Curriculum Rationale and Overview

Subject: Chemistry **Year group: 9**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum context	A simple (Dalton) atomic model Differences between atoms, elements and Chemical symbols and formulae for elements and compounds. Chemical reactions as the rearrangement of atoms The varying physical and chemical properties of different elements The principles underpinning the Mendeleev periodic table The periodic table: periods and groups; metals and non-metals	Biology and Physics taught in this term	Exothermic and endothermic chemical reactions (qualitative) Combustion, thermal decomposition, oxidation and displacement reactions Defining acids and alkalis in terms of neutralisation reactions Reactions of acids with metals to produce a salt plus hydrogen Reactions of acids with alkalis to produce a salt plus water What catalysts do	Biology and Physics taught in this term	Biology and Physics taught in this term	Changes of state of matter in terms of particle kinetics, energy transfers and the relative strength of chemical bonds and intermolecular forces Types of chemical bonding: ionic, covalent, and metallic Bulk properties of materials related to bonding and intermolecular forces Bonding of carbon leading to the vast array of natural and synthetic organic compounds that occur due to the ability of carbon to form families of similar compounds, chains and rings Structures, bonding and properties of diamond, graphite, fullerenes and graphene
Scheme of Learning Title:	Atomic Structure and Periodic Table		Chemical/Energy changes: Chemical Reactions			Bonding
Content *What will students know?*	The movement of particles in different states, including Brownian motion.		Define a reaction as endothermic or exothermic in terms of energy taken in/released. Common reactions and			The difference between the bonding including the elements involved and electron arrangements. Properties of ionic,

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	How the atomic model has changed over time. How the periodic table has changed over time The electronic structure of an atom. Introduction to bonding (covalent)		their products. Reactions are sped up using catalysts without being used up themselves. What the reactivity series is.			covalent and metallic bonding The difference between simple and giant covalent compounds
What will students understand?	Elements are ordered in groups with similar physical and chemical properties. The energy transfers that happen as states change. Mendeleev left gaps in the periodic table for elements that weren't discovered. He was able to predict the properties as they would fit the patterns of the groups. The atomic model has changed over time as discoveries were made. The mass is concentrated in the centre of the atom with electrons travelling around in shells. Most of the atom is empty space. Non-metals bond covalently. This is		Exothermic reactions release heat to the surroundings and endothermic take heat in. Oxidation reaction is the addition of oxygen to form oxide compounds. Combustion reactions produce CO2 and H2O Neutralisation reactions between an acid and alkali produce a salt and water. The reactivity series is a list of metals with varying reactivity and their reactions with water and acid help to order these.			How electrons are shared/transferred/delocalised in the different bonding types. How the bonding present affects the physical and chemical properties The difference between simple and giant covalent compounds. The difference between intermolecular forces and intramolecular bonds. Bonds are strong and require lots of energy to overcome and break substances.

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	shared electrons that require lots of energy to overcome.					
What will students be able to do?	Predict the properties of elements based on their position in the periodic table. Draw the electronic structures for the first 20 elements. Explain how the periodic table is arranged. Explain why simple covalent structures are gases at room temperature Draw dot and cross diagrams for simple covalent compounds		Test the reactivity of metals by using acids and state observations. Explain how the temperature of a reaction can determine whether it is an endothermic/exothermic reaction. Compare the rate of reactions with/without a catalyst			Draw dot and cross diagrams to illustrate ionic/covalent compounds Compare the properties of ionic/covalent compounds and the use of alloys. Explain how the bonding gives rise to the properties of substances.
How will they be formally assessed?	End of term test Describe the work of Mendeleev when creating the periodic table.		End of term test State whether reactions are endothermic or exothermic from changes in temperature.			End of term test Explain the relationship between the bonding in the molecule, the properties and the uses of the compound.