**Y10 – Separate Science (Chemistry)**

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|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | | Summer 1 | Summer 2 |
| Big Ideas | C4a – \*Chemical changes | C4b – \*Chemical changes | C5- \*Energy changes | C6a –\* The rate and extent of chemical change | | C6b –\* The rate and extent of chemical change | C7 – \*Organic chemistry |
| Topics | Reactivity of metals  Acids and alkalis  Neutralisation  Soluble Salts  Titrations | Extracting metals  The process of electrolysis  Redox reactions | Exothermic and endothermic reactions  Energy profile diagrams  Calculating bond energies  Cells and batteries  Fuel cells | Factors affecting the rate of reaction  Collision theory  Calculating rates of reaction  Catalysts | | Reversible reactions  Facts affecting equilibrium  The Haber Process  NPK fertilisers | Hydrocarbons  Alkanes and alkenes  Fractional distillation  Cracking  Alcohols  Carboxylic acids  Polymers |
| Skills | DEVELOPMENT OF SCIENTIFIC THINKING  - Understanding how scientific theories develop over time  - Use a variety of models to represent ideas  - Appreciate ethical issues  - Describe and evaluate methods  - Recognise the importance of peer review | | EXPERIMENTAL SKILLS & STRATEGIES  -Plan investigations  - Carry out investigations  - Describe and suggest techniques  - Mathematical and statistical analysis | | | APPARATUS & TECHNIQUES  -Use a range of equipment to take measurements  - Safe use of heating equipment  - Use a range of equipment to observe chemical reactions  -Safe use of chemical gases and reagents  - Measure rates of reaction and energy transfers  - Using equipment for electrochemical processes | |
| Assessment | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments  Paper 1 END OF YEAR ASSESSMENT |
| Linked learning | Pupils will have knowledge of the fundamental ideas of chemistry such as atomic structure, bonding and quantitative chemistry. Working scientifically skills relating to methodology, variables, apparatus and collecting data. Learning components at the start of the lesson remind students of prior learning and point out links to previous topics.  Links with other subjects: Maths – 20% of the science GCSE is based on the basic mathematical functions and skills necessary for quantitative chemistry and equations. English – reading, writing and communication. MFL – support with the development of learning an additional language for scientific literacy. Physics – consolidation knowledge of atomic structure, isotopes, and ions. Biology – consolidate knowledge of DNA and amino acid structures. Biology and Physics – consolidate working scientifically skills and scientific literacy. | | | | | | |
| \*SMSC Links | 253 Provision for the spiritual development of pupils includes developing their:  - ability to be reflective about their own beliefs and perspective on life  - sense of enjoyment and fascination in learning about themselves, others, and the world around them,  - Use of imagination and creativity in their learning  254 Provision for the moral development of pupils includes developing their:  -understanding of the consequences of their behaviour and actions  - interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues | | | | | | |
| Literacy | Scientific vocabulary, terminology, and definition  Interpret observations, write conclusions, describe, and explain common concepts, compare, and evaluate | | | Numeracy | Use decimal forms, standard form, ratios, fractions, percentages, makes estimates, uncertainties, determining quantities, SI units, convert units, probability  Handling data: interpret data, significant figures, construct tables and graphs, order of magnitude, scatter diagrams, calculate means, mode and median  Algebra: use common expressions, solve simple algebraic equations, rearrange equations, substitute numbers  Graphs: translate information between tables and graphs, understand linear relationships, plot variables, calculate surface area and volume | | |
| Enrichment | Period 6 CLIMB sessions.  Developing STEM ambassador visitors to engage and inspire students.  GCSE Science Live Trip | | | | | | |
| Impact | Students are required to memorise key facts and be able to recall them and apply their knowledge to real life situations. A successful student will be able to demonstrate critical thinking to the topics taught which can be demonstrated through recall and extended written work. Resilience in handling more complex processes and concepts. They will have the ability to take care of their emerging learning needs. Secure prior knowledge and links to new information. Greater scientific literacy. Science will help students to become logical thinkers and problem solvers with a batter understanding of the world around them. Demonstrating resilience and the ability to consider moral and ethical implications of scientific developments. | | | | | | |

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| Ways to support student learning in this subject |
| * Encourage the completion of homework. * Encourage discussion of science issues that arise in the news. * Discuss science lessons and their progress. * Encourage a positive attitude towards science. * Encourage the use of the Periodic Table when completing homework * Encourage self-assessment and reflection using personalised learning checklists (PLCs) * Practice units, unit conversions, standard form, rearranging equations and encourage the use of a calculator * Use of low stakes questioning and exam material to build confidence and knowledge base * Encourage students to use GCSEPod to consolidate knowledge and build on recall skills * Refer students to LaunchPad revision materials * Purchase CGP revision guides and workbooks for independent revision and practice |