Year 12

Calendar	Big Question/Theme	Small Questions	Assessment Opportunities and Criteria. Teacher feedback point (TFP)	Homework
Autumn 1 Year 12 Topic Module 2.5 2.6	Why do things react together and bond?	1-How do we write out the electronic configuration of an element? 2-What are electron orbitals? 3-How do metals and non-metals bond together? 4-What are the properties of ionic compounds? 5-What is a covalent bond? 6-How can we represent them using dot and cross diagrams? 7-What is average bond enthalpy? 8-Why are molecules certain shapes? 9-What are the names of the different shapes of molecules? 10-How do you explain the angles in the different shapes? 11-What is electronegativity? 12-What is a dipole? 13-What is a polar molecule? 14-What are the different types of IMF? 15-What are the properties of the different IMF?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn 1 Year 12 Topic Module 2.2 2.3	What is everything made up of?	What is the structure of an atom? What are isotopes? What does the atomic number and atomic mass number tell us? How has the “structure” of the atom changed over time? What evidence is there to support the structure of the atom? What is mass spectre? How can you use mass spectre to calculate the relative atomic mass of an element? How do you calculate moles? How do you calculate number of particles? How do you calculate volumes of gases? What is the ideal gas equation? How can you calculate the concentration of a substance? How do you balance an equation? How do you construct an ionic equation? How do you write ionic formulas How do you calculate % yield? How do you calculate the atom economy? Why is it important to have a high atom economy?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn/ Winter Year 12 Topic Module 2.4	How are chemical reactions different and how do we use calculations to predict them?	What makes an acid an acid and a base a base? How do acids react with metals, bases and carbonates? What is a titration? What is a standard solution? How do you make a standard solution and perform a titration? How do you do titration calculations? What is an oxidation number? How do you write formulas using oxidation states? What is oxidation and reduction? How do you interpret redox equations?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn/ Winter Year 12 Topic Module 3.7	How is an elements place on the periodic table linked to its properties?	How were elements ordered in early periodic tables? How does todays periodic table link to the electronic configuration? What is ionisation energy? What is the trend in first ionisation energy across period 2 and 3? What is a successive ionisation energy? How do you predict the energy involved for a successive ionisation? How can the bonding and structure explain the properties of diamond, graphite and graphene? What are the uses of diamond, graphite and graphene? What is the bonding and structure in metals? What are the properties of metals? How does the boiling point change across a period? Why does the boiling point change across a period?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Winter/ Spring Year 12 Topic Module 3.8	How is an elements place on the periodic table linked to its properties?	What are the properties of group 2 elements? What are the uses of group 2 elements? What is the trend in boiling point down group 7? What is the trend in reactivity and how can this be explained? What is disproportionation? How is bleach made? How does chlorine react with water? How can you test for chloride ions, bromide ions, iodide ions, sulfate ions, carbonate ions and ammonium ions?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Winter/ Spring Year 12 Topic Module 3.9	Why is rate of reaction and position of equilibrium important for reactions?	What is an enthalpy change? What are energy profile diagrams? What are exothermic and endothermic reactions? How do you calculate the bond enthalpy? How do you measure the enthalpy change? How do you calculate the enthalpy change via practical data? What is Hess's Law? How do you calculate the enthalpy of Combustion? How do you calculate the enthalpy of Formation?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Spring Year 12 Topic Module 3.10	Why is rate of reaction and position of equilibrium important for reactions?	What is a Maxwell Boltzmann curve? How does the curve change with Temperature? How does the curve change with concentration? What is the role of a catalyst? How does a catalyst work? What is a heterogeneous and homogeneous catalyst? What is the rate of reaction? How can you measure the rate of reaction through practical work? How do you calculate the rate of reaction from the gradient of a graph? What is meant by dynamic equilibrium How do changes in temperature, pressure and concentration affect the equilibrium position? How do you write Kc equations? How do you calculate Kc?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

Calendar	Big Question/Theme	Small Questions	Assessment Opportunities and Criteria. Teacher feedback point (TFP)	Homework
Spring Year 12 Topic Module 4 Chapter 11, 12, 13	What is organic chemistry?	What is a functional group? What are general, structural, molecular, displayed, skeletal and empirical formulas? What is an aromatic compound? What are aliphatic compounds? What are alicyclic compounds? What are structural isomers? What are alkenes and alkanes? How do you name organic compounds using IUPAC? What are the chemical and physical properties of alkanes? What are the dangers of carbon monoxide? What is heterolytic and homolytic fission? What are free radicals? How do you write reaction mechanisms? What is free radical substitution? What is the structure of a carbon-carbon double bond? What are E/Z stereoisomers? How do you use the Cahn-Ingold-Prelog? What is an electrophile? What is an electrophilic addition mechanism? How do you use Markownikoff's rule? What are addition polymers? How do you draw repeating units? Why are biodegradable and photodegradable polymers useful?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Summer/ Spring Year 12 Topic Module 4 Chapter 14,15	Why are alcohols and haloalkanes important molecules?	What are the properties of alcohols? How do you classify alcohols? What are substitution reactions? What are elimination reactions? How are alcohols oxidised? Can primary, secondary and tertiary alcohols be oxidised? What products are formed in the oxidation of alcohols? What are haloalkanes? What is a nucleophilic substitution reaction? What is the hydrolysis of haloalkanes? How does the rate of hydrolysis change with bond strength? How are radicals produced in the upper atmosphere? How can radicals breakdown the ozone layer? Which gases absorb infrared radiation? What is global warming?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Summer Year 12 Topic Module 4 Chapter 16	Why is quantitative analysis in Chemistry important?	How do you use the infrared spectrum to identify an organic compound and different functional groups? How do you analyse a mass spectrum? What is the molecular ion peak? How can you use elemental analysis, infrared spectrum and mass spectrum? How do you use quickfit apparatus? How do you prepare and purify an organic liquid? What are synthetic routes?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

Year 13

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Autumn 1 Year 13 Topic Module 5.18	How can different factors affect the speed of a reaction?	How do we determine the rate constant for a first order reaction from the gradient of a rate- concentration graph? How are rate-concentration graphs created? How are clock reactions used to determine initial rates of reactions? How do you monitor reaction rates? What is half life and first order reactions? How do you determine the rate constant from half lives? What is the rate determining step? How do you predict a rate equation that is consistent with the rate-determining step? How do you use the rate equation to predict steps in a mechanism? What effect does temperature have on the rate of reaction and rate constant? What is the Arrhenius equation? How do you determine activation energy from the Arrhenius equation?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn 1 Year 13 Topic Module 5.19	How does concentration have an effect on a reaction?	How do you write a Kc equation for heterogeneous and homogeneous reactions? How do you calculate Kc? What is partial pressure? What is a mole fraction? How do you calculate Kp? How does Kc change with concentration, pressure and catalyst? How does the equilibrium change with temperature?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn 2 Year 13 Topic Module 5.20 5.21	What is pH and how can it be calculated?	What is a Bronsted Lowry acid and base? What is a conjugate acid/base pair? What is the role of H+ in different reactions? How do you calculate pH? How do you calculate concentration from pH? What is the expression for Kw? How does equilibrium effect Kw? How do you calculate the pH of a strong base? How do you write out Ka equations? How do you calculate Ka? What is the acid dissociation constant? How do you calculate the pH of a buffer solution? How is blood pH controlled by a buffer system? How do you use a pH meter during a titration? How do you draw a pH curve? How can you select an appropriate indicator for a titration?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn 1 Year 13 Topic Module 5.22	What energy changes take place during reactions?	What definitions are needed for the energetics topic? What is lattice enthalpy? How does the ionic charge and radius affect lattice enthalpy? How do you construct a born Haber cycle? What is the enthalpy of solution and hydration? How do you calculate the enthalpy of solution and hydration? What is entropy? How do you calculate entropy? How do you calculate free gigs energy? How can you use the value to calculate the feasibility of a reaction?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Winter Year 13 Topic Module 5.23	What are the uses of redox reactions?	What is oxidation and reduction? How do you write redox equations? What are electrochemical cells? What are electrode potentials? How do you carry out a redox titration? How do you carry out titration calculations? How do you measure the electrode potential using the standard hydrogen electrode? How do you measure a cell potential? How do you predict feasibility of a reaction using standard potentials? How do you apply principles of electrode potentials to modern storage cells? What are the benefits and risks of electrochemical cells?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Spring 1 Year 13 Topic Module 5.24	What is a transition metal?	What is the definition of a Transition metal? How do you write the electronic configuration of Transition elements? What properties do Transition metals possess? How do Transition metals behave? What is a complex ion? What is a ligand? How do ligands determine the shape of a complex ion? Why do complex ions show isomerism? How does Cis Platin work as an anti-cancer drug? What is ligand substitution? How does ligand substitution affect the complex? How do Transition metal ions react with sodium hydroxide and aqueous ammonia? What do these reactions look like? How do transition metal ions react during redox reactions? What are the colour changes for these reactions? How can you test for chloride ions,	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Autumn 2 Year 13 Topic Module 6.25	Can you describe the structure and reactions of Benzene?	What is Kekule model for benzene? How do you name aromatic compounds? Can you recognise different functional groups associated with Benzene? Can you name aromatic compounds with one substitution? Can you name aromatic compounds where more than one hydrogen has undergone a substitution reaction? What is the reaction of benzene and alkenes with bromine? What is the acidity of phenol? Can you state some properties of phenols? Can you describe the reactions of phenol and alkalis? Can you explain how phenol undergoes electrophilic substitution reactions?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Winter Year 13 Topic Module 6.27	Can you explain the chemistry of Amines?	Can you describe the use of acyl chlorides in the synthesis of amines? Can you write equations for the preparation of amines? Can you understand the reactions of the carboxylic acid group and amine groups in amino acids? What are primary and secondary amines? What is optical isomerism and chirality? How do condensation polymers form polyesters and polyamides? How does the amine and ester group undergo hydrolysis in polymers? Can you identify repeating units and monomers from addition and condensation polymers?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Spring Year 13 Topic Module 6.28	What is organic synthesis and how is it used in synthetic routes?	What is the use of the C-C bond formation in synthesis to increase the length of a carbon chain? How are nitriles formed? What is the alkylation and acylation of benzene? How do you use the Quickfit apparatus? How are organic solids purified? Can you identify functional groups in organic molecules? Can you predict the reactions of organic molecules? What are multi-stage synthetic routes?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.

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Spring Year 13 Topic Module 6.29	What is the importance or chromatography, qualitative analysis and spectroscopy?	What is TLC chromatography? What is gas chromatography? How do you use test tube reactions to identify functional groups? What is NMR spectroscopy? What is the use of TMS? What is the role of deuterated solvents in NMR? What is proton NMR spectroscopy? What are proton environments? What is spin-spin splitting? Can you identify different protons form NMR? Can you analyse proton NMR spectra? Can you predict possible structures for molecules? Can you predict Carbon 13 or Proton NMR spectrum for given molecules? Can you deduce structures of organic compounds?	Each Module consists of testing phases within the lessons using past exam questions for each submodule. Exam questions are obtained from Exam Builder OCR. Teacher will mark exam questions and provide a class feedback sheet at the end of each topic. Student results will be recorded on a tracking sheet.	Homework is 40-50 marks of past exam questions/completion of work booklets. Students homework is marked by teacher of self assessment.