

Key Stage Five Curriculum – Carre’s Grammar School

Subject						
	Autumn 1	Autumn 2	Spring 3	Spring 4	Summer 5	Summer 6
Year 12	<p>Atomic structure</p> <ol style="list-style-type: none"> 1. Fundamental particles 2. Mass number, atomic number, isotopes. 3. Electron arrangement 4. The mass spectrometer 5. More electron arrangement 6. Electron arrangement and ionisation energy <p>Bonding</p> <ol style="list-style-type: none"> 1. Ionic bonding 2. Covalent bonding 3. Metallic bonding 4. Electronegativity – bond polarity in covalent bonds 5. Forces acting between molecules 6. Shapes of molecules and atoms 7. Bonding and physical properties 	<p>Amount of substance</p> <ol style="list-style-type: none"> 1. Relative atomic and molecular masses, the Avogadro constant and the mole 2. Moles in solution 3. The ideal gas equation 4. Empirical and molecular formulae 5. Balanced equations and related calculations 6. Balanced equations, atom economies and percentage yields <p>Energetics</p> <ol style="list-style-type: none"> 1. Exothermic and endothermic reactions 2. Enthalpy 3. Measuring enthalpy changes 4. Hess's law 5. Enthalpy changes of combustion 6. Representing thermochemical cycles 7. Bond enthalpies 	<p>Introduction to Organic chemistry</p> <ol style="list-style-type: none"> 1. Carbon compounds 2. Nomenclature 3. Isomerism <p>Alkanes</p> <ol style="list-style-type: none"> 1. Introduction 2. Fractional distillation of crude oil 3. Industrial cracking 4. Combustion of alkanes 5. The formation of halogenoalkanes <p>Kinetics</p> <ol style="list-style-type: none"> 1. Collision theory 2. The Maxwell-Boltzmann distribution 3. Catalysts <p>Equilibria</p> <ol style="list-style-type: none"> 1. The idea of equilibrium 2. changing the conditions of an equilibrium reaction 3. Equilibrium reactions in industry 4. The equilibrium constant, K_c 5. Calculations using equilibrium constant expressions 6. The effect of changing conditions on equilibria 	<p>Halogenoalkanes</p> <ol style="list-style-type: none"> 1. Introduction 2. Nucleophilic substitution reactions 3. Elimination reactions <p>Alkenes</p> <ol style="list-style-type: none"> 1. Introduction 2. Reactions of Alkenes 3. Addition polymers <p>Oxidation, reduction and redox reactions</p> <ol style="list-style-type: none"> 1. Oxidation and reduction 2. Oxidation states 3. Redox equations <p>Periodicity</p> <ol style="list-style-type: none"> 1. The Periodic table 2. Trends in the properties of period 3 3. More trends 4. Ionisation energies 	<p>Alcohols</p> <ol style="list-style-type: none"> 1. Introduction 2. Ethanol production 3. Reactions of alcohols <p>Organic analysis</p> <ol style="list-style-type: none"> 1. Test-tube reactions 2. Mass spectrometry 3. Infrared spectroscopy <p>Group 2, the Alkaline Earth Metals</p> <ol style="list-style-type: none"> 1. Physical and chemical properties of Group 2 <p>The Halogens</p> <ol style="list-style-type: none"> 1. Introduction 2. The chemical reactions of the Halogens 3. Reactions of halide ions 4. uses of chlorine 	<p>Practical skills</p> <p>Focus on core practical skills</p> <p>NMR introduction</p> <p>Introduction and research into Y13 topic area</p> <p>Research topic</p> <p>Polymers</p>
		<p>Assessment</p> <p>September – GCSE level assessment</p> <p>October – Progress test 1</p> <p>This test covers any topics taught to date</p> <p>December – End of term test. This test covers topics taught in Autumn 2</p>	<p>Assessment</p> <p>February – End of term test. This test covers topics taught in Spring 3.</p> <p>April- End of term test. This test covers topics taught in Spring 4.</p>		<p>Assessment</p> <p>May – End of term test. This test covers topics taught in Summer 5.</p> <p>End of year test – Covers any topics taught from Autumn 1 to Summer 5</p>	

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<h1>Year 13</h1>	<p><u>Structure determination</u></p> <ol style="list-style-type: none"> 1. Nuclear magnetic resonance spectroscopy 2. Proton NMR 3. Carbon NMR 4. Interpreting spectra 	<p><u>Amines</u></p> <ol style="list-style-type: none"> 1. Introduction 2. Properties of amines as bases 3. Amines as nucleophiles and their synthesis 	<p><u>Equilibrium constant K_p</u></p> <ol style="list-style-type: none"> 1. Equilibrium constant, K_p, for homogeneous systems 	<p><u>The transition metals</u></p> <ol style="list-style-type: none"> 1. General properties of transition metals 2. Complex formation and shapes of complex ions 3. Coloured ions 4. Variable oxidation states of transition elements 5. Catalysts 	<p><u>Revision</u></p> <ol style="list-style-type: none"> 1. Paper 3 core practicals revision. 2. Structured past paper revision.
	<p><u>Nomenclature and isomerism</u></p> <ol style="list-style-type: none"> 1. Naming organic compounds 2. Reactions of the carbonyl group in aldehydes and ketones 3. Synthesis of optically active compounds 	<p><u>Aromatic chemistry</u></p> <ol style="list-style-type: none"> 1. Introduction 2. Arenes – physical properties, naming and reactivity 3. Reactions of arenes 	<p><u>Acids bases and buffers</u></p> <ol style="list-style-type: none"> 1. Defining an acid 2. The pH scale 3. Weak acids and bases 4. Acid-base titrations 5. Choice of indicators for titrations 6. Buffer solutions 	<p><u>Periodicity</u></p> <ol style="list-style-type: none"> 1. Reactions of Period 3 elements 2. The oxides of elements in Period 3 3. The acidic / basic nature of Period 3 oxides 	<p><u>Reactions of inorganic compounds in aqueous solutions</u></p> <ol style="list-style-type: none"> 1. The acid-base chemistry of aqueous transition metal ions 2. Ligand substitution reactions 3. Summary of acid-base substitution reactions of selected metal ions.
<p><u>Compounds containing the carbonyl group</u></p> <ol style="list-style-type: none"> 1. Introduction to aldehydes and ketones 2. Reactions of the carbonyl group in aldehydes and ketones 3. Carboxylic acids and esters 4. Reactions of carboxylic acids and esters 5. Acylation 	<p><u>Polymerisation</u></p> <ol style="list-style-type: none"> 1. Condensation polymers 	<p><u>Organic synthesis and analysis</u></p> <ol style="list-style-type: none"> 1. Synthetic routes 2. Organic analysis 	<p><u>Chromatography</u></p> <ol style="list-style-type: none"> 1. Chromatography 		
<p><u>Thermodynamics</u></p> <ol style="list-style-type: none"> 1. Enthalpy change 2. Born-Haber cycles 3. More enthalpy changes 4. Why do chemistry reactions take place? 	<p><u>Amino acids, proteins and DNA</u></p> <ol style="list-style-type: none"> 1. Introduction to amino acids 2. Peptides, polypeptides and proteins 3. Enzymes 4. DNA 5. The action of anti-cancer drugs 	<p><u>Electrode potentials and electrochemical cells</u></p> <ol style="list-style-type: none"> 1. The electrochemical series 2. Predicting the direction of redox reactions 3. Electrochemical cells 			
<p><u>Kinetics</u></p> <ol style="list-style-type: none"> 1. The rate of a chemical reaction 2. The rate expression and order of reaction 3. Determining the rate equation 4. The rate determining step 					
<p>Assessment</p> <p>October – End of term test. This test covers topics taught in Y12.</p> <p>December – End of term test. This test covers topics taught in Autumn 2</p>		<p>Assessment</p> <p>February – End of term test. This test covers topics All Y12 and Y13 topics to date.</p> <p>April- End of term test. This test covers topics taught in Spring 4.</p>			

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