AQA GCSE Chemistry – Trilogy & Separate Year 10 Curriculum Map

Notre Dame Catholic College

	Autumn Term 1 and 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Curriculum Content	**Composite: Know and understand bond structures and the properties of matter** **Component 1:** Know and describe and explain the different types of bonding; ionic, covalent and metallic. **Component 2**: Know and identify how to represent both ionic and covalent bonding using dot and cross diagrams. **Component 3**: Know and describe suitable diagrams to show metallic bonding and find out about delocalised electrons. **Component 4:** Know and calculate the charge on the ions in an ionic compound. **Component 5**: Know and explore the types of structures produced by the different types of bonding. This includes giant ionic structures, small molecules, polymers, giant covalent structures, and metals and alloys. **Component 6**: Know and investigate properties of each substance type, concentrating on the explanations around bonding and structure. This will include knowledge of intermolecular forces, which is supported by a lesson on states of matter whereby students use the particle theory to explain changes of state. **Component 7**: Know and describe and explain specific examples of bonding types; for giant covalent it is graphite and diamond. **Component 8:** Know and explain the properties of specific examples based on structure and bonding. **Component 9**: Know and explore the new developments of graphene, fullerenes and nanoparticles.	**Composite: Know and understand Quantitative chemistry by determining the formulas for compounds and using equation for reactions.** **Component 1**: Know and identify common symbols and equations. **Component 2**: Know and calculate relative formula masses and be introduced to moles. **Component 3:** Know and use moles to calculate reacting masses and to balance equations, and learn how to calculate theoretical and percentage yields. **Component 4**: Know and describe how concentration is expressed and use this in simple titrations. **Component 5:** Know and describe how to calculate gas volumes and how they apply in equations.	**Composite: Know and understand how interactions of particles involves Energy Changes** **Component 1**: Know and identify exothermic and endothermic changes, use reaction profiles to describe them, calculate theoretical energy transfers using bond energies and investigate the variables that affect the temperature changes in solutions. **Component 2**: Know and investigate voltaic cells and fuel cells and evaluate their usefulness as sources of energy. **Component 3**: Know and identify independent, dependent and control variables; identify the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; read measurements from scales; make and record observations; present data appropriately; recognise and describe patterns and trends; use models in explanations; use data to make predictions; and communicate findings and reasoned conclusions.	**Composite: Know and understand Chemical Changes are vital in the extraction of metals and producing salts.** **Component 1**: Know and explain the oxidation and reduction of metals in terms of loss or gain of oxygen or electrons. **Component 2**: Know and deduce a reactivity series of metals based on experimental results, and relate this to the tendency of metals to form positive ions and the extraction method used to extract each metal. **Component 3**: Know and identify the products formed when molten or dissolved binary compounds are electrolysed, and write equations for the reactions at each electrode. **Component 4:** Know and make soluble salts by neutralising acids with metals, metal oxides, carbonates or alkalis and write equations for these reactions. **Component 5:** Know and distinguish between strong acids and concentrated acids, and explain what happens during neutralisation. **Component 6**: Know and identify independent, dependent and control variables; identify the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; read measurements from scales; make and record observations; present data appropriately; recognise and describe patterns and trends; use models in explanations; use data to make predictions; and communicate findings and reasoned conclusions.	**Composite: Know and understand the Extent and rate of chemical change** **Component 1**: Know and Identify ways of speeding up reactions and use collision theory and ideas about activation energy to make predictions. **Component 2**: Know and explore reversible reactions and use Le Chatelier's principle to predict the effects of changing temperature, pressure and concentration on equilibrium systems. **Component 3**: Know and identify variables and hazards in an investigation. Component 4: Plan and carry out investigations to test different hypotheses. **Component 4**: Know and recognise and describe patterns and trends in data **Component 5**: Know and use models and data to make predictions and communicate findings and reasoned conclusions.

Prior knowledge and skills (from previous year / key stage)	Students should recall the three states of matter and the different changes of state. Students should understand why atoms form bonds, understand the term element and compound. Pupils should be able to construct simple word and symbol equations to show chemical reactions. Students will have an understanding of the properties some substances have e.g. metals are good conductors of electricity	Students will understand the term 'Conservation of mass' , understand what a chemical formula is and be able to construct and destruct simple examples.	Students will be able to identify reactions as endothermic or exothermic. Students will be able to identify independent, dependent and control variables; identify the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; read measurements from scales; make and record observations; present data appropriately; recognise and describe patterns and trends; use models in explanations; use data to make predictions; and communicate findings and reasoned conclusions.	Students will understand where metals are found, the reactivity series and general ideas of extraction. Students will be able to identify independent, dependent and control variables; identify the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; read measurements from scales; make and record observations; present data appropriately; recognise and describe patterns and trends; use models in explanations; use data to make predictions; and communicate findings and reasoned conclusions.	Students will be aware of the terms 'rate of reaction, product, reactant, particles' They will be able to name signs that a chemical reaction has happened and the energy changes that happen during reactions.
Core Knowledge Organiser content	Formation of ions Ionic Bonding Ionic Compounds Covalent Bonding Simple molecular substances Polymers and Giant Covalent structure Allotropes of Carbon Metallic Bonding States of Matter Changing state Nanoparticles and use of nanoparticles	Relative formula mass The mole Conservation of mass The mole and equations Limiting Reagents Gases and solutions Concentration calculations Atom economy Percentage yield	Endothermic and Exothermic reactions Energy profiles Bond energies Cells and batteries Fuel cells	Acids and Bases Titrations Strong and Weak acids Reactions of acids	Rates of reaction Factors affecting rate of reaction Measuring rate of reaction Rates experiments Rate of reaction graphs Reversible reactions Le Chatelier's principle
Assessment Objectives	**AO1:** Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. **AO2:** Apply knowledge and understanding of: 1) scientific ideas **AO3:** Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	**AO1:** Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. **AO2:** Apply knowledge and understanding of: 1) scientific ideas **AO3:** Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	**AO1:** Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. **AO2:** Apply knowledge and understanding of: 1) scientific ideas **AO3:** Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	**AO1:** Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. **AO2:** Apply knowledge and understanding of: 1) scientific ideas **AO3:** Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	**AO1:** Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. **AO2:** Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. **AO3:** Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.
Vocabulary / Key Subject Terminology	Giant Lattice Ionic Bonding Covalent Bond Molecule Polymer Thermosoftening Polymer Delocalised	Relative Atomic Mass (RAM), Ar Relative Formula Mass, Mr Mole Avogadro Constant Conservation of Mass Thermal Decomposition Excess	Exothermic Reaction Endothermic Reaction Activation Energy Reaction Profile Bond Energy Covalent Bond Mole	Reactivity Series of Metals Oxidation Reduction Displacement Reaction Redox Reaction Ore Electrolysis	Activation Energy Enzymes Closed System Dynamic Equilibrium Le Chatelier's Principle Turbidity Catalyst

	Metallic Bonding Malleable Alloy States of Matter Nanoscience Nanoparticles Fullerenes	Limiting Reactant Yield Percentage Yield Atom Economy (Atom Utilisation) Pipette Burette End Point Concordant	Cell Battery Electrolyte Fuel Cell Anode Cathode	Electrolyte Discharge Anode Cathode Inert Electrodes	
Assessment 1	Teacher assessment: Extended written task	Teacher assessment: Extended written task	Teacher assessment: Required practical	Teacher assessment: Required practical	Teacher assessment: Required practical
Assessment 2	End of Unit test	End of unit test	End of unit test	End of unit test	End of Unit test
Cross Curricular Links with other Faculties	Maths-Plotting and interpreting data, DT-uses and development of materials Geography-Sustainability and recycling.	Maths-Plotting and interpreting data, algebraic formula, rearranging formulas. Calculator use and general numeracy.	Physics- Electricty, circuits Maths-Plotting and interpreting data. DT-Uses of elements/materials	Geography- Mining, environmental implications of extracting metals. History- Notable discoveries in science (electricity), Bronze age, Iron age. Maths-Plotting and interpreting data	History- Fritz Haber and use of gases in concentration camps. Biology- Use of enzymes in reactions. Food technology- Use of enzymes in food production and washing powder.
Extra-Curricular Offer	After school revision/STEM club/Outreach	After school revision/STEM club/Outreach	After school revision/STEM club/Outreach	After school revision/STEM club/Outreach	After school revision/STEM club/Outreach
Time Allocation	20 hours(Including assessment and feedback)	10 hours(Including assessment and feedback)	10 hours(Including assessment and feedback)	10 hours(Including assessment and feedback)	12 hours (including assessment and feedback)