

Chapelton Academy Y13 Curriculum Intent Plan

Subject: Chemistry

Procedural knowledge (exam technique, skills etc):

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|---|--------------------------------|-------------------------------|
| a. 3D modelling | e. Decoding exam language | i. Setting up apparatus |
| b. Calculations and using equations | f. Revision Techniques | j. Task collaboration |
| c. Drawing line graphs from data | g. Managing time limited tasks | k. Exam error/Problem solving |
| d. Interpreting data from graphs & tables | h. Drawing apparatus | l. Drawing structures |

3.1.1 – Atomic Structure

3.1.2 – Amount of substance

3.1.3 – Bonding

3.1.4 – Energetics

3.1.5 – Kinetics

3.1.6 – Equilibria

3.1.7 – REDOX

3.1.8 – Thermodynamics

3.1.9 – Rate equations

3.1.10 – K_p

3.1.11 – Electrode potentials and cells

3.1.12 – Acids & bases

3.2.1 - Periodicity

3.2.2 – Group 2

3.2.3 – Group 7

3.2.4 – Period 3 & their oxides

3.2.5 – Transition metals

3.2.6 – Reactions of aqueous ions

3.3.1 – Intro to Organic Chemistry

3.3.2 – Alkanes

3.3.3 – Halogenoalkanes

3.3.4 – Alkenes

3.3.5 – Alcohols

3.3.6 – Organic Analysis

3.3.7 – Optical Isomerism

3.3.8 – Aldehydes & Ketones

3.3.9 – Carboxylic acids & derivatives

3.3.10 – Aromatic Chemistry

3.3.11 – Amines

3.3.12 – Polymers

3.3.13 – Amino acids, DNA & proteins

3.3.14 – Organic Synthesis

3.1.15 – NMR

3.3.16 - Chromatography

No of lessons	Disciplinary Knowledge sequence	Disciplinary knowledge, that this interleaves with	Procedural knowledge progression	RS revision knowledge topic	HW focus and actions	Assessment (topic and skills assessed)
5	3.3.10 – Aromatic Chemistry Structure & bonding of benzene ring Thermochemical evidence to support structure Substitution reactions of benzene	3.1.1 3.1.3 3.1.4 3.1.8 3.3.1	a, b, d, l	3.3.1 pyr 3.3.10 pyr e,f	Exampro questions on benzene structure and reactions to identify misconceptions	a,b,d,e,k
10	3.3.8 & 3.3.9– Carbonyl Chemistry Structures & bonding Reactions of carbonyls Addition reactions of aldehydes & ketones	3.1.3 3.3.5 3.3.6 3.3.7 3.3.12	a,e,h,k,l	3.3.5 pyr 3.3.8 pyr 3.3.9 pyr e,f	Exam questions on carbonyl chemistry (mechanisms) Interleaved questions on forming aldehydes & ketones	h,i,k,l
2	3.3.7 – Optical Isomerism Definitions and identification of asymmetric carbons Effect of stereoisomers	3.3.1 3.3.6 3.3.13 3.3.14	a,e,k,l	3.3.7 pyr e,f	Exam questions on isomerism with interleaving to other forms Identify misconceptions	e,k
5	3.3.11 – Amines Structure & bonding Reactions as nucleophiles Strength as bases	3.1.3 3.3.1 3.3.3 3.3.10 3.3.12 3.3.13 3.3.14	a,e,g,k,l	3.3.11 pyr 3.3.3 pyr	Exam questions incorporating 3-D structure Interleaved questions on aromatic amines Interleaved questions with halogenoalkanes	a,e,g,l
4	3.3.14 – Organic Synthesis Preparation of chemicals via multi step synthetic routes Recall of reagents and conditions	3.1.2 3.1.3 3.3.1-6 3.3.7-3.3.11	f,g,j,k,l	Synthetic pathways (ali & aro)	Exam questions on multi step synthesis Interleaved with any other organic topic	a,e,g,l
2	Required Practical 10 – Synthesis and purification of an organic liquid or solid Produce a sample of aspirin & test purity or prepare and purify a sample of hexene	3.3.1 3.3.3 3.3.5 3.3.6 3.3.10	b,h,l,j,k,l,	Practical pyr	Completing of lab book write up and questions Exam questions on practical techniques	e,g,h,k,l

3	3.3.12 - Polymers Definitions, drawing monomers & repeating units Formation of polyesters & polyamides & uses Biodegradability & disposal	3.1.3 3.3.1 3.3.4 3.3.11 3.3.13	e,g,i,j,k,l	Polymers pyramid	Exam questions on polymers, with interleaved questions from 3.3.4 on addition polymers	e,f,k,l
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3	3.3.13 – Amino acids, proteins & DNA Structure, zwitterions and properties Bonding in proteins & drawing structures Strength of bonding in proteins Enzymes (catalyst, stereospecificity, drug design) Structures & definitions of components of DNA Bonding in DNA Anticancer drugs	3.1.3 3.3.1 3.3.7 3.3.9 3.3.11 3.3.12 3.3.16	a,e,k,l	DNA pyramid	Exam questions highlighting exam language to focus on question techniques Interleaved questions on bonding and strength of IMF	e,f,g,j,k,l
5	3.1.15 – NMR Use as an analytical technique Identification of different H environments Explain use of TMS & deuterated solvents Using given data to deduce structures	3.1.3 3.3.1 – 3.3.6 3.3.7 – 3.3.14	a,d,e,g,j,k,l	NMR pyramid	Exam questions where NMR is used as a technique to identify a compound, interleaved with other analytical techniques from 3.3.6	d,j,k,l,f,g
2	3.3.16 – Chromatography Different types of chromatography Definitions & calculations of R _f Identification of substances	3.1.1 3.1.2 3.1.3 3.1.6 3.3.13 3.3.14	b,d,l,k	Chromatography pyramid	Exam questions interleaved with other analytical techniques and topics	e,f,g,k,l
2	Required Practical 12 – TLC Set up and carry out a practical to identify the prescription drugs present in an unknown sample.	3.3.16	b,g,l,j,k	Practical pyramid	Complete lab write up, answering questions and identifying the unknown substance	b, d, g, j, k
	Revision Sessions for Y13 mocks Use all revision materials produced so far in RS More exam questions to deepen understanding				Paper 2 exam questions, highlighting use of 3.1 Physical Chemistry knowledge	
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3.1.8 – Thermodynamics Y12 & Y13 definitions Born-Haber Cycles Gibbs Free Energy & Entropy	3.1.1 3.1.2 3.1.3 3.1.4	b,c,d,e,g,k	Energetics pyr Thermodynamics pyr	Exam questions on topic, interleaved with Y12 energetics questions Low stakes quizzes on definitions	b,c,d,e,f,g,k
3.1.9 – Rate Equations Order of reaction & rate equations Arrhenius equation (normal form) Arrhenius equation (ln form) and graphical analysis Determination of rate equation	3.1.5 3.1.6 3.1.10 3.1.12	b,c,d,e,g,k	Rate Pyramid	Exam questions on finding rate constants and using them to determine order. Interleaved with 3.1.5 (factors affecting rate or reaction)	b,c,d,e,f,k
Required Practical 7a & 7b Finding the order of reaction through; a) Initial rate method (iodine clock) b) Continuous method (Mg + HCl & H ₂ measurement)	3.1.2 3.1.5 3.1.9	b,c,d,e,i,j		Complete practical write up and associated questions. Draw graphs and identify misconceptions	b,c,d,e,f,g,i,k
3.1.10 – K_p Deriving PP from mole fraction & total pressure Forming K _p expressions Predicting how external factors affect K _p Effect of a catalyst on K _p	3.1.2 3.1.4 3.1.5 3.1.12 3.3.1	b,d,e,g,k	K _p pyramid Recap K _c	Exam questions on K _p calculations, interleaving K _c questions, with other 3.1.2 aspects included	d,e,f,g,k
3.1.11 – Electrode Potentials & Electrochemical Cells Writing half cells (IUPAC convention) SHE & definitions Using E values to predict reactions & calculating EMF Applications of electrochemical cells & advantages & disadvantages	3.1.1 3.1.3 3.1.7 3.2.1 3.2.5	b,h,k,l	Electro pyr	Exam questions, interleaved with REDOX questions to identify misconceptions and identify gaps	b,e,g,h,k,l
Required Practical 8 – Measuring the EMF of a cell Measure EMF for a given cell and then produce a table of many cells. Predict best combination to provide biggest EMF	3.1.1 3.1.3 3.1.11	b,d,e,g,h,i,j,k	Electro pyr	Lab book write up, to include answering associated exam style questions	b,d,e,g,h,i,j,k
3.1.12 – Acids & Bases Definitions Determination of pH K _w – definition, use of equation & effect of temperature K _a – definition, expression and calculations pH curves & indicators (from titrations) Buffers – definition, applications, calculations	3.1.2 3.1.3 3.1.6 3.1.10 3.3.1 3.3.9	b,c,d,e,g,k	Acids & bases pyr Recap equilibrium pyr	Exam questions on simple calculations (pH, K _a , pK _a), interleaving some 3.3.9 questions. Exam questions and calculations on buffers	b,c,d,e,f,g,j,k
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Required Practical 9 – Acid-base titration Carry out titrations of different combinations of strong/weak acids & bases, draw pH curves and identify appropriate indicators for the titration end point	3.1.2 3.1.12	b,c,d,h,i,j		Practical write up and exam questions associated with topic. Interleaved with 3.1.12 questions for extra practice	b,c,d,e,f,g,j,k
3.2.4 – Properties of Period 3 elements & oxides Reactions with water Trends in formation of oxides Mp trends Reactions of oxides with water & pH Structures of acids & anions formed	3.1.1 3.1.3 3.1.12 3.2.1 3.2.2	a,c,d,e,k,l	Period 3 pyr Periodicity recap	Exam questions interleaving 3.2.1 for recall practice and 3.1.12 for pH calculations	a,c,d,e,f,g,j,k,l
3.2.5 – Transition Metals Definitions and properties Ligands and substitution reactions Shapes of complexes Formation of coloured ions Variable oxidation states of TM Use as catalysts	3.1.1 3.1.2 3.1.3 3.1.5 3.1.7 3.1.11 3.2.1 3.3.1 3.3.6 3.3.8 3.3.13	a,b,c,d,e,j,k,l	TM pyr Shapes of molecules pyr	Exam questions on properties & substitution reactions, interleaving with 3.1.1 (atomic structure) Exam questions on shapes and colours, interleaving with 3.1.3 Exam questions on variable oxidation states & catalysis (REDOX titration)	a,b,c,d,e,f,g,j,k,l
3.2.6 – Reactions of ions in aqueous solutions Formation of M^{2+} and M^{3+} hexa-aqua complexes & their subsequent acidity Amphoteric character of some complexes	3.1.1 3.1.3 3.2.1 3.2.5 RP4	e,j,k,l	Aqueous ions pyr RP4 recal	Exam questions covering all aspects of topic interleaved with 3.2.5 and prior knowledge topics	e,f,g,j,k,l
Required Practical 11 – Aqueous ions Carry out reactions to identify metal cations in solution	RP4	g,i,j	Practical pyr	Practical write up and follow up exam style questions	g,j,k,l
Y13 exams					
Y13 exams					

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