties, reactions and electrolysis. **Explicit OCR A Level Chemistry A links** **1.** H432 2.2.1 Electron structure: shells are refined into orbital and sub-shell notation. **2.** H432 2.2.2 Bonding and structure: ionic and covalent bonding, molecular shape, polarity and intermolecular forces. **3.** H432 3.1.1 Periodicity: metallic and giant covalent structures explain trends in properties. **4.** H432 5.2.1 Lattice enthalpy: ionic-bond strength is later quantified using Born-Haber cycles.	**Curriculum enactment** **1.** Retrieve electron arrangement and ion formation. **2.** Teach each bonding model separately, then compare using electrostatic explanations. **3.** Use physical and drawn models while identifying what each representation shows and omits. **Priority misconceptions and planned fixes** **1.** Ionic compounds contain molecules -> use lattice models and formula units. **2.** Covalent bonds are shared atoms -> emphasise shared electron pairs and electrostatic attraction. **3.** Metallic bonding is neutral atoms in a sea -> distinguish positive ions and delocalised electrons. **4.** Bonds are physical sticks -> evaluate representational limitations. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice before independent application. **4.** Preserve the intended curriculum outcome for all students.	**Students will know and be able to** **1.** Metals and non-metals; electron arrangement and periodic position. **2.** Ionic, covalent and metallic bonding; dot-and-cross diagrams; simple molecules; giant structures; model limitations. **Assessment checkpoints** **1.** Electron-structure retrieval. **2.** Ion-formation hinge questions. **3.** Dot-and-cross checkpoint. **4.** Comparative extended explanation. 5. C1 and C2.2 practice test, followed by the separate C1 and C2.2 official test before the end-of-Year 9 examination. 6. End-of-Year 9 examination covers C1.1-C2.2 inclusive only; C2.3 is excluded. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

6. C2.3 Properties of Materials

TERM	INTENT	IMPLEMENTATION	IMPACT
Curriculum period	Knowledge, rationale and progression	Pedagogy, misconceptions and inclusion	Outcomes and assessment evidence
Period **1.** Summer Term 2 | Weeks 32-39	**Substantive knowledge** **1.** Properties of ionic, simple molecular, metallic, polymeric and giant covalent substances. **2.** Diamond, graphite, graphene and fullerenes; intermolecular forces; carbon chains and rings; nanoparticles and surface area. **Why this now?** **1.** Applies bonding knowledge to observable evidence. **2.** Prepares for rates, energetics, organic chemistry and materials science. **Explicit OCR A Level Chemistry A links** **1.** H432 2.2.2: intermolecular forces, giant lattices and structure-property relationships. **2.** H432 3.1.1: diamond, graphite, graphene, silicon and metallic structures. **3.** H432 3.2.1: bond breaking, bond making and average bond enthalpy. **4.** H432 4.1 and 6.2.3: carbon bonding, formula representation, hydrocarbons and polymers. **5.** H432 HSW9-HSW12: applications, benefits, risks, ethics and evidence-based decisions.	**Curriculum enactment** **1.** Use structure-property explanation frames, then remove scaffolds. **2.** Interpret conductivity, melting-point and strength data. **3.** Model carbon allotropes; calculate surface-area-to-volume ratio; evaluate nanoparticle evidence and risk. **Priority misconceptions and planned fixes** **1.** Breaking bonds releases energy -> distinguish bond breaking from bond making. **2.** Simple molecules contain weak covalent bonds -> distinguish intramolecular bonds from intermolecular forces. **3.** Atoms display bulk properties -> connect microscopic structure to macroscopic evidence. **4.** Nano means any small object -> use orders of magnitude and scale comparisons. **Inclusive access** **1.** Pre-teach vocabulary and symbols. **2.** Chunk multi-step representations and calculations. **3.** Use worked examples and guided practice	**Students will know and be able to** **1.** Properties of ionic, simple molecular, metallic, polymeric and giant covalent substances. **2.** Diamond, graphite, graphene and fullerenes; intermolecular forces; carbon chains and rings; nanoparticles and surface area. **Assessment checkpoints** 1. C2.3 begins only after the end-of-Year 9 examination. **2.** Structure-property extended explanation. **3.** Data-interpretation checkpoint. **4.** Surface-area-to-volume calculation. **5.** Nanoparticle evaluation. 6. Post-examination synoptic exit task carried into Year 10 retrieval. **Departmental response** **1.** Use question-level evidence to identify the underlying knowledge gap. **2.** Reteach the concept rather than the exact question. **3.** Complete DIRT and check transfer using a new question.

TERM	INTENT	IMPLEMENTATION	IMPACT
		before independent application. **4.** Preserve the intended curriculum outcome for all students.	

Assessment Checkpoint Summary

Checkpoint	Indicative timing	Content	Evidence	Follow-up
Entry diagnostic	September 2026	KS3 particles, atoms, formulae and separation	Low-stakes diagnostic	Plan retrieval and targeted support.
C1 practice test and booklet check	Week beginning 19 October 2026	C1.1-C1.2	Practice test and completed C1 booklet	Teacher-set revision before official test.
C1 official test	16-27 November 2026	C1.1-C1.2	Common official test	Combined DIRT, responsive reteaching and transfer in the next Chemistry lesson.
C2.1 practical and calculation checkpoints	January-February 2027	Purity, separation, Rf, relative mass and empirical formula	Practical records and checkpoint questions	Address procedural and mathematical gaps.
C1 and C2.2 practice test	Early May 2027	C1 and C2.2, with cumulative retrieval of C2.1	Practice test and completed booklet sections	Teacher-set revision before official test.
C1 and C2.2 official test	Mid-May 2027	C1 and C2.2	Common official test	Combined feedback, DIRT, responsive reteaching and transfer before the end-of-Year 9 examination.
End-of-Year 9 examination	June 2027, before C2.3 begins	C1.1-C2.2 inclusive only; C2.3 excluded	Common examination and question-level analysis	Inform C2.3 teaching and Year 10 retrieval.
C2.3 post-examination tasks	Late June-July 2027	Carbon, properties, intermolecular forces and nanoparticles	Formative and synoptic tasks	Record Year 10 retrieval priorities.

OCR A Level Readiness and Assessment Progression

Year 9 foundation	Exact H432 progression	Year 9 evidence	Readiness indicator
Scientific models and evidence	2.1.1 atomic models; 2.2.1 refined electron models; HSW1 and HSW7	Atomic-model explanation and evaluation	Explains why models change and identifies limitations.
Quantitative representation	2.1.1 relative mass; 2.1.2 formulae and equations; 2.1.3 amount of substance; M0-M2	Ar, Mr, empirical formula and ratio checkpoints	Moves accurately between particle, symbolic and numerical forms.
Structure-property reasoning	2.2.2 bonding and structure; 3.1.1 periodicity; 5.2.1 lattice enthalpy	Comparative explanation and data interpretation	Uses electrostatic language and evidence rather than lists.
Practical thinking	Module 1.1 planning, implementing, analysis and evaluation; 1.2.2 apparatus	Chromatography and distillation records	Selects apparatus, records accurately, analyses evidence and evaluates limitations.
Synoptic application	All H432 components include synoptic assessment; AO2 and AO3 emphasise application and evaluation	Cumulative assessments and end-of-year examination	Applies prior knowledge in unfamiliar theoretical and practical contexts.
Scientific communication	HSW8 and extended response across components	Modelled and independent explanations	Constructs a sustained, coherent line of reasoning.

Routine Curriculum Evaluation and Ofsted Readiness

This section supports normal departmental self-evaluation. It is not inspection-only paperwork.

Focus	Expected practice	Routine evidence	Department response
Curriculum coherence	Teachers make prior and future links explicit.	Student work, retrieval, assessment and discussion.	Adjust sequencing where prerequisite knowledge is insecure.
Ambition and inclusion	All students study the same ambitious core; scaffolds support access.	SEND information, participation, work and outcomes.	Refine vocabulary, models, chunking and guided practice.
Reading and vocabulary	Students read scientific texts and use precise terminology.	Oral and written explanations and practical records.	Pre-teach vocabulary and model disciplinary reading.
Practical entitlement	Practical work develops knowledge and disciplinary competence.	Records, apparatus use, analysis and safety.	Track experience and revisit techniques.
Long-term retention	Previously taught content is revisited cumulatively.	Quizzes, homework and common assessments.	Increase retrieval for fragile or prerequisite concepts.
Assessment validity	Assessment samples knowledge, application, mathematics and practical understanding.	Moderation and question-level analysis.	Review design and reteach causes of error.
Student experience	Students understand what they learn, its connections and the purpose of feedback.	Student discussion, books and DIRT.	Clarify purpose and address inconsistency between classes.
Annual review	The map is reviewed against specifications, outcomes and classroom evidence.	Department meetings, work scrutiny and assessment review.	Record concise changes and intended impact.

Document Control

Owner	Head of Chemistry	Academic year	2026-2027
Qualification	OCR GCSE Chemistry A J248	**Post-16 progression**	OCR A Level Chemistry A H432, Version 2.9
Review evidence	Specification updates; assessment analysis; work scrutiny; student experience	**Review cycle**	Annual and after material specification change
Related documents	Schemes of work; assessment plan; practical tracker; Teaching and Learning Policy	**Status**	Department working document

Year 9 Chemistry Timetable and Delivery Controls

Control	Department expectation
Two-week cycle	Week A = odd; Week B = even. The school year begins with Week A. Holiday weeks do not advance the cycle.
Subject allocation	Three GCSE science lessons per fortnight: one Chemistry, one Biology and one Physics. Use the yellow-coded Chemistry cell in the attached Year 9 table.
Lesson sequence	Classes follow the same numbered Chemistry sequence, but exact calendar dates may vary by class allocation.
Summer examination	Reserve one Chemistry allocation. Examination scope: C1.1-C2.2 inclusive; C2.3 excluded.
Post-examination curriculum	Teach C2.3 after the examination. The final three-day week is consolidation only and carries no essential new content.
Assessment sequence	C1 practice, C1 official test and combined feedback; later C1+C2.2 practice and official test before the summer examination.
Homework	Teacher-set revision plus relevant Past Paper Question Unit Booklet sections, completed before the relevant practice test.
Calendar governance	Use the latest school calendar and update provisional SIMS-linked dates when the final 2026-2027 reporting schedule is issued.