GCSE Chemistry KS4 Curriculum Overview 2019 – 20

Science is life, life is science. Explore science. Discover science. Explain science.

Exam board and syllabus name: EDEXCEL GCSE Chemistry		Coursework 0%	Final examination 100%	
Year 9				
Term	**Unit/topic**	**Knowledge**	**Skills**	**Assessment**
Spring term 1	Topic 1: Structure of atom and periodic table	Structure of atom, sub-atomic particles, isotopes, Relative Atomic Mass, Periodic Table.	Formulas of atoms, using the periodic table, calculation of RAM, Evaluating trends and patterns.	Topic 1 End of topic test.
Spring term 2	Continuation of Spring term 1			
Summer term 1	Topic 3: States of matter, separating and purifying	States of matter, pure and impure, mixtures, filtration and crystallisation, chromatography, distillation, drinking water.	Modelling using particle model, explanations using particle model, calculation of Rf value, interpretation of cooling curves etc.	Topic 3 End of topic test Core practical 1: Investigating inks (Part A distillation, Part B Chromatography).
Summer term 2	Continuation of Summer term 1			
Year 10				
Term	**Unit/topic**	**Knowledge**	**Skills**	**Assessment**
Autumn term 1	Topic 2: Structure and bonding	Ions, ionic bonding, properties of ionic compounds, covalent bonding, simple and giant covalent bonding, metals and metallic bonding, allotropes of carbon.	Formula of ions / charges on ions. Writing formula of ionic compounds. Modelling of structures, explanation of structure / property / use relationships, evaluating material data.	Topic 2 End of topic test.
Autumn term 2	Topic 4: Acids	Acids and alkalis, indicators, strong and weak acids, concentration and dilution of acids, reactions of acids with metals, bases and carbonates. Making salts from soluble and insoluble bases, precipitation reactions.	Formulas of acids, using word and symbol equations to represent neutralisation equations, describe the method to make soluble and insoluble salts. Use word and symbol equations to represent precipitation reactions. Use ionic equations to describe chemical change.	Topic 4 End of topic test Core practical 2: Investigating neutralisation Core practical 3: Preparation of copper sulphate crystals.
Spring term 1	Continuation of Autumn term 2			
Spring term 2	Topic 5a: Mass calculations	Types of formula, empirical formula calculations, mass calculations, **Avogadro number and mole calculations.**	Calculations (empirical formula, **mole calculations**, reacting mass calculations), understanding of ratios in equations.	Core practical 4: Electrolysis of copper sulphate solution.
	Topic 5a: Electrolysis	Electrolysis of molten and solution electrolytes.	Explaining electrolysis, predicting what is produced at electrodes, **writing half equations**	

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			and identifying what is oxidised and what is reduced at electrodes.	
	Topic 5a: Metals and metal extraction	Reactivity series, reactions of metals with water and acid, displacement reactions. Methods used for extracting metals.	Analysing and interpreting data of reactivity series, predicting the products from displacement reactions, **writing half equations and describing what is oxidised and what is reduced in displacement reactions**, predicting the method used to extract metal based on reactivity.	
	Topic 5a : Equilibria	Introduction to equilibria and Haber process, conditions for Haber process.	Modelling of equilibria, evaluating industrial processes.	
Summer term 1	Topic 5b: Transition metals etc.	Transition metals, corrosion and alloys.	Explaining structure / property / uses relationships of metals, evaluate methods of corrosion prevention, explain alloys using particle model.	Topic 5a+b End of topic test.
Summer term 2	Topic 6: Further calculations	Mole calculations including solutions, titrations and gas volume calculations. Factors affecting equilibria, chemical cells and fuel cells.	Higher level calculations, % yield and % atom economy complex calculation of moles, concentration of solutions and volume of gases in equations. Method for performing a titration. Evaluate factors that affect the position of an equilibrium and effect on yield. Explain advantages /disadvantage of fuel cells.	Topic 6 End of topic test Core practical 5: Acid alkali titration.
Year 11				
Term	**Unit/topic**	**Knowledge**	**Skills**	**Assessment**
Autumn term 1	Topic 7: Groups in the periodic table	Groups in the Periodic Table (1, 7 and 0). Structure and properties of elements, reactions including Group 1 reactions with water and halogens, halogen displacement reactions.	Explain observations (e.g. when group 1 react with water or halogen displacement). Describe reactions using word and symbol equations.	Interim test: Groups in Periodic Table.
	Topic 7: Rates of reaction	Rates of reaction. What is rate of reaction and how can it be measured? Factors which affect the rate of a reaction (temperature, concentration, pressure,	Plot and understand concentration/time graphs and use gradient to measure rate of reaction. Interpret graphs and predict changes due to changes in conditions. Explain	Interim test: Rates of reaction. Core practical 6a: Rates of reaction – gas volume.

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		particle size, catalyst). Collision theory and catalysts.	how factors effect rate of reaction using ideas about collision theory and frequency of collisions.	Core practical 6b: Rates of reaction – precipitation.
	Topic 7: Energy in reactions	Exothermic / endothermic reactions. Heat transfers of system and surroundings. Drawing reaction profile diagrams, activation energy and the effects of catalysts. Explaining energy change in terms of bond breaking and bond making. Bond energy calculations.	Explain heat transfers in exothermic / endothermic reactions. Measure temperature changes. Explain how reaction profile diagrams change e.g. due to catalyst. Perform Bond Energy calculations and use the result to predict if a reaction is exothermic or endothermic	Interim test: Energy in reactions. Topic 7 End of topic test.
Autumn term 2	Topic 8: Hydrocarbons and fuels	Crude oil and hydrocarbon fuels, fractional distillation, fuels and how they are used, hydrocarbons and alkanes, combustion and combustion equations (complete and incomplete), pollutant gases, acid rain, cracking and why it is used to make better fuels.	Evaluate different fuels, interpret information on different fuels. Explain why different fractions have different properties. Explain how chain length of alkanes effects properties. Write word and symbol equations for complete and incomplete combustion of alkanes. Evaluate different pollutant gases, how they are formed and the problems they cause.	Interim test: hydrocarbons and fuels.
	Topic 8: Earth Science	The Earth's early atmosphere, how and why the atmosphere has changed and what it is like today. The greenhouse effect, global warming its effects. Projects of future change, methods for reducing carbon dioxide emissions.	Interpret data about the early atmosphere and how it has changed. Explain the reasons for increasing oxygen levels. Interpret data about the current atmosphere. Evaluate data about man-made climate change. Predict the effect of future change. Evaluate methods of reducing carbon dioxide emissions.	Interim test: Earth science Topic 8 End of topic test.
Spring term 1	Topic 9: Further organic	Alkanes and alkenes, test for alkanes and alkenes. Reactions of alkenes. Alcohols and production, reactions of alcohols. Carboxylic acids and production, reactions of carboxylic acids. Polymers and properties. Addition polymers, condensation polymers.	Write word and displayed formula equations for reactions of alkanes, alkenes, alcohols and carboxylic acids. Explain some uses of alkanes, alkenes, alcohols and carboxylic acids. Explain how polymers are made and their structure / properties. Draw polymer	Topic 9 End of topic test Core practical 7: Combustion of alcohols.

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			repeat units from monomers and vice versa.	
Spring term 2	Topic 10: Quantitative analysis	Flame tests for positive ions, chemical tests for positive ions, chemical tests for negative ions. Flame photometry. Nanomaterials, composite materials.	Evaluate data from chemical tests to identify the composition of an unknown ionic compound. Explain the advantages of instrumental techniques. Evaluate advantages and disadvantages of nanomaterials. Evaluate materials for different applications including composite materials.	Topic 10 End of topic test Core Practical 8a: Identification of positive ions. Core Practical 8b: Identification of negative ions.
Summer term 1	Revision			
Summer term 2	**Most of this half term is made up of study leave and GCSEs.**			