Chemistry Curriculum Overview Year 10 2024-25

Unit Title	Unit 3- Quantitative Chemistry	Unit 4 – Chemical Changes
Approximate Number of Lessons	12 lessons	12 lessons
Curriculum Content	Chemists use quantitative analysis to determine the formulae of compounds and the equations for reactions. Given this information, analysts can then use quantitative methods to determine the purity of chemical samples and to monitor the yield from chemical reactions. Chemical reactions can be classified in various ways. Identifying different types of chemical reaction allows chemists to make sense of how different chemicals react together, to establish patterns and to make predictions about the behaviour of other chemicals. Chemical equations provide a means of representing chemical reactions and are a key way for chemists to communicate chemical ideas. Overview of content: • Balancing Equations • Conservation of Mass • How is Relative Formula Mass Calculated • Changes of mass during a reaction • Moles • Reacting Masses • Limiting reactants • Concentration of Solutions • Percentage Yield • Atom Economy • Further calculating concentrations (titrations) • Volume of gases.	Understanding of chemical changes began when people began experimenting with chemical reactions in a systematic way and organizing their results logically. Knowing about these different chemical changes meant that scientists could begin to predict exactly what new substances would be formed and use this knowledge to develop a wide range of different materials and processes. It also helped biochemists to understand the complex reactions that take place in living organisms. The extraction of important resources from the earth makes use of the way that some elements and compounds react with each other and how easily they can be 'pulled apart'. Overview of content: • The Reactivity Series • Displacement Reactions • Extracting Metals • Salts from Metals • Insoluble Bases • Making more salts • Neutralisation and the pH Scale. • Strong and Weak Acids • Introduction to Electrolysis. • Changes at the Electrodes. • Metals and their Extractions • Electrolysis of Aqueous Solutions
Links to prior learning	Y7 & 8 Chemical Reactions • Matter and reactions • C1: Atomic structure and the periodic table • C2: Chemical bonds	KS3 Year 7 & 8 – Particles, Acids & Alkalis & chemical reactions KS4 C1 Atomic structure and the periodic table C2 Bonding, structure and the properties of matter

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Cultural Capital Opportunities	**Places to visit locally**- • https://cambridgesciencecentre.org/ Experience hands-on adventures in STEM – adventures that will inspire them to do well in life and make a positive contribution to their communities. (near Clip n' climb behind Cambridge Station). • https://www.festival.cam.ac.uk/ Cambridge science festival website- has lots of resources and ideas and events happening in and around Cambridge. • https://stem.wsc.ac.uk/stemtastic21/cambridge-science-centre/ from West Suffolk College in Bury St Edmunds-lots of free STEM activities and online **Reading suggestions- inside or outside of school** • New Scientist, National Geographic & National geographic Junior. • https://kids.frontiersin.org/ Frontiers for Young Minds is an open access (free) **scientific** journal that brings the latest research in real time to school **kids** between 8-15 years old. Online resources- apps, websites etc. • https://edu.rsc.org/resources Royal Society of Chemistry- for lots of resources, quizzes and an interactive Periodic Table. • https://phet.colorado.edu/en/simulations/filter?subjects=chemistry&type=html&sort=alpha&view=grid PhET online simulator- some great free simulations to help visualise some of the concepts taught in GCSE Chemistry.	**Places to visit locally**- • https://cambridgesciencecentre.org/ Experience hands-on adventures in STEM – adventures that will inspire them to do well in life and make a positive contribution to their communities. (near Clip n' climb behind Cambridge Station). • https://www.festival.cam.ac.uk/ Cambridge science festival website- has lots of resources and ideas and events happening in and around Cambridge. • https://stem.wsc.ac.uk/stemtastic21/cambridge-science-centre/ from West Suffolk College in Bury St Edmunds-lots of free STEM activities and online **Reading suggestions- inside or outside of school** • New Scientist, National Geographic & National geographic Junior. • https://kids.frontiersin.org/ Frontiers for Young Minds is an open access (free) **scientific** journal that brings the latest research in real time to school **kids** between 8-15 years old. Online resources- apps, websites etc. • https://edu.rsc.org/resources Royal Society of Chemistry- for lots of resources, quizzes and an interactive Periodic Table. • https://phet.colorado.edu/en/simulations/filter?subjects=chemistry&type=html&sort=alpha&view=grid PhET online simulator- some great free simulations to help visualise some of the concepts taught in GCSE Chemistry.
Assessment Focus	End of topic test on Quantitative Chemistry and Bonding, Structure & Properties of Matter.	End of topic test on Chemical Changes and Quantitative Chemistry.
Name of Knowledge Organiser/Link to Organiser		

Unit Title	Unit 5- Energy Changes	Unit 6 – Rate of Reactions
Approximate Number of Lessons	4 – 6 lessons	9 lessons
Curriculum Content	Energy changes are an important part of chemical reactions. The interaction of particles often involves transfers of energy due to the breaking and formation of bonds. Reactions in which energy is released to the surroundings are exothermic reactions, while those that take in thermal energy are endothermic. These interactions between particles can produce heating or cooling effects that are used in a range of everyday applications. Some interactions between ions in an electrolyte result in the production of electricity. Cells and batteries use these chemical reactions to provide electricity. Electricity can also be used to decompose ionic substances and is a useful means of producing elements that are too expensive to extract any other way Overview of content • Exothermic and endothermic reactions • Using energy transfers from reactions • Reaction profiles • Bond energy Calculations • Chemical cells and batteries • Fuel Cells	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. Overview of content • Rates of Reaction • Collision Theory and Surface Area • The Effect of Temperature • The Effects of Concentration and Pressure • The Effects of a Catalyst • Reversible Reactions • Energy and Reversible Reactions
Links to prior learning	Year 7,8,9, bonding, electricity, elements, mixtures, compounds. C2 and C4.	
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Assessment Focus	End of topic test on energy changes and chemical changes	End of topic test on rates of reaction and energy changes.
Name of Knowledge Organiser/Link to Organiser		