

2023-2024 Year 11 Curriculum and Assessment Plan for Chemistry

The curriculum and assessment of pupils at this stage of education has been carefully designed to enable students to access a deeper understanding of Chemical processes that underpin life on this planet
NB – students following the foundation tier will not complete anything marked HT on the specification links

<p>Half Term 1:</p> <p>All pupils will know: The Rates topic as referred to between pages 98-104 on this document: GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk) and The Analysis topic as referred to between pages 107-110 on this document: GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed by: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact- Why do we teach this? Chemical reactions can occur at vastly different rates. Whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are many variables that can be manipulated in order to speed them up or slow them down. Chemical reactions may also be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired product. Understanding energy changes that accompany chemical reactions is important for this process. In industry, chemists and chemical engineers determine the effect of different variables on reaction rate and yield of product. Whilst there may be compromises to be made, they carry out optimisation processes to ensure that enough product is produced within a sufficient time, and in an energy-efficient way</p> <p>Analysts have developed a range of qualitative tests to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate. Instrumental methods provide fast, sensitive and accurate means of analysing chemicals, and are particularly useful when the amount of chemical being analysed is small. Forensic scientists and</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Recognise and use expressions in decimal form. MS 1c Use ratios, fractions and percentages. MS 1d Make estimates of the results of simple calculations. MS 4a Translate information between graphical and numeric form. MS 4b Drawing and interpreting appropriate graphs from data to determine rate of reaction. MS 4c Plot two variables from experimental or other data. MS 4d Determine the slope and intercept of a linear graph. MS 4e Draw and use the slope of a tangent to a curve as a measure of rate of change. AT 5 An opportunity to investigate the catalytic effect of adding different metal salts to a reaction such as the decomposition of hydrogen peroxide. Recognise and use expressions in decimal form. MS 1c Use ratios, fractions and percentages. MS 1d Make estimates of the results of simple calculations. 	<p>Half Term 2:</p> <p>All pupils will know: The Organic topic as referred to between pages 104-107 on this document: GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk) and The Resources topic as referred to between pages 115-120 on this document: GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact - Why do we teach this? The chemistry of carbon compounds is so important that it forms a separate branch of chemistry. A great variety of carbon compounds is possible because carbon atoms can form chains and rings linked by C-C bonds. This branch of chemistry gets its name from the fact that the main sources of organic compounds are living, or once-living materials from plants and animals. These sources include fossil fuels which are a major source of feedstock for the petrochemical industry. Chemists are able to take organic molecules and modify them in many ways to make new and useful materials such as polymers, pharmaceuticals, perfumes and flavourings, dyes and detergents.</p> <p>Industries use the Earth's natural resources to manufacture useful products. In order to operate sustainably, chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products. Chemists also aim to develop ways of disposing of products at the end of their useful life in ways that ensure that materials and stored energy are utilised. Pollution, disposal of waste products and changing land use has a significant effect on the environment, and environmental chemists study how human activity has affected the Earth's natural cycles, and how damaging effects can be minimised.</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Make models of alkane molecules using the molecular modelling kits. Investigate the properties of different hydrocarbons Translate information between graphical and numeric form. LCAs should be done as a comparison of the impact on the environment of the stages in the life of a product, and only quantified where data is readily available for energy, water, resources and wastes. Interpret LCAs of materials or products given appropriate information. MS 1a Recognise and use expressions in decimal form. MS 1c Use ratios, fractions and percentages. MS 1d Make estimates of the results of simple calculations. MS 2a Use an appropriate number of significant figures. MS 4a Translate information between graphical and numeric form. 	<p>Half Term 3:</p> <p>All pupils will know: REVISION The Atmosphere topic as referred to between pages 110-115 on this document: GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact - Why do we teach this? <i>The Earth's atmosphere is dynamic and forever changing. The causes of these changes are sometimes man-made and sometimes part of many natural cycles. Scientists use very complex software to predict weather and climate change as there are many variables that can influence this. The problems caused by increased levels of air pollutants require scientists and engineers to develop solutions that help to reduce the impact of human activity.</i></p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> To use ratios, fractions and percentages. An opportunity to show that aquatic plants produce oxygen in daylight.
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<p>drug control scientists rely on such instrumental methods in their work.</p>	<p>Reading Skills needed for this unit:</p> <p>Key Vocabulary: Enthalpy, rate, concentration, mole, mean rate, tangent, equilibrium, chromatography, pencil line, R-value, solvent line, sample line, pure, formulation, mobile phase, stationary phase</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> MS 4b Drawing and interpreting appropriate graphs from data to determine rate of reaction. MS 4c Plot two variables from experimental or other data. MS 4d Determine the slope and intercept of a linear graph. MS 4e Draw and use the slope of a tangent to a curve as a measure of rate of change. 		<p>Reading Skills needed for this unit:</p> <p>Key Vocabulary: Alkane, fractional distillation, fraction, hydrocarbon, bromine test, alkene, cracking, ball and stick diagram, combustion,</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Recognise and use expressions in decimal form. MS 1c Use ratios, fractions and percentages. MS 1d Make estimates of the results of simple calculations. MS 2a Use an appropriate number of significant figures. MS 4a Translate information between graphical and numeric form. 		<p>Reading Skills needed for this unit:</p> <p>Key Vocabulary: Atmosphere, carbon dioxide, volcano, algae, oxygen, water vapour, ocean, sedimentation, precipitation, photosynthesis, nitrogen, sulphur dioxide, nitrous oxides, greenhouse effect, infra red, short wavelength, long wavelength, reradiated.</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> To use ratios, fractions and percentages.
<p>Half Term 4:</p> <p>All pupils will know: To revise key areas from this document GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact - Why do we teach this?</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Exam prep <p>Reading Skills needed for this unit: see specification</p> <p>Key Vocabulary: see specification</p>	<p>Half Term 5:</p> <p>All pupils will know: To revise key areas from this document GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact - Why do we teach this?</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Exam prep <p>Reading Skills needed for this unit: see specification</p> <p>Key Vocabulary: see specification</p>	<p>Half Term 6:</p> <p>All pupils will know: To revise key areas from this document GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016 (aaa.org.uk)</p> <p>All pupils will be assessed: By short recall activities, electronic automatically marked homework's and longer answer short tests focussed on the topics. There will also be a longer exam as part of the data gathering for the whole year group twice a year</p> <p>Impact- Why do we teach this? To enable best possible outcomes on external exams</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Exam prep <p>Reading Skills needed for this unit: see specification</p> <p>Key Vocabulary: see specification</p>

<p>To enable best possible outcomes on external exams</p>	<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> • see specification 	<p>To enable best possible outcomes on external exams</p>	<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> • see specification 		<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> • see specification
<p>Ensuring this curriculum meets the needs of all pupils: this curriculum has been designed to ensure pupils from all starting points will develop the key curriculum skills and knowledge identified. The curriculum design ensures that each unit forms part of the overall learning journey and there are opportunities for revisiting skills and linking together key pieces of knowledge. Whole Academy policies and practices are followed to tailor the delivery of the curriculum for individuals and groups of students. For example SEND students have individual learning profiles that outline needs/strategies to be used, Whole group RIPs are in place to identify key teaching strategies that will be used with individual teaching groups. Ongoing formative assessment and clear summative assessment points allow individual staff and departments to identify misconception and adjust curriculum appropriately.</p>					
<p>Enrichment opportunities:</p> <ul style="list-style-type: none"> • 					
<p>Career opportunities/ links:</p>					