**CURRICULUM PLAN: 2020 – 2021 (Autumn 1) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2 (HLA)** | **Friday 5&6** |
| **Week 1**  W/C 7th Sept | Introductory lesson | Title: All about atoms  Lesson Objectives:   * To know the idea of relative atomic mass and theories of atoms * To understand how a mass spectrometer is used to determine RAM * To be able to justify the stages of TOF and explain their impact on results | Title: molecules  Lesson Objectives:   * To Know the different between mono-atomic, diatomic and simple molecules and how their TOF spectra * To understand how isotopes effect the spectra of diatomic and molecule TOF * To be able to work out isotopic abundance from TOF spectra for diatomic elements |
| **Week 2**  W/C 14th Sept | Title: Avogadros moles  Lesson Objectives:   * To know the meaning of avogadros number and moles * To understand how to use equations to relate mass, volume and concentration to moles * To be able to justify the steps of preparing a standard solution | Title: electronic structure  Lesson Objectives:   * To Know the S, P, D orbitals and forms of representing atomic configuration * To understand why electrons fill shells in a particular order and the exceptions for transition metals * To be able to complete configurations in different forms for a range of atoms and ions | Title: Ionisation  Lesson Objectives:   * To Know the factors that affect ionisation and how to write equations for the process * To understand the different trends in ionisation (successive, down group across period * To be able to identity atoms from data on successive ionisation and explain trends |
| **Week 3**  W/C 21st Sept | Title: It’s all a bit excessive  Lesson Objectives:   * To know the how to balance equations * To understand how to identify and use the concepts of excess * To be able to solve molar problems using a problem solving method | Title: Titration Practice  Lesson Objectives:   * To know the steps of a titration and it’s purpose * To understand the means of reducing error and how to calculate percentage error * To be able to conduct a simple titration under observation | Title: Formula, unit and yield:  • To know the meaning of density, empirical formula, percentage composition, yield and atom economy  • To understand how use these concepts to manipulate equations and data  • To be able to determine the empirical formula of a hydrated crystal |

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| **Week 4**  W/C 28th Sept | Title: Ideal gas equation   * To know the terms and units of the ideal gas equation * To understand the operation of the equation and how it relates to chemical equations involving gases   To be able to solve exam style questions  Revision and homework checking | PC1 Assessment | Title: Metallic and Ionic bonding   * To Know the charges of common monoatomic / compound ions and the definitions of metallic and ionic structures * To understand how the physical properties of metallic and ionic compounds arise from their bonding * To be able to explain differences in properties with reference to the charges and sizes of ions. |
| **Week 5**  W/C 5th Oct | Title: Covalent bonds  Lesson Objectives:   * To Know the meaning of the terms covalent, dative covalent, molecule and macromolecule (to include both diamond and graphite) * To understand the VESPR model gives rise to different molecular shapes * To be able to predict the bond angles and shapes of simple molecules | Title: More on shapes (mastery  Lesson Objectives:   * To Know the names and bond angles of different shapes * To understand that VESPR gives rise to molecular shapes * To be able to explain the shapes of key compounds with double bonds | PC1 feedback |
| **Week 6**  W/C 12th Oct | Title: Intermolecular forces  Lesson Objectives:  • To Know that all molecules have VdW forces  • To understand how vdw forces arise (charge clouds)  • To be able ….. | Title: Polarity  Lesson Objectives:  • To Know that bonds are polar or non-polar and this affects their properties (water burettes experiment)  • To understand how electronegativity gives rise to polarity and symmetry to the dipole moment  • To be able to show how the existence of dipoles affects the properties of materials | Inset day |
| **Week 7**  W/C 19th Oct | Title: Intermolecular forces  Lesson Objectives:  • To Know that the cause and effect of electronegativity  • To understand how pd.pd and hydrogen bonds arise  • To be able to explain properties in terms of intermolecular forces and the exceptional properties of H-bonds | Title: Periodicity  Lesson Objectives:  • To Know the structure of the periodic table and how it relates to atomic properties  • To understand how melting points vary across a period  • To be able to answer exam style questions on bonding (bonding “extension pack” | PSA 1 pt 1 & 2) |



**CURRICULUM PLAN: 2020 – 2021 (Autumn 2) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2** | **Friday 5&6** |
| **Week 1**  W/C 2nd Nov | **Section test bonding + homework checking** | PSA 1 pt 1 & 2) attempt two | Title: Enthalpy change  Lesson Objectives:   * To Know how exo and endothermic changes are measured in terms of enthalpy change under standard conditions * To understand how an enthalpy profile diagram shows the activation energy and change in terms of making and breaking bonds and the meaning of the term mean bond enthalpy * To be able to work out energy changes using mean bond enthalpies and explain why they may differ from experimental values |
| **Week 2**  W/C 9th Nov | Title: Hess’ law  Lesson Objectives:   * To Know what hess’s law states and the meaning of meaning of enthalpy of combustion, formation and reaction * To understand how to work out an enthalpy of reaction from data (either combustion or formation * To be able to solve exam style questions using these theoretical methods | Title: measuring an enthalpy change  Lesson Objectives:   * To Know the different between temperature and heat * To understand how to measure the temperature change for a simple reaction and how we use equations to determine the enthalpy change * To be able to use and justify a method for calculating the enthalpy change for a reaction | Title: Energetics  Lesson Objectives:  • To Know the rules for working out enthalpies from combustion, formation or bond enthalpies  • To understand how that questions can combine data from all three  • To be able to solve a range of exam style questions |
| **Week 3**  W/C 16th Nov | Homework checking and mastery on energetics | Section test energetics | Inset day |
| **Week 4**  W/C 23rd Nov | Energetics feedback | Title: Le Chat’s equilibrium  Lesson Objectives:  • To Know what a reversible reaction and dynamic equilibrium are  • To understand how Le Chatilier’s principle predicts shifts in an equilibrium  • To be able to explain the use of compromise conditions in industry | Title: Equilibrium maths  Lesson Objectives:   * To Know that equilibrium can be expressed as a fraction with a Kc value * To understand how to work out Kc and why only temperature effect it * To be able to work out Kc for a mixture or for a reaction establishing an equilibrium |
| **Week 5**  W/C 30th Nov | Title Equilibrium practice  • To know the table for working out change in Kc  • To understand how to use it scenarios  • To be able to tackle problems relating to Kc | Title: REDOX  Lesson Objectives:   * To Know the rules for REDOX and oxidation states in terms of electron transfer * To understand how to construct half and full redox equations * To be able to resolve complex equations by determining half equations | Title: Group two (No lesson on drive ESV taught last year)  Lesson Objectives:   * To Know the basic properties and reactions of group two metals and the solubility rules of their products * To understand the use of group two compounds in barium meals, neutralisation reactions and the extraction of titanium * To be able to carry out and explain (including acidification) the sulphate test using ionic equations |
| **Week 6**  W/C 7th Dec | Title: Group seven  Lesson Objectives:   * To Know the tests for aq halides and their displacement reactions * To understand the trends in the reaction of halogens and halides in terms of their oxidising or reducing ability * To be able to construct equations for the tests for solid halides | Title Chlorine:   * To know the three reactions of chlorine * To understand the term disproportionation * To be able to assess the benefits and risks of chlorinating water   Separate element: carrying out simple chemical tests | Section test group 2/7 |
| **Week 7**  W/C 14th Dec | Section test group 2/7 feedback | Walking talking mock on paper one |  |

**CURRICULUM PLAN: 2020 – 2021 (Spring 1) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2 (HLA)** | **Friday 5&6** |
| **Week 1**  W/C 4th Jan | PC2 revision | PC2 Revision | Title: Basics of organic chemistry  Lesson Objectives:  • To Know the IUPAC names for AS compounds and naming rules  • To understand how to name different compounds from display formula  • To be able to draw structural formula from names and vice versa |
| **Week 2**  W/C 11th Jan | Section test equilibria | Title: functional groups  Lesson Objectives:  • To Know the names and chemical test for the different functional groups  • To understand that functional groups affect chemical properties and changes in a homologous series affect physical properties  • To be able to identify partial charges and the nature of intermolecular forces between molecules | Title: Structural isomers  Lesson Objectives:   * To Know the different types of formula * To understand the different forms of structural isomerism that can exist   To be able to draw display formulas and name different structural isomers |
| **Week 3**  W/C 18st Jan | Title stereoisomerism  Lesson Objectives:  • To know that double bonds have fixed bond angles and restricted rotation  • To understand the rules for naming E-Z isomers  • To be able to complete a range of exam style questions | Title: Isomers mastery (ESV taught – no lesson on drive)  Lesson Objectives:  • To Know the IUPAC rules for naming  • To understand how to draw skeletal and structural formula  • To be able to determine all the structural isomers of given compounds and identify the types of isomers between pairs | PC2 feedback |
| **Week 4**  W/C 25th Jan | Equilibria feedback | Title: Alkanes  Lesson Objectives:  • To Know Alkanes are saturated and have different boiling points and how they are separated and cracked  • To understand how construct equations for combustion and the problems of sulphur  • To be able to explain the workings effects of an internal combustion engine and how catalytic converters work | Title: Production of Halogen alkanes  Lesson Objectives:   * To Know the steps in the mechanism to make chloro methane * To understand the synthesis of choloalkanes works giving examples   To be able to explain why CFC’s were banned |
| **Week 5**  W/C 1st Feb | Title: Halogenalkanes  Lesson Objectives:   * To Know the mechanism of a nucleophilic substitution reaction * To understand how to draw mechanisms for the three main nucleophiles * To be able to explain how the rate of reaction is determined and the chemical test for halogen alkanes | Section test – intro to organic | Title: Halogenalkanes  Lesson Objectives:   * To Know the mechanism of a nucleophilic substitution reaction * To understand how to draw mechanisms for the three main nucleophiles * To be able to explain how the rate of reaction is determined and the chemical test for halogen alkanes |
| **Week 6**  W/C 8th Feb | Intro to organic feedback and revision | PC3 classroom assessment | Title: Elimination  Lesson Objectives:   * To Know the mechanism for elimination * To understand why and when OH acts a nucleophile or a base * To be able to complete exam style questions |



**CURRICULUM PLAN: 2020 – 2021 (Spring 2) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2** | **Friday 5&6** |
| **Week 1**  W/C 22nd Feb | PC3 revision | PC3 revision | PC3 feedback |
| **Week 2**  W/C 1st Mar | Title: Electrophilic addition  Lesson Objectives:  • To Know the mechanism for electrophilic addition  • To understand how to draw mechanisms for each of the electrophiles  • To be able to explain the existence of major and minor products | Polymers  Lesson Objectives:  • To Know the process on addition polymerisation inc drawing repeating units, monomers  • To understand how the properties of polymers can be changed by plasticisers (eg PVC)  • To be able to explain the properties of polymers in terms of intermolecular forces  (practical activity – ESV) | Title: Producing Alcohol  Lesson Objectives:   * To Know the comparison for the two means of producing * To understand and describe the mechanism and conditions of the two forms of production * To be able to evaluate the statement ethanol is a carbon neutral biofuel |
| **Week 3**  W/C 8th Mar | Oxidising alcohols  Lesson Objectives:   * To Know the oxidations paths for classes of alcohol and the test for aldehydes and ketones * To understand why aldehydes must be produced by distillation * To be able to explain the distillation of an aldehyde in terms of intermolecular forces | Section test Alkanes and Haloalkanes | PC3 feedback |
| **Week 4**  W/C 15th Mar | Reflux and distillation  To know how to reflux and distil a primary alcohol  To understand why the practical set up determines the product  To be able to carry out a reflux and distillation | Title: Fast and furious  Lesson Objectives:   * To Know what rate of reaction is and what factors affect it * To understand what a Maxwell Boltzmann distribution shows * To be able to explain the impact of temperature with reference to a Maxwell-Boltzmann distribution | Section test feedback |
| **Week 5**  W/C 22nd Mar | Title: Organic Analysis  Lesson Objectives:   * To Know the different organic tests * To understand how bonds absorb IR radiation and how this produces distinctive spectra and global warming * To be able to explain when high res mass spec or IR fingerprints maybe needed | PC4 revision | PC4 assessment in class |
| **Week 6**  W/C 29th Mar | PSA – distillation of a product of a reaction | Feedback |  |

**CURRICULUM PLAN: 2020 – 2021 (Summer 1) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2** | **Friday 5&6** |
| **Week 1**  W/C 19th Apr | Section test alkenes and alcohols | PSA investigation of how rate changes with temperature | Practice packs |
| **Week 2**  W/C 26th Apr | **Practice packs** | Section test feedback | Practice packs |
| **Week 3**  W/C 3rd May | Practice packs | Revision and PSA – planning and carrying out a set of reactions to determine unknown organic reagents | Practice packs |
| **Week 4**  W/C 10th May | Practice packs |  | Practice packs |
| **Week 5**  W/C 17th May | **Provisionally this is AS paper one** |  |  |
| **Week 6**  W/C 24th May |  | **Provisionally this is AS Paper two** |  |

**CURRICULUM PLAN: 2020 – 2021 (Summer 2) Chemistry AS**

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|  | **Tuesday P3&4** | **Wednesday 1&2** | **Friday 5&6** |
| **Week 1**  W/C 7th June |  |  |  |
| **Week 2**  W/C 14th Jun |  |  |  |
| **Week 3**  W/C 21st Jun |  |  |  |
| **Week 4**  W/C 28nd Jun |  |  |  |
| **Week 5**  W/C 5th july |  |  |  |
| **Week 6**  W/C 12th Jul |  |  |  |
| **Week 7**  W/C 19th Jul |  |  |  |