

Unit	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
The Periodic Table	Describe how	SC4a Elements and	Starter questions	Literacy: key	Connection finding	Homework: retrieval
	Mendeleev arranged	the Periodic Table		words,	(linking)	quizzing which will assess
	the elements, known	SC4b Atomic	Exam-type	definitions,	to use connections from	both current learning
	at that time, in a	number and mass	questions	summary notes.	past experiences (KS3) to	and learning from
	periodic table by	number			seek generalisations in	previous
	using properties of	SC4c Isotopes	Hinge questions		the topic	years. Homework will be
	these elements and					set on Educake, Century
	their compounds.		Use of web-based		VAAs	Tech, Isaac Physics or
	Describe how		applications to	Numeracy:		Seneca Premium.
	Mendeleev used his		assess knowledge in	summary notes,	Hard Working: Practice –	
	table to predict the		lesson (e.g. Isaac	equation	Self-regulate and revise	Exam questions may also
	existence and		Physics, Educake,	practice,	practice schedules in line	be set as homework.
	properties of some		Active Learn etc.)		with improvements.	
	elements not then			General maths		There will be revision
	discovered. Recall		End-of-topic tests.	skills (e.g.	Set own goals and	homework before each
	the formulae of			rearranging	monitor progress	Census Assessment and
	elements, simple			equations, graph	towards them.	Topic Test.
	compounds and ions.		End of year exam	plotting,		
	Explain that		(PPE).	standards form ,	Actively seek ways to	
	Mendeleev thought			SI prefixes)	improve.	
	he had arranged		Mathematical skills			
	elements in order of		will be assessed	Equations	Agile - Enquiring	
	increasing relative		through	students are	Independently identify	
	atomic mass but this		examinations. The	required to recall	questions and problems,	
	was not always true		minimum level of	and apply (list a)	justify their interest in	
	because of the		mathematics in	and which	them, and critically	
	relative abundance of				consider whether they	



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	isotopes of some		the foundation tier	they are required	are worth asking and	
	pairs of elements in		examination papers	to select from a	solving.	
	the periodic table.		will be equivalent to	list and apply (list		
	Explain the meaning		Key Stage 3	b).	Use connections from	
	of atomic number of		mathematics. The		across the curriculum to	
	an element in terms		minimum level of		develop their enquiry,	
	of position in the		mathematics in the		answering questions that	
	periodic table and		higher tier		are of real value to	
	number of protons in		examination papers		society both in and	
	the nucleus. Describe		will be equivalent to		outside.	
	that in the periodic		foundation tier			
	table:		GCSE in		ACP	
	a) elements are		Mathematics.			
	arranged in order of				Analysing: Precision –	
	increasing atomic				Select appropriate skills	
	number, in rows				and conventions and use	
	called periods				effectively to reach	
	b) elements with				strong outcomes.	
	similar properties are					
	placed in the same				Realising: Automaticity –	
	vertical columns				Effortlessly use key facts,	
	called groups.				concepts and ideas	
	Identify elements as				relevant to the stage of	
	metals or non-metals				learning.	
	according to their					
	position in the				Draw upon a range of	
	periodic table.				skills without the need to	
	Predict the electronic				think or process	
	configurations of the					
	first 20 elements in					



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	the periodic table as diagrams and in the form, for example, Explain how the electronic configuration of an element is related to its position in the periodic table					Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or
Ionic Bonding	Explain how ionic bonds are formed by the transfer of electrons between atoms to produce cations and anions, including the use of dot and cross diagrams. Recall that an ion is an atom or group of atoms with a positive or negative charge. Calculate the numbers of protons, neutrons and electrons in simple ions given the atomic number and mass number. Explain the formation of ions in ionic compounds	SC5a Ionic Bonds SC5b Ionic Lattices SC5c Properties of ionic compounds			Connection finding (linking) to use connections from past experiences (KS3) Atoms into molecules into compounds and mixtures Self-regulation to monitor, evaluate and self-correct as this topic	Seneca Premium. Exam questions may also be set as homework. There will be revision homework before each Census Assessment and Topic Test.



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	from their atoms, limited to compounds of elements in groups 1, 2, 6 and 7. Recall the formulae of elements, simple compounds and ions. Explain the use of the endings –ide and – ate in the names of compounds. Recall the formulae of elements, simple compounds and ions. Deduce the formulae of ionic compounds (including oxides, hydroxides, halides, nitrates, carbonates and sulfates) given the formulae of the constituent ions. Explain the structure of an ionic compound			FBV, other links		
	as a lattice structure: a)consisting of a regular arrangement of ions					



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	b)held together by strong electrostatic forces (ionic bonds) between oppositely-charged ions. Explain the properties of ionic compounds limited to: a) high melting points and boiling points, in terms of forces between ions b) whether or not they conduct electricity as solids, when molten and in aqueous solution					Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also
Covalent Bonding	Explain how a covalent bond is formed when a pair of electrons is shared between two atoms. Recall that covalent bonding results in the formation of molecules. Explain the formation of simple molecular, covalent substances,	SC6a Covalent bonds			Complex and multi-step problem solving to break down a task (e.g., equations), decide on a suitable approach, and then act. Start with a compound and break it down into its atoms. Risk-taking	be set as homework. There will be revision homework before each Census Assessment and Topic Test.



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	using dot and cross diagrams, including a hydrogen b hydrogen chloride c water d methane e oxygen f carbon dioxide				Being brave enough to work in unfamiliar contexts.	
Types of Substance	Explain the properties of typical covalent, simple molecular compounds limited to a)low melting points and boiling points, in terms of forces between molecules (intermolecular forces) b)poor conduction of electricity. Describe, using poly(ethene) as the example, that simple polymers consist of large molecules containing chains of carbon atoms. Recall that	SC7a Molecular compounds SC7b Allotropes of carbon SC7c Properties of metals SC7d Bonding models	Starter questions Exam-type questions Hinge questions Use of web-based applications to assess knowledge in lesson (e.g. Isaac Physics, Educake, Active Learn etc.) End-of-topic tests. End of year exam (PPE).		VAAs Hard Working: Practice – Self-regulate and revise practice schedules in line with improvements. Set own goals and monitor progress towards them. Actively seek ways to improve. Agile - Enquiring Independently identify questions and problems, justify their interest in them, and critically	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework. There will be revision homework before each Census Assessment and Topic Test.



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	graphite and				consider whether they	
	diamond are different		Mathematical skills		are worth asking and	
	forms of carbon and		will be assessed		solving.	
	that they are		through			
	examples of covalent		examinations. The		Use connections from	
	giant molecular		minimum level of		across the curriculum to	
	substances. Describe		mathematics in		develop their enquiry,	
	the structures of		the foundation tier		answering questions that	
	graphite and		examination papers		are of real value to	
	diamond. Explain, in		will be equivalent to		society both in and	
	terms of structure		Key Stage 3		outside.	
	and bonding, why		mathematics. The			
	graphite is used to		minimum level of		ACP	
	make electrodes and		mathematics in the			
	as a lubricant,		higher tier		Analysing: Precision –	
	whereas diamond is		examination papers		Select appropriate skills	
	used in cutting tools.		will be equivalent to		and conventions and use	
	Explain the properties		foundation tier		effectively to reach	
	of fullerenes including		GCSE in		strong outcomes.	
	C60 and graphene in		Mathematics.			
	terms of their				Realising: Automaticity –	
	structures and				Effortlessly use key facts,	
	bonding.				concepts and ideas	
	Explain the properties				relevant to the stage of	
	of metals, including				learning.	
	malleability and the					
	ability to conduct				Draw upon a range of	
	electricity. Describe				skills without the need to	
	most metals as shiny				think or process	
	solids which have					



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	high melting points,					
	high density and are					
	good conductors of					
	electricity whereas					
	most non-metals					
	have low boiling					
	points and are poor					
	conductors. Describe					
	the limitations of					
	particular					
	representations and					
	models to include dot					
	and cross, ball and					
	stick models and two-					
	and three-					
	dimensional					
	representations.					
	Explain why elements					
	and compounds can					
	be classified as					
	a)ionic					
	b)covalent, simple					
	molecular					
	c)covalent, giant					
	molecular					
	d)metallic					
	, i					
	and how the structure					
	and bonding of these					
	types of substances					



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	results in different physical properties, including relative melting point and boiling point, relative solubility in water and ability to conduct electricity (as solids and in solution)					
Acids and Alkalis	Recall that acids in solution are sources of hydrogen ions and alkalis in solution are sources of hydroxide ions Recall that a neutral	SC8a Acids, alkalis and indicators SC8b Looking at acids SC8c Bases and Salts SC8c Core Practical	Starter questions Exam-type questions Hinge questions		VAAs Hard Working: Practice – Self-regulate and revise practice schedules in line with improvements.	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century
	solution has a pH of 7 and that acidic solutions have lower pH values and alkaline solutions higher pH values Recall the effect of	 Preparing copper sulfate SC8d Alkalis and balancing equations SC8d Core practical-Investigating neutralisation 	Use of web-based applications to assess knowledge in lesson (e.g. Isaac Physics, Educake, Active Learn etc.)		Set own goals and monitor progress towards them. Actively seek ways to improve.	Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework. There will be revision
	acids and alkalis on indicators, including litmus, methyl orange and phenolphthalein	SC8e Alkalis and neutralisation SC8f Reactions of acids with metals and carbonates	End-of-topic tests. End of year exam (PPE).		Agile - Enquiring Independently identify questions and problems, justify their interest in them, and critically	homework before each Census Assessment and Topic Test.



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	Recall that the higher	SC8g Solubility		,	consider whether they	
	the concentration of		Mathematical skills		are worth asking and	
	hydrogen ions in an		will be assessed		solving.	
	acidic solution, the		through			
	lower the pH; and the		examinations. The		Use connections from	
	higher the		minimum level of		across the curriculum to	
	concentration of		mathematics in		develop their enquiry,	
	hydroxide ions in an		the foundation tier		answering questions that	
	alkaline solution, the		examination papers		are of real value to	
	higher the pH. Recall		will be equivalent to		society both in and	
	that as hydrogen ion		Key Stage 3		outside.	
	concentration in a		mathematics. The			
	solution increases by		minimum level of		ACP	
	a factor of 10, the pH		mathematics in the			
	of the solution		higher tier		Analysing: Precision –	
	decreases by 1		examination papers		Select appropriate skills	
	Explain the terms		will be equivalent to		and conventions and use	
	dilute and		foundation tier		effectively to reach	
	concentrated, with		GCSE in		strong outcomes.	
	respect to amount of		Mathematics.			
	substances in solution				Realising: Automaticity –	
	Explain the terms				Effortlessly use key facts,	
	weak and strong				concepts and ideas	
	acids, with respect to				relevant to the stage of	
	the degree of				learning.	
	dissociation into ions					
	Recall that a base is				Draw upon a range of	
	any substance that				skills without the need to	
	reacts with an acid to				think or process	



Unit	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	form salt and water					
	only					
	Explain the general					
	reactions of aqueous					
	solutions of acids					
	with:					
	a metals					
	b metal oxides					
	c metal hydroxides					
	d metal carbonates					
	to produce salts					
	Describe a					
	neutralisation					
	reaction as a reaction					
	between an acid and					
	a base					
	Explain why, if soluble					
	salts are prepared					
	from an acid and an					
	insoluble reactant:					
	a excess of the					
	reactant is added					
	b the excess reactant					
	is removed					
	c the solution					
	remaining is only salt					
	and water					
	Investigate the					
	preparation of pure,					
	dry, hydrated copper					



Unit:	Core knowledge/skill development	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	sulfate crystals					
	starting from copper					
	oxide					
	Recall that alkalis are					
	soluble bases.					
	Explain the general					
	reactions of aqueous					
	solutions of acids with					
	metal hydroxides to					
	produce salts.					
	Investigate the					
	change in pH on					
	adding powdered					
	calcium hydroxide or					
	calcium oxide to a					
	fixed volume of dilute					
	hydrochloric acid					
	Explain an acid-alkali					
	neutralisation as a					
	reaction in which					
	hydrogen ions (H+)					
	from the acid react					
	with hydroxide ions					
	(OH–) from the alkali.					
	Explain why, if soluble					
	salts are prepared					
	from an acid and a					
	soluble reactant:					
	a titration must be					
	used					



Unit	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	b the acid and the					
	soluble reactant are					
	then mixed in the					
	correct proportions					
	c the solution					
	remaining, after					
	reaction, is only salt					
	and water. Describe					
	how to carry out an					
	acid-alkali titration,					
	using burette, pipette					
	and a suitable					
	indicator, to prepare					
	a pure, dry salt.					
	Explain the general					
	reactions of aqueous					
	solutions of acids with					
	(a) metals and (d)					
	metal carbonates to					
	produce salts.					
	Describe the chemical					
	test for (a) hydrogen;					
	(b) carbon dioxide					
	(using limewater).					
	Recall the general					
	rules which describe					
	the solubility of					
	common types of					
	substances in water:					



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	a all common					
	sodium, potassium					
	and ammonium salts					
	are soluble					
	b all nitrates are					
	soluble					
	c common chloride					
	are soluble except for					
	those of silver and					
	lead					
	d common sulfates					
	are soluble except					
	those of lead, barium					
	and calcium					
	e common					
	hydroxides and					
	carbonates are					
	insoluble except					
	those of sodium,					
	potassium and					
	ammonium					
	Predict, using					
	solubility rules,					
	whether or not a					
	precipitate will be					
	formed when named					
	solutions are mixed					
	together, naming the					
	precipitate, if any					



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	Describe the method					
	used to prepare a					
	pure, dry sample of					
	an insoluble salt					
Calculations	Calculate relative	SC9a Masses and	Starter questions	Arithmetic	VAAs	Homework: retrieval
involving Masses	formula mass given	empirical formula	'	computation		quizzing which will assess
	relative atomic	SC9bConservation	Exam-type	when calculating	Hard Working: Practice –	both current learning
	masses	of mass	questions	yields and atom	Self-regulate and revise	and learning from
	Calculate the	SC9c Moles	'	economy	practice schedules in line	previous
	formulae of simple		Hinge questions	 Arithmetic 	with improvements.	years. Homework will be
	compounds from			computation,	·	set on Educake, Century
	reacting masses and		Use of web-based	ratio, percentage	Set own goals and	Tech, Isaac Physics or
	understand that these		applications to	and multistep	monitor progress	Seneca Premium.
	are empirical		assess knowledge in	calculations	towards them.	
	formulae		lesson (e.g. Isaac	permeates		Exam questions may also
	Deduce:		Physics, Educake,	quantitative	Actively seek ways to	be set as homework.
	a the empirical		Active Learn etc.)	chemistry	improve.	
	formula of a			 Change the 		There will be revision
	compound from the		End-of-topic tests.	subject of a	Agile - Enquiring	homework before each
	formula of its			mathematical	Independently identify	Census Assessment and
	molecule			equation	questions and problems,	Topic Test.
	b the molecular		End of year exam	• Provide	justify their interest in	
	formula of a		(PPE).	answers to an	them, and critically	
	compound from its			appropriate	consider whether they	
	empirical formula and		Mathematical skills	number of	are worth asking and	
	its relative molecular		will be assessed	significant figures	solving.	
	mass		through	 Convert units 		



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Unit		Sequence	examinations. The minimum level of mathematics in the foundation tier examination papers will be equivalent to Key Stage 3 mathematics. The minimum level of mathematics in the higher tier examination papers will be equivalent to foundation tier GCSE in Mathematics.	numeracy, PSHE,	,	
	substance Calculate the concentration of solutions in g dm ⁻³					



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
	Explain why, in a reaction, the mass of product formed is controlled by the mass of the reactant which is not in excess Deduce the stoichiometry of a reaction from the masses of the reactants and products Recall that one mole of particles of a substance is defined as: a the Avogadro constant number of particles (6.02 x 1023 atoms, molecules, formulae or ions) of that substance b substance mass of 'relative particle mass' g Calculate the number of:					
	a moles of particles of a substance in a given mass of that					



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	substance and vice versa b particles of a substance in a given number of moles of that substance and vice versa c particles of a substance in a given mass of that substance and vice versa					
Electrolytic Processes	Recall that electrolytes are ionic compounds in the molten state or dissolved in water Describe electrolysis	SC10a Electrolysis SC10a Core Practical-Electrolysis of copper sulfate solution SC10b Products	Starter questions Exam-type questions Hinge questions		VAAs Hard Working: Practice – Self-regulate and revise practice schedules in line with improvements.	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be
	as a process in which electrical energy, from a direct current supply, decomposes electrolytes Explain the movement of ions	from electrolysis	Use of web-based applications to assess knowledge in lesson (e.g. Isaac Physics, Educake,		Set own goals and monitor progress towards them. Actively seek ways to improve.	set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework.



Unit:	Core knowledge/skill development:	Sequence	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	during electrolysis, in		Active Learn etc.)			There will be revision
	which:				Agile - Enquiring	homework before each
	a positively charged		End-of-topic tests.		Independently identify	Census Assessment and
	cations migrate to the				questions and problems,	Topic Test.
	negatively charged				justify their interest in	
	cathode		End of year exam		them, and critically	
	b negatively charged		(PPE).		consider whether they	
	anions migrate to the				are worth asking and	
	positively charged		Mathematical skills		solving.	
	anode		will be assessed			
	Explain the formation		through		Use connections from	
	of the products in the		examinations. The		across the curriculum to	
	electrolysis, using		minimum level of		develop their enquiry,	
	inert electrodes, of		mathematics in		answering questions that	
	some electrolytes,		the foundation tier		are of real value to	
	including: a copper		examination papers		society both in and	
	chloride solution		will be equivalent to		outside.	
	b sodium chloride		Key Stage 3			
	solution		mathematics. The		ACP	
	c sodium sulfate		minimum level of			
	solution		mathematics in the		Analysing: Precision –	
	d water acidified with		higher tier		Select appropriate skills	
	sulfuric acid		examination papers		and conventions and use	
	e molten lead		will be equivalent to		effectively to reach	
	bromide		foundation tier		strong outcomes.	
	(demonstration)		GCSE in			
	Predict the products		Mathematics.		Realising: Automaticity –	
	of electrolysis of other				Effortlessly use key facts,	
	binary, ionic				concepts and ideas	
	compounds in the					



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	molten state				relevant to the stage of	
	Write half equations				learning.	
	for reactions					
	occurring at the				Draw upon a range of	
	anode and cathode in				skills without the need to	
	electrolysis				think or process	
	Explain oxidation and					
	reduction in terms of					
	loss or gain of					
	electrons Recall that					
	reduction occurs at					
	the cathode and that					
	oxidation occurs at					
	the anode in					
	electrolysis reactions					
	Explain the formation					
	of the products in the					
	electrolysis of copper					
	sulfate solution, using					
	copper electrodes,					
	and how this					
	electrolysis can be					
	used to purify copper					
	Core Practical:					
	Investigate the					
	electrolysis of copper					
	sulfate solution with					
	inert electrodes and					
	copper electrodes					



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Obtaining and	Deduce the relative	SC11a Reactivity	Starter questions		VAAs	Homework: retrieval
Using Metals	reactivity of some	SC11b Ores				quizzing which will assess
	metals, by their	SC11c Oxidation and	Exam-type		Hard Working: Practice –	both current learning
	reactions with water,	reduction	questions		Self-regulate and revise	and learning from
	acids and salt	SC11d Life cycle			practice schedules in line	previous
	solutions Explain	assessment and	Hinge questions		with improvements.	years. Homework will be
	displacement	recycling				set on Educake, Century
	reactions as redox		Use of web-based		Set own goals and	Tech, Isaac Physics or
	reactions, in terms of		applications to		monitor progress	Seneca Premium.
	gain or loss of		assess knowledge in		towards them.	
	electrons Explain the		lesson (e.g. Isaac			Exam questions may also
	reactivity series of		Physics, Educake,		Actively seek ways to	be set as homework.
	metals (potassium,		Active Learn etc.)		improve.	
	sodium, calcium,					There will be revision
	magnesium,		End-of-topic tests.		Agile - Enquiring	homework before each
	aluminium, (carbon),				Independently identify	Census Assessment and
	zinc, iron, (hydrogen),				questions and problems,	Topic Test.
	copper, silver, gold) in		End of year exam		justify their interest in	
	terms of the reactivity		(PPE).		them, and critically	
	of the metals with				consider whether they	
	water and dilute acids		Mathematical skills		are worth asking and	
	and that these		will be assessed		solving.	
	reactions show the		through			
	relative tendency of		examinations. The		Use connections from	
	metal atoms to form		minimum level of		across the curriculum to	
	cations		mathematics in		develop their enquiry,	
	Recall that:		the foundation tier		answering questions that	
	a most metals are		examination papers		are of real value to	
	extracted from ores		will be equivalent to		society both in and	
	found in the Earth's				outside.	



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	crust		Key Stage 3			
	b unreactive metals		mathematics. The		ACP	
	are found in the		minimum level of			
	Earth's crust as the		mathematics in the		Analysing: Precision –	
	uncombined		higher tier		Select appropriate skills	
	elements Explain		examination papers		and conventions and use	
	oxidation as the gain		will be equivalent to		effectively to reach	
	of oxygen and		foundation tier		strong outcomes.	
	reduction as the loss		GCSE in			
	of oxygen		Mathematics.		Realising: Automaticity – Effortlessly use key facts,	
	Recall that the				concepts and ideas	
	extraction of metals				relevant to the stage of	
	involves reduction of				learning.	
	ores					
	Explain why the				Draw upon a range of	
	method used to				skills without the need to	
	extract a metal from				think or process	
	its ore is related to its				·	
	position in the					
	reactivity series and					
	the cost of the					
	extraction process,					
	illustrated by					
	a heating with carbon					
	(including iron)					
	b electrolysis					
	(including aluminium)					
	(knowledge of the					
	blast furnace is not					



Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	required)					
	Evaluate alternative					
	biological methods of					
	metal extraction					
	(bacterial and					
	phytoextraction)					
	Explain how a metal's					
	relative resistance to					
	oxidation is related to					
	its position in the					
	reactivity series					
	Evaluate the					
	advantages of					
	recycling metals,					
	including economic					
	implications and how					
	recycling can					
	preserve both the					
	environment and the					
	supply of valuable					
	raw materials					
	Describe that a life-					
	cycle assessment for					
	a product involves					
	consideration of the					
	effect on the					
	environment of					
	obtaining the raw					
	materials,					
	manufacturing the					



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	product, using the					
	product and					
	disposing of the					
	product when it is no					
	longer useful					
	Evaluate data from a					
	life cycle assessment					
	of a product					
Reversible	Recall that chemical	SC12a dynamic	Starter questions		VAAs	Homework: retrieval
reactions and	reactions are	equilibrium				quizzing which will assess
equilibria	reversible, the use of		Exam-type		Hard Working: Practice –	both current learning
	the symbol ⇌ in		questions		Self-regulate and revise	and learning from
	equations and that				practice schedules in line	previous
	the direction of some		Hinge questions		with improvements.	years. Homework will be
	reversible reactions					set on Educake, Century
	can be altered by		Use of web-based		Set own goals and	Tech, Isaac Physics or
	changing the reaction		applications to		monitor progress	Seneca Premium.
	conditions Explain		assess knowledge in		towards them.	
	what is meant by		lesson (e.g. Isaac			Exam questions may also
	dynamic equilibrium		Physics, Educake,		Actively seek ways to	be set as homework.
	Describe the		Active Learn etc.)		improve.	
	formation of					There will be revision
	ammonia as a		End-of-topic tests.		Agile - Enquiring	homework before each
	reversible reaction				Independently identify	Census Assessment and
	between nitrogen				questions and problems,	Topic Test.
	(extracted from the		End of year exam		justify their interest in	
	air) and hydrogen		(PPE).		them, and critically	
	(obtained from				consider whether they	
	natural gas) and that				are worth asking and	
	it can reach a				solving.	



Unit:	Core knowledge/skill development	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
	dynamic equilibrium		Mathematical skills			
	Recall the conditions		will be assessed		Use connections from	
	for the Haber process		through		across the curriculum to	
	as: a temperature 450		examinations. The		develop their enquiry,	
	°C b pressure 200		minimum level of		answering questions that	
	atmospheres c iron		mathematics in		are of real value to	
	catalyst		the foundation tier		society both in and	
	Predict how the		examination papers		outside.	
	position of a dynamic		will be equivalent to			
	equilibrium is affected		Key Stage 3		ACP	
	by changes in:		mathematics. The			
	a temperature		minimum level of		Analysing: Precision –	
	b pressure		mathematics in the		Select appropriate skills	
	c concentration		higher tier		and conventions and use	
			examination papers		effectively to reach	
			will be equivalent to		strong outcomes.	
			foundation tier			
			GCSE in		Realising: Automaticity –	
			Mathematics.		Effortlessly use key facts,	
					concepts and ideas	
					relevant to the stage of	
					learning.	
					Draw upon a range of	
					skills without the need to	
					think or process	
Transition Metals	Recall that most	SC13a Transition	Starter questions		VAAs	Homework: retrieval
and Alloys and	metals are transition	metals	'			quizzing which will assess
Corrosion	metals and that their	SC13b Corrosion				both current learning



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	typical properties	SC13c Electroplating	Exam-type		Hard Working: Practice –	and learning from
	include:	SC13d Alloying	questions		Self-regulate and revise	previous
	a high melting point	SC13e Uses of			practice schedules in line	years. Homework will be
	b high density	metals and their	Hinge questions		with improvements.	set on Educake, Century
	c the formation of	alloys				Tech, Isaac Physics or
	coloured compounds		Use of web-based		Set own goals and	Seneca Premium.
	d catalytic activity of		applications to		monitor progress	
	the metals and their		assess knowledge in		towards them.	Exam questions may also
	compounds as		lesson (e.g. Isaac			be set as homework.
	exemplified by iron		Physics, Educake,		Actively seek ways to	
	Recall that the		Active Learn etc.)		improve.	There will be revision
	oxidation of metals					homework before each
	results in corrosion		End-of-topic tests.		Agile - Enquiring	Census Assessment and
	Explain how rusting of				Independently identify	Topic Test.
	iron can be				questions and problems,	
	prevented by:		End of year exam		justify their interest in	
	a exclusion of oxygen		(PPE).		them, and critically	
	b exclusion of water				consider whether they	
	c sacrificial protection		Mathematical skills		are worth asking and	
	Explain how		will be assessed		solving.	
	electroplating can be		through			
	used to improve the		examinations. The		Use connections from	
	appearance and/or		minimum level of		across the curriculum to	
	the resistance to		mathematics in		develop their enquiry,	
	corrosion of metal		the foundation tier		answering questions that	
	objects		examination papers		are of real value to	
	Explain, using models,		will be equivalent to		society both in and	
	why converting pure		Key Stage 3		outside.	
	metals into alloys		mathematics. The			
	often increases the				ACP	



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
	strength of the product Explain why iron is alloyed with other metals to produce alloy steels Explain how the uses of metals are related to their properties (and vice versa), including aluminium, copper and gold and their alloys including magnalium and brass		minimum level of mathematics in the higher tier examination papers will be equivalent to foundation tier GCSE in Mathematics.		Analysing: Precision – Select appropriate skills and conventions and use effectively to reach strong outcomes. Realising: Automaticity – Effortlessly use key facts, concepts and ideas relevant to the stage of learning. Draw upon a range of skills without the need to think or process	
Quantitative Analysis	Calculate the concentration of solutions in mol dm–3 and convert concentration in g dm–3 into mol dm–3 and vice versa Core Practical: Carry out an accurate acidalkali titration, using burette, pipette and a suitable indicator Carry out simple	SC14a Yields SC14b Atom Economy SC14c Concentrations SC14d Titrations and calculations SC14d Core practical Acid-Alkali titrations SC14e Molar volume of gases	Starter questions Exam-type questions Hinge questions Use of web-based applications to assess knowledge in lesson (e.g. Isaac Physics, Educake,	 Arithmetic computation when calculating yields and atom economy Arithmetic computation, ratio, percentage and multistep calculations permeates quantitative chemistry 	VAAs Hard Working: Practice – Self-regulate and revise practice schedules in line with improvements. Set own goals and monitor progress towards them. Actively seek ways to improve.	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework.



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
	calculations using the		Active Learn etc.)	• Change the		There will be revision
	results of titrations to			subject of a	Agile - Enquiring	homework before each
	calculate an unknown		End-of-topic tests.	mathematical	Independently identify	Census Assessment and
	concentration of a			equation	questions and problems,	Topic Test.
	solution or an			Provide	justify their interest in	
	unknown volume of		End of year exam	answers to an	them, and critically	
	solution required		(PPE).	appropriate	consider whether they	
	Calculate the			number of	are worth asking and	
	percentage yield of a		Mathematical skills	significant figures	solving.	
	reaction from the		will be assessed	 Convert units 		
	actual yield and the		through	where	Use connections from	
	theoretical yield		examinations. The	appropriate	across the curriculum to	
	Describe that the		minimum level of	particularly from	develop their enquiry,	
	actual yield of a		mathematics in	mass to moles	answering questions that	
	reaction is usually less		the foundation tier		are of real value to	
	than the theoretical		examination papers		society both in and	
	yield and that the		will be equivalent to		outside.	
	causes of this include:		Key Stage 3			
	a incomplete		mathematics. The		ACP	
	reactions b practical		minimum level of			
	losses during the		mathematics in the		Analysing: Precision –	
	experiment c		higher tier		Select appropriate skills	
	competing, unwanted		examination papers		and conventions and use	
	reactions (side		will be equivalent to		effectively to reach	
	reactions)		foundation tier		strong outcomes.	
	Recall the atom		GCSE in			
	economy of a		Mathematics.		Realising: Automaticity –	
	reaction forming a				Effortlessly use key facts,	
	desired product				concepts and ideas	
	Calculate the atom					



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
	economy of a				relevant to the stage of	
	reaction forming a				learning.	
	desired product					
	Explain why a				Draw upon a range of	
	particular reaction				skills without the need to	
	pathway is chosen to				think or process	
	produce a specified				·	
	product, given					
	appropriate data such					
	as atom economy,					
	yield, rate, equilibrium					
	position and					
	usefulness of by-					
	products					
	Describe the molar					
	volume, of any gas at					
	room temperature					
	and pressure, as the					
	volume occupied by					
	one mole of					
	molecules of any gas					
	at room temperature					
	and pressure (The					
	molar volume will be					
	provided as 24 dm3					
	or 24000 cm3 in					
	calculations where it					
	is required)					
	Use the molar volume					
	and balanced					



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	equations in					
	calculations involving					
	the masses of solids					
	and volumes of gases					
	Use Avogadro's law					
	to calculate volumes					
	of gases involved in a					
	gaseous reaction,					
	given the relevant					
	equation					
Dynamic	Describe the Haber	SC15a Fertilisers and	Starter questions		VAAs	Homework: retrieval
equilivbria,	process as a	the Haber Process				quizzing which will assess
Calculations	reversible reaction	SC15b Factors	Exam-type		Hard Working: Practice –	both current learning
Involving Volumes	between nitrogen	affecting equilibrium	questions		Self-regulate and revise	and learning from
of Gases	and hydrogen to				practice schedules in line	previous
	form ammonia		Hinge questions		with improvements.	years. Homework will be
	Predict how the rate					set on Educake, Century
	of attainment of		Use of web-based		Set own goals and	Tech, Isaac Physics or
	equilibrium is affected		applications to		monitor progress	Seneca Premium.
	by:		assess knowledge in		towards them.	
	a changes in		lesson (e.g. Isaac			Exam questions may also
	temperature		Physics, Educake,		Actively seek ways to	be set as homework.
	b changes in pressure		Active Learn etc.)		improve.	
	c changes in					There will be revision
	concentration		End-of-topic tests.		Agile - Enquiring	homework before each
	d use of a catalyst				Independently identify	Census Assessment and
	Explain how, in				questions and problems,	Topic Test.
	industrial reactions,		End of year exam		justify their interest in	
	including the Haber		(PPE).		them, and critically	
	process, conditions				consider whether they	



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	used are related to:		Mathematical skills		are worth asking and	
	a the availability and		will be assessed		solving.	
	cost of raw materials		through			
	and energy supplies		examinations. The		Use connections from	
	b the control of		minimum level of		across the curriculum to	
	temperature, pressure		mathematics in		develop their enquiry,	
	and catalyst used		the foundation tier		answering questions that	
	produce an		examination papers		are of real value to	
	acceptable yield in an		will be equivalent to		society both in and	
	acceptable time		Key Stage 3		outside.	
	Recall that fertilisers		mathematics. The			
	may contain nitrogen,		minimum level of		ACP	
	phosphorus and		mathematics in the			
	potassium		higher tier		Analysing: Precision –	
	compounds to		examination papers		Select appropriate skills	
	promote plant		will be equivalent to		and conventions and use	
	growth		foundation tier		effectively to reach	
	Describe how		GCSE in		strong outcomes.	
	ammonia reacts with		Mathematics.			
	nitric acid to produce				Realising: Automaticity –	
	a salt that is used as a				Effortlessly use key facts,	
	fertiliser Describe				concepts and ideas	
	and compare: a the				relevant to the stage of	
	laboratory				learning.	
	preparation of					
	ammonium sulfate				Draw upon a range of	
	from ammonia				skills without the need to	
	solution and dilute				think or process	
	sulfuric acid on a					
	small scale b the					



Unit:	Core knowledge/skill development:	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	industrial production					
	of ammonium sulfate,					
	used as a fertiliser, in					
	which several stages					
	are required to					
	produce ammonia					
	and sulfuric acid from					
	their raw materials					
	and the production is					
	carried out on a					
	much larger scale					
	(details of the					
	industrial production					
	of sulfuric acid are					
	not required)					
Chemical Cells and	Recall that a chemical	SC16a Chemical cells	Starter questions		VAAs	Homework: retrieval
Fuel Cells	cell produces a	and fuel cells				quizzing which will assess
	voltage until one of		Exam-type		Hard Working: Practice –	both current learning
	the reactants is used		questions		Self-regulate and revise	and learning from
	up Recall that in a				practice schedules in line	previous
	hydrogen-oxygen		Hinge questions		with improvements.	years. Homework will be
	fuel cell hydrogen					set on Educake, Century
	and oxygen are used		Use of web-based		Set own goals and	Tech, Isaac Physics or
	to produce a voltage		applications to		monitor progress	Seneca Premium.
	and water is the only		assess knowledge in		towards them.	
	product		lesson (e.g. Isaac			Exam questions may also
	Evaluate the strengths		Physics, Educake,		Actively seek ways to	be set as homework.
	and weaknesses of		Active Learn etc.)		improve.	
	fuel cells for given					There will be revision
	uses		End-of-topic tests.			homework before each



Unit:	Core knowledge/skill development	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
			End of year exam (PPE). Mathematical skills will be assessed through examinations. The minimum level of mathematics in the foundation tier examination papers will be equivalent to Key Stage 3 mathematics. The minimum level of mathematics in the higher tier examination papers will be equivalent to foundation tier		Agile - Enquiring Independently identify questions and problems, justify their interest in them, and critically consider whether they are worth asking and solving. Use connections from across the curriculum to develop their enquiry, answering questions that are of real value to society both in and outside. ACP Analysing: Precision — Select appropriate skills and conventions and use	Census Assessment and Topic Test.
			GCSE in Mathematics.		effectively to reach strong outcomes. Realising: Automaticity – Effortlessly use key facts, concepts and ideas relevant to the stage of learning.	



Unit:	Core knowledge/skill development	Sequence:	Assessment	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development	Home learning and enrichment
					Draw upon a range of skills without the need to think or process	