**Curriculum Intent**

**Curriculum Implementation**

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|  | | | **Autumn** | | **Spring** | | **Summer** | |
| **Elements of Life** | **Developing Fuels** | **Ozone** | **Elements from the Sea** | **What’s In A medicine** | **Practical Skills and YR2** |
| **Year 12** | **BROAD** | Core content, knowledge, and skills | * atomic structure, atomic spectra and electron configurations * fusion reactions * mass spectrometry 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. | * 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. | * 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. | * halogen chemistry * redox chemistry and electrolysis * equilibrium * atom economy. | * the chemistry of the –OH group, phenols and alcohols * carboxylic acids and esters * mass spectrometry and IR spectroscopy * organic synthesis, preparative techniques and * thin layer chromatography * green chemistry. | * Formulae, equations and amount of substance * Planning, Implementing, Analysis & Evaluation. * **Practical Endorsement:** * PAG 1 – 6 + 12   **Year 2**   * Chemical Industry * Polymers and Life * (See Year 13 for specifics) |
| **COHERENT** | Prior knowledge required to access this unit | All students need to have gained a minimum of grade 6-6 in combined science GCSE, or an average of a 6 across the three sciences (with a 6 in chemistry) if the triple sciences have been completed. Different exam boards implement the GCSE topics in different ways, so it isn’t possible to map specific areas to specific chapters in Year 1. | | | | | |
| **EMPOWERING** | Key vocabulary | Too much to list in its entirety. Key vocabulary is shown in bold throughout each chapter with definitions given in the glossary at the back of the textbook. | | | | | |
| **CHALLENGING** | Super curricular recommendations | Visit museums e.g. The Wellcome Collection, Science Gallery London, Kirkaldy’s Testing Works, or the Science Museum.  Join a society such as the RSC or the Royal Society  Suggested Reading – any book by Sam Kean who has written several excellent and accessible Chemistry focused science books.  Visit the Royal Society Summer Science Exhibitions (usually held near the start of July)  Online MOOC e.g. “Discovering Science” series on Future Learn, <https://www.coursera.org/learn/physical-chemistry> - provided by the University of Manchester or <https://www.york.ac.uk/study/moocs/exploring-everyday-chemistry/> from the University of York  Podcasts:  <https://www.rsc.org/periodic-table/podcast>  <https://what-if.xkcd.com/>  Writing Competition:  The Biochemical Society: Science Communication Prize More info at: https://www.biochemistry.org/education/science-communication | | | | | |

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|  | | | **Autumn** | | | **Spring** | | **Summer** |
| **Chemical Industry** | **Polymers and Life** | **Oceans** | **Developing Metals** | **Colour By Design** | **Revision and Preparation** |
| **Year 13** | **BROAD** | Core content, knowledge and skills | * 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. | * 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. | * dissolving and associated enthalpy changes * the greenhouse effect * acid–base equilibria and pH * solubility products * entropy. | * redox titrations * cells and electrode potentials * d-block chemistry * colorimetry. | * 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. | National Exams commence early June |
| **COHERENT** | Prior knowledge required to access this unit | Chemical ideas from year 1 units: ES and OZ | Chemical ideas from Year 1 units: DF, OZ and WM | Chemical ideas from Year 1 units: DF and OZ | Chemical ideas from Year 1 units: EL and ES  As well as Year 2 unit: CI | Chemical ideas from Year 1 units: DF, OZ and WM  As well as Year 2: PL |  |
| **EMPOWERING** | Key vocabulary | Too much to list in its entirety. Key vocabulary is shown in bold throughout each chapter with definitions given in the glossary at the back of the textbook. | | | | | |
| **CHALLENGING** | Super curricular recommendations | Reading: “Mauve” by Simon Garfield, “H2O: A Biography of Water” by Philip Ball  <https://player.fm/series/chemistry-for-your-life>  <https://player.fm/series/the-haz-mat-guys-podcast-2391442> | | | | | |