<table>
<tr><th colspan="2">Key Stage 5 (12)</th></tr>
<tr><td colspan="2">Course title: Chemistry B (salters) A-Level</td></tr>
<tr><td colspan="2">Exam board: OCR</td></tr>
<tr><td colspan="2">Specification code: H433</td></tr>
<tr><td rowspan="2">Autumn 1 (September – October) to Autumn 2 (October – December)</td><td>Teacher 1 Elements of Life (EL)

The chemical ideas in this module are:
• atomic structure, atomic spectra and electron configurations
• fusion reactions
• mass spectroscopy and isotopes
• the periodic table and Group 2 chemistry
• bonding and the shapes of molecules
• chemical equations and amount of substance (moles)
• ions: formulae, charge density, tests
• titrations and titration calculations.

This topic is an introduction to some of the inorganic chemistry topic areas and physical chemistry areas to be built on later. It allows for the development of fundamental practical skills such as titration. It also introduces and extends mathematical skills needed across both sides of the course.</td></tr>
<tr><td>Teacher 2 Developing Fuels (DF)

The chemical ideas in this module are:
• thermochemistry
• organic chemistry: names and combustion of alkanes, alkenes, alcohols
• heterogeneous catalysis
• reactions of alkenes
• addition polymers
• electrophilic addition
• gas volume calculations
• shapes of organic molecules, σ- and π-bonds
• structural and E/Z isomers
• dealing with polluting gases.

This topic introduces key thermodynamic chemistry concepts such as enthalpy changes of combustion, and the practical skills that are used building upon GCSE skills. It also interleaves with both Combined science and Triple science knowledge of carbon-based molecules. Introduced is the idea of errors and the calculation of them.</td></tr>
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<tr><td rowspan="3">Spring 1 (January – February) to Spring 2 (February – March)</td><td>Teacher 1 Finish and review of (EL) and then Elements from the Sea (ES)

This topic is started towards the end of January.
The chemical ideas in this teaching module in term 2 are:
• halogen chemistry
• redox chemistry and electrolysis.

In the context of ionic compounds from the sea: This topic builds on GCSE ideas of REDOX and extends it with oxidation numbers; builds and extends understanding of electrolysis; builds upon understanding of equilibria.</td></tr>
<tr><td>Teacher 2 Ozone (OZ)

The chemical ideas in this module are:

• composition by volume of gases
• the electromagnetic spectrum and the interaction of radiation with matter
• rates of reaction
• radical reactions
• intermolecular bonding
• haloalkanes
• nucleophilic substitution reactions
• the sustainability of the ozone layer.</td></tr>
<tr><td>In the context of photochemical reactions: This topic builds on work in EL on relationship between energy and frequency of absorbed light and how this can lead to bond breaking. Knowledge on reaction kinetics from GCSE extended into relationship to energy (M-B distribution); extending understanding of the relationship between boiling temps of simple covalent to specific IMF linking to ES topic; extension of carbon chemistry knowledge.</td></tr>
<tr><td rowspan="2">Summer 1 (April – June) to Summer 2 (June – July)</td><td>Teacher 1 Continue with Elements from the Sea (ES)
The chemical ideas left to teach in this module are:
• equilibrium
• atom economy.

In the context of ionic compounds from the sea: This topic builds on GCSE understanding of equilibria.</td></tr>
<tr><td>Teacher 2 What’s in a Medicine (WM)
The chemical ideas in this module are:
• the chemistry of the –OH group, phenols and alcohols
• carboxylic acids and esters
• mass spectroscopy and IR spectroscopy
• organic synthesis, preparative techniques and thin layer chromatography
• green chemistry.

This topic allows this introduction of more complex functional groups such as alcohols, carboxylic acids, phenols and esters and their interrelationships. We introduce the ideas of spectroscopy which are extended in year 13.</td></tr>
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	Teacher 1 Chemical Industry (CI) This A2 topic are started in June and reviewed in September. This topic builds upon shapes of molecules (EL) and oxidation state (ES); reviews equilibria (ES) and then moves into quantitative rate calculation from qualitative rate (OZ).
	Teacher 2 Polymers of Life This A2 topic are started in June and reviewed in September. On the basis of a foundation knowledge built in earlier topics (DF OZ and WM), we move into some biochemistry to teach further condensation reactions, linking to IMFs topic (OZ) for RNA base pairing, amine and amide chemistry, extend understanding of isomers into optical isomerism. Link to the study of IR spectroscopy, we conclude the topic with full spectroscopic analysis of materials.

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<tr><td rowspan="3">Autumn 1 (September – October) to Autumn 2 (October – December)</td><td>Teacher 1 Chemical Industry (CI)

Review of what had been taught in June and July:
• aspects of nitrogen chemistry
• kinetics
• equilibrium and equilibrium constant calculations
• effects of factors on the rate and equilibrium yields of reactions; consideration of the best conditions for an industrial process
• analysis of costs, benefits and risks of industrial processes.

This topic builds upon shapes of molecules (EL) and oxidation state (ES); reviews equilibria (ES) and then moves into quantitative rate calculation from qualitative rate (OZ).</td></tr>
<tr><td>Teacher 2 Polymers of Life

Review what had been taught in June and July:
• condensation polymers
• organic functional groups
• amines and amides
• acid–base equilibria
• amino acid and protein chemistry
• optical isomerism
• enzyme catalysis and molecular recognition
• the structure and function of DNA and RNA
• structural analysis.

On the basis of a foundation knowledge built in earlier topics (DF OZ and WM), we move into some biochemistry to teach further condensation reactions, linking to IMFs topic (OZ) for RNA base pairing, amine and amide chemistry, extend understanding of isomers into optical isomerism. Link to the study of IR spectroscopy, we conclude the topic with full spectroscopic analysis of materials.</td></tr>
<tr><td>Teacher 1 Developing Metals (DM)

This topic is started in November:
• redox titrations
• cells and electrode potentials
• d-block chemistry
• colorimetry.

Having gained an understanding of redox (ES), we apply it to the more challenging ‘d’ block variable oxidation; introducing the idea of quantitative reactivity series (Reduction Potentials) and their measurement; to the chemistry of complex aqueous ions and ligand substitution and how this affects solubility and colour.</td></tr>
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Spring 1 (January – February) to Spring 2 (February – March)	**Teacher 1 Developing Metals (DM)** This topic is finished in January and February: • redox titrations • cells and electrode potentials • d-block chemistry • colorimetry. Having gained an understanding of redox (ES), we apply it to the more challenging 'd' block variable oxidation; introducing the idea of quantitative reactivity series (Reduction Potentials) and their measurement; to the chemistry of complex aqueous ions and ligand substitution and how this affects solubility and colour.
	Teacher 2 Colour by Design (CD) • the chemical origins of colour in organic compounds • aromatic compounds and their reactions • dyes and dyeing • diazonium compounds • fats and oils • gas–liquid chromatography • carbonyl compounds and their reactions • organic synthesis and polyfunctional compounds. The final group of organic molecules not studied are the aromatic series. In the context of dyes, we look at conjugation, and what it means to be an aromatic compound. How this affects their reactions – substitution not addition – and examples of transformations. These are linked to the processes needed to make dyes. We link this also to the IMF taught earlier (OZ) to explain why they bind to different cloth types dependant on the nature of the cloth (cottons being carbohydrates; wools being proteins etc).
	Teacher 1 and 2 Oceans • acid–base equilibria and pH • solubility products • dissolving and associated enthalpy changes • the greenhouse effect • entropy. Though this could be taught before Developing Metals, the understanding of pH and equilibria of their reactions is a good final topic since little else relies on it's understanding. Links go back to equilibria in (CI) and (ES) and patterns of solubility due to cation and anion size and their charge density introduced in (ES). This section of Oceans also deals with the energy changes associated with the oceans and finishing off thermodynamics with the final sentence that is entropy! Nothing else relies upon this understanding other than reactions driven by disorder change such as EDTA complex formation so works well at the end.
Summer 1 (April – June) to Summer 2 (June – July)	Revision