Subject :	Science	Year Group:	5	I				
	Biology	Biology	Biology	Chemistry	Chemiatry	Chemistry	Chernistry	Physics
Scheme title Purpose of	Bioeneneetics Builds on ideas from Y7 and Y8 and develops	Cells Further develops the ideas around cells as the building blocks of	Organisation Looks at the structures and systems inside	Atomic structure and periodic table Building on ideas from Y7 and Y8 to look in more detail at the chemistry of matter and	Chemical Changes This unit further develops ideas from Y7 and Y8 to look in more detail	Chemistry of the Atmosphere This unit looks in greater depth at the human impact on the atmosphere and a	Energy Changes This chemistry topic looks at the energy	Forces Part 1 This unit develops ideas from Y7 and Y8 to
scherne	a more detailed understanding of the energy	life	living things that work together to keep them	how our understanding has developed over time	at some useful chemical reactions	timeline of how it developed in the first place	changes that take place in chemical reactions	look at interactions between objects and
	involved in keeping things are		arve				make when they are carried out	forces we come across
Knowledge in	Describe the photosynthesis reaction	Grawing and labeling animal and plant cells Medeotopolity the functions of motor of polyacity and plant cells	 Recalling the order : cells – tissues – organs – 	 Bse the names and symbols of the first 20 elements in the periodic Table the elements is Groups 1 and 7. 	Define exidation and reduction in terms of oxygen	 Define the term atmosphere and state the gases (~78% nitrogen, ~21% oxygen, 1% other error on a series with rescharge had error that make an the Fash's 	 Dientify the difference between exothermic and an databases is small and 	 Define scalars and vectors and give example of each
	photosynthesis	Bifferences between types of microscopes eg. resolution and	organisms, giving examples and describing	 Barne compounds of these elements from given formulae or 	Classify reactions as being either oxidation or reduction	atmosphere.	 Bse of a range of apparatus and techniques 	 Represent vectors using arrows to show the
	 Brik photosynthesis to previous learning on plant tissues 	magnification, how samples are prepared •Magnification calculations and rearranging formula and how to	their function. Recall and describe key plant tissues:	 Bymbol equations Brite word equations for the reactions in this specification 	 Recall and describe the reaction of metals with water and acid Deduce an order of reactivity based on the reactions of metals 	 Bustrate the composition of Earth's present atmosphere using a pie chart (common success criteria). 	for conducting and monitoring chemical reactions.	magnitude and direction. •Define contact and non-contact forces and
	 Describe the effects of different factors on 	use units (LA,M)	epidermis, palisade, mesophyll, xylem,	Retrite formulae and balanced chemical equations for reactions	 Explain why some metals are more reactive than others 	Describe the formation of Earth's early atmospheric composition and how it has	 Record observations during chemical 	give examples of each.
	Explain 'limiting factors'	 auggest now cells start off the same and change for specific jobs eg: sperm cells, egg cells, root hair cells (in both plants and 	root hair cells	Pefining key differences between atoms, elements, compounds and mixtures	 Describe now the reactivity series identifies now metals are extracted Diplain the meaning of the term reduction with regards to oxygen 	changed over time, identifying key points and the main causes of changes – 4.5 billion years ago, high level of volcanic activity, atmosphere mostly CO2, water	 State the changes in energies of chemicals 	 Define weight as the force due to gravity an is due to a gravitational field.
	Bye and interpret data on rate of	animals)	Describe and explain Transpiration and	Drawing diagrams and recognising the above when given in a question	Evaluate specific metal estraction processes	vapour condenses to form oceans. 2.7 billion years ago, evolution of	and their surroundings for endothermic and	 Weight = mass x gravitational field strength
	•Dise the inverse square law of light intensity	cell division used for growth and repair	that affect these processes	dioxide	 Reform a number of displacement reactions and deduce relative 	million years ago, atmosphere becomes stable as we see it today.	 Bate what must happen for a reaction to 	and weight is measured using a calibrated
	In the context of photosynthesis •Describe how limiting factors can be	 The use of stem cells in society for treating diseases (embryonic and adult stem cells and how each can be used in different way) 	•Defining and explaining diention and the	 Electible, explain and give examples of the specified processes of Expansion 	reactivity of metals from the results (HT ONLY) • Explain why displacement occurs (HT ONLY)	 Define greenhouse gases, as 'gases which absorb and re-emit longwave radiation in the atmosphere. leading to the greenhouse effect' and identify the main GHG's 	 Occur and define activation energy Occur and define activation energy 	spring balance (Newton meter) •Ealculate the resultant of two forces acting
	controlled in greenhouses	•State the advantages and disadvantages of embryonic and adult	fate of nutrients.	 Buggest suitable separation and purification techniques for 	Deplain reduction and oxidation in terms of loss or gain of electrons	as carbon dioxide, methane and water vapour.	 Describe the energy changes in bond 	in a straight line. Use free body diagrams to
	 Bse data to relate limiting factors to the economics of greenhouses 	 Stem cells Onderstand how molecules can be moved from one place to 	 Bentifying nutrients through required practical work. 	 Bistures when given appropriate information. Bractical methods for carrying out chromatography, separating mixtures of liquid and 	(HT OND) •White ionic equations for displacement reactions. (HT OND)	 Bxplain the greenhouse effect as 'the process in which GHG's absorb and re-emi- longwave radiation, leading to an increase in the temperature at the Earth's 	 Dreaking and bond making Deplain why reactions are endothermic or 	 Dse vector diagrams to resolve forces into
	 Describe how glucose can be stored in plants 	another eg: gases-diffusion, liquids-osmosis, glucose/nutrients-	·Modelling enzymes: lipase, amylase and	solids (crystallisation and distillation)	 Bentify in a given reaction, symbol equation or half equation which remains an antidead activity are reduced. NOT ONLY. 	surface'.	exothermic in terms of bonds	two components at right angles.
	plants	Bescribe the 3 processes above using specific examples in plants	through required practical.	Stating the key features of the subatomic particles in the atom (electrons, protons	Safely perform reactions between metals and acids and test the	links to activities such as burning fossil fuels, deforestation and agriculture.	reaction	Newton-metre
	 Explain why each of these is important Describe cellular respiration as an 	and animals eg: oxygen in and carbon dioxide out by diffusion in the lunes of animals, carbon dioxide in and oxygen out of stomata	 Describe and explain the structure and function of the human heart and associated 	and neutrons)- limited to charge and mass • Developments in the organisation of the atom (links to physics atomic structure unit)	- Brite word and balanced symbol equations for these reactions	 Describe some of the effects of dimate change, such as sea ice melting, rising sea levels, extreme weather events leading to droughts and flooding. 	 Measure the potential difference of difference electrochemical cells 	 Work done against friction causes a rise in temperature of the object
	eapthermic reaction	of plant leaves etc	blood vessels, pacemaker cells and the blood.	 Explain why the new evidence from the scattering experiment led to a change in the 	 Bentify which reagents are oxidised and which are reduced in a 	 Define the term carbon footprint as 'a process of measuring the amount of 	Explain the difference between rechargeable	 Give examples of forces involved with
	 Explain why respiration is important Represent aerobic respiration as word and 		 Description of CVD, risk factors and 	atomic model •Explain the difference between the plum pudding model and nuclear model of the	 Define the words 'acid', 'base' and 'alkali' 	GHG's something releases during its lifecycle." • Explore ways we can reduce our own carbon footprint and what government	 Bvaluate the use of cells 	stretching, bending and compressing an object.
	symbol equations		treatments.	atom	 Recall the general equation for acids reacting with alkalis Reset on axid with an abalt to make a soft 	and business are doing, such as using renewable energy sources and offsetting	 Evaluate the use of hydrogen fuel cells in 	 Borce = Spring constant x extension ('F' is disselfs expressional in 's'). Formation the
	plants and yeast		 Evaluation of artificial pacemakers and replacement valves, transplants and artificial 	spicars or experimental work supporting the some model are not effequired.	 Becord observations from an experiment clearly and systematically 	 Biplain how human activity is influencing the natural carbon cycle through the 	batteries	difference between elastic deformation and
	 Write word equations for anaerobic resolvation 		hearts. •Defining health as the state of physical and	Details of Chadwick's experimental work are not required. Relate size and scale of atoms to objects in the objectal world	Describe the test for carbon dioxide Write word equations for the reactions between with and metal	burning and release of stored carbon in fossil fuels as carbon dioxide into the atmosphere	 Write the half-equations for the electrode reactions in the hadronen fuel cell 	inelastic deformation.
	Dompare aerobic and anaerobic respiration		mental well-being.	Explain how the position of an element in the periodic table isrelated to the	carbonates	 Define combustion as an exothermic reaction between a fuel and oxidant. 		potential energy is stored in the spring. Elast
	 Describe the energy demands of the body during exercise 		 Rwareness that disease can be both communicable and non-communicable. 	arrangement of electrons in its atoms and hence to its atomic number • predict possible reactions and probable reactivity of elements from their positions in	 Prepare a pure, dry sample of a soluble sait from an insoluble coide or carbonate, using a Bunsen burner to heat dilute acid and a water 	 Describe complete and incomplete combustion, with reference to the conditions needed for each (complete – enough available oxygen, incomplete – not enough 		potential energy = 0.5 x spring constant x (extension)2
	Brestigate changes in heart rate, breathing		 Otherpret data and link correlations with 	the periodic table.	bath or electric heater to evaporate the solution.	oxygen available), and the products formed (complete - carbon dioxide and		PHY'S ONLY
	Explain oxygen debt		 Describe cancer as the result of changes in 	 Drawing the electron comparation of the first 20 elements of the periodic table using dot and cross diagrams 	 Describe the purpose of the priscale Describe the use of universal indicator to measure the approximate 	water, incomplete – carbon (soot), carbon monoxide and water, may also produce sulphur dioxide and oxides of nitrogen).		force is called the moment of a force.
	Define metabolism		cells that lead to uncontrolled growth and	 Enderstanding the work and influence of several scientists on the developments of the second stable (Mandalase, Mandala) 	pH of a solution	Recall the word/symbol equations for complete and incomplete combustion		State and use the equation for moments. N
	carbohydrates, proteins and lipids		division.	Explain changes to the organisation of the periodic table eg: increasing atomic	Sale the priscale to identify addic or arcaine conditions Sale the ions formed in addic and alkaline conditions	(complete - Hydrocarbons (fuel) + Okygen II carbon dicoute +water, incomplete - Hydrocarbon (fuel) + okygen II carbon + carbon monoside + water).		distance (m)
	 Tink together the reactions that encompass 			number, periods, groups, gaps for newly found elements	 Recall the ionic equation for neutralisation 	 Dutline the effects of the products of the incomplete combustion of fossil faels on handle and the products of the incomplete combustion of fossil faels 		 Explain how levers and gears transmit the exterior of forces.
				transition elements	Describe how to carry out itrations using strong acids and strong	Bescribe how acid rain comes about through the release of sulphur dioxide and		Define pressure: Fluids can either be liquids
				 Beplain the differences between metals and non-metals on the basis of their characteristic physical and chemical properties. This links to Genun 0. Genun 1. Genun 2. 	alkalis to find the reacting volumes accurately (DIEMISTRY ONLY)	oxides of nitrogen, produced through incomplete combustion, and its effects, such as damage to plants, more and buildings		or gases. The pressure in fluids causes a force
				and Bonding, structure and the properties of matter	concentrations in mol/dm3 and in g/dm3 (CHEMISTRY ONLY, HT ONLY)	state the stages of a Life Cycle Analysis (LCA) in the correct order (extracting and		 Rate the equation for calculating pressure
				 Replain how the atomic structure of metals and non-metals relates to their position in the periodic table 	 Recall the difference between strong and weak acids (HT ONLY) Deduce the relative strength of acids based on their reactions DFT 	processing raw materials, manufacturing and packaging, use and reuse and the disposal of the product).		as: p+F/A (pressure (pascals) = force (newtors) / area of surface
				Boplain how the reactions of elements are related to the arrangement of electrons in	ONLY)	Deplain the importance of LCA, in that it accounts for total environmental		Calculate the pressure due to a column of
				 Brolain how properties of the elements in Group 0 depend on the outer shell of 	Describe the effect of changing concentration on pH (HT ONLY) Define electrolysis and electrolyte	impact, not just GHG emissions, and how it can be misused, through subjective value judgements.		liquid: P-hps (pressure(pascals) = height (metres) s
				electrons of the atoms	 Bentify the ions that move to each electrode during electrolysis 	 Evaluate products in detail using LCAs. 		density (Kg/m3) x gravitational field strength
				 Bredict properties from given trends down the group. Brolain how properties of the elements in Group 1 depend on the outer shell of 	 State what happens to the ions at each electrode Describe how to perform electrolysis on an ionic compound 			(z) • Explain that a partially submerred object
				electrons of the atoms	 Describe what happens to the ions during electrolysis 			experiences a greater pressure on the botton
				 Bredict properties from given trends down the group. Replain how properties of the elements in Group 7 depend on the outer shell of 	 Explain how elements are formed from ions State what is added to aluminium oxide before electrolysis 			surface than the top surface. This creates a resultant force upwards, called upthrust.
				electrons of the atoms	 Describe the importance of electrolysis to extract aluminium from its 			 Describe factors that influence floating and
				 predict properties from given trends down the group. 	 Deplain why the positive electrode must be continually replaced 			sincing of dejects.
				CHEM ONLY	 Redict the products of the electrolysis of aqueous solutions 			
				hardness and reactivity with oxygen, water and halogens.	 Recall where oxidation and reduction happen during electrolysis (HT 			
				 Deemplify these general properties by reference to Cr, Mn, Fe, Co, Ni, Cu. Deemplify these general properties by reference to compounds of Cr, Mn, Fe, Co, Ni 	ONLY) •Write half-enuation for the reactions that hannen during electrobols			
				Cu.	(HT ONLY)			
					 Recall the half equations for the electrolysis of acidic and alkaline solutions (HT ONLY) 			
Skills	Maths link- how to rearrange equations and layout common mathematical problems in	Maths link- how to rearrange equations for calculating magnification	Maths link •Bow to calculate rates and percentages.	Maths link- how to use standard units for volumes and convert between, simple addition to work out electronic configuration and to count numbers of electrons in	Writing accurate word equations Writing balanced symbol equations	Links to GCSE chemistry topics 4.7 organic chemistry. -Unks to GCSE biology topics 4.7 ecology.	Maths link- Calculating temperature change in reactions. Talking measurements from scales	Maths link- •Bow to rearrange equations for calculating
	science		·Read accurately and interpret various forms	shells of atoms and ions, calculating Rf values for chromatography	 Dsing standard form when writing very large or small numbers (e.g. 	-Unks to geography topics.	In practicals.	eg: work done
	Scientific equipment : choosing appropriate and drawing scientific diagrams	Literacy link- writing and structure of a method for practical lessons and required practical assessment, how to structure 6	of data Compare data by calculating % changes.	Literacy link- writing and structure of a method for practical lessons and required	 concentration of H+) Designing a comprehensive method for completing a practical 	-Use of word/ symbol equations for combustion.	Literacy link- writing and structure of a	 Dnear and non-linear relationships on graphs
		mark extended response question, how to incorporate scientific	•Mean, median and moode	practical assessment, how to structure 6 mark extended response question, how to	Drawing up a risk assessment in tabular form, using terms Hazard, Bish and Descention	-Units to carbon cycle and photosynthesis.	method for practical lessons and required	Calculating a constant from a straight-line
		Repwords correctly into answers. Tables- how to present a risk assessment for practical activities eg:	Literacy link	Tables- how to present a risk assessment for practical activities eg: hazard, risk,	 Whiting and structure of a method for practical lessons and required 	-Addity to crisically evaluate information from multiple sources. -Understanding the difference between subjective and objective evidence.	extended response question, how to	grape.
		hazard, risk, precaution	Bescribing and explaining data	precaution	practical assessment, how to structure 6 mark extended response	Able to see 'bigger picture' and link together different topics, e.g. atmosphere	incorporate scientific keywords correctly into	Literacy link-
			factors associated with lifestyle		answers	Numeracy	long answer questions.	practical lessons and required practical
			 Describing structures from recall 		 Bormation of positive and negative ions – writing half-equations 	-Use of pie charts to illustrate data.	Tables- how to present a risk assessment for	assessment, how to structure 6 mark
							Practical skills - recording observations during	incorporate scientific keywords correctly into
						-Writing and structuring answers to extended response questions.	practicals.	answers
						Able to interpret current news stories relating to topic and evaluate evidence.		Tables-
								 Bow to present a risk assessment for practical activities eg: hazard, risk, precaution
Key Words	Respiration -Is the chemical reaction which	Eukaryotic cell - Have cell membrane, cytoplasm and nucleus, eg:	Enzyme - A protein molecule that is a	Atom - The smallest unit of matter. Have a radius of approx 0.1nm. Have no overall	Oxidation - Gain of oxygen or loss of electrons	Greenhouse gases (GHG's) -Gases which absorb and re-emit longwave radiation is	Exothermic - Energy is transferred to the	Vector - something that is described using
	occurs inside the mitochondria	animal and plant cells	biological catalyst	charge. Flement - & udstance made on of only one time of store which execution	Reduction - Loss of oxygen or gain of electrons	the atmosphere, leading to the greenhouse effect.	surroundings Endethermic - Energy is taken in form "	magnitude and direction e.g. force, velocity
	Aerobic – Using oxygen Anaerobic – Without using oxygen	Prokaryotic cell - do not nave a nucleus, genetic material is looped, egi bacteria	only bind to one substrate	broken into other substances. Represented by symbols Eg: Na. Approx 300 different	displaces a less reactive metal from a compound	radiation, leading to an increase in the temperature at the Earth's surface.	surroundings	to descrobe it e.g. mass, speed
	Exothermic -Meaning that energy is released to the surroundings.	Sub cellular structures - Small structures inside a cell e.g. nucleus Nucleus (B) - Controls cell activities contains DNA	Lock and key - The model of how enzymes direct substrates	elements. Compound - A substance made of two or more elements that have located characterity	Base - A metal colde or hydroxide Alkali - A soluble base Electrohais - Process whose -instance	Global warming - The increase in overall global temperature caused by excess levels of GHG's in the atmosphere.	Activation energy - The minimum amount of energy that particles must have to reart	
	Metabolism -Is the combination of all the	Cytoplasm (B) - Where chemical reactions take place	Emulsify - Breaking large lipid globules into	These atoms are usually, but not always, joined in molecules. Can only be separated	current is passed through an electrolyte to separate ions	Climate change - The change in global weather patterns caused by excess levels		
	reactions in a cell or in the body Fermentation- In plants/yeast cells.	Cell membrane (B) - Controls what enters and leaves the cell Cell wall (P)- made from cellulose fibres. Strengthers the cell and	smaller droplets Contraction - The only description to use to	into elements by chemical reactions. Mixture - Two or more elements or compounds, not chemically bonded together. Can	Anode - Positive electrode Cathode - Negative electrode	of GHG's in the atmosphere. Shortwave solar radiation - Radiation from the sun that is seen as visible light (or		
	anaerobic respiration makes different	supports the plant.	describe muscle movement	be separated by physical processes.	Anion - Negative ion (e.g. non-metal ions)	near visible light). Contains lots of energy.		
	products. This is called termentation.	Ribosomes (B) - Make proteins by protein synthesis	after expansion	element, joined by chemical bonds. Compounds are typically made of up molecules.	Cation - Positive ion (e.g. metal ions) Electrolyte - Molten or aqueous ionic compound.	Longwave radiation - Hadiation with a longer wavelength, that is seen as intrared light. Contains less energy than shortwave radiation.		
		Chloroplasts (P) - Where photosynthesis occurs. Contains	Meristem - Where new cells are made in	Mass number - The sum of the protons and neutrons in the nucleus	Cryolite - Substance added to aluminium oxide to lower melting point	Carbon footprint - A process of measuring the amount of GHG's something		
		Chlorophyli (P) - Green pigment used for photosynthesis found in	Xylem - Plant organ transporting water and	electrons		Life cycle analysis (LCA) - A process of measuring the overall environmental		
		chloroplasts Vacuola (P) - Contains cell san	minerals upwards only Phinem - Plant organ transporting dissolved	Nucleus - The center of an atom, a region where protons and neutrons are located. The nucleus accounts for the atomic mass. Radiuseless than 1/10000 (1x10.14m) of		impact of something during its lifecycle. Value indements - The scores assigned to the effects of a pollutent liked in ICA		
		Specialised cellCells that are modified to carr+C7y out a particular	sugars everywhere in plants.	atom		Pollution - The introduction of contaminants (such as chemical substances) to an		
		function. Found in both animals and plants Magnification - New much bigger an image annears than the real	Transpiration - Evaporation out of the leaf Translocation - Movement of dissolved water	Neutron - A subatomic particle that has no charge. Found in the nucleus. Protonal positively charged particle in an atom. The number of protons in the nucleus.		environment. Particulates - Solid environ of particles suspended in linuid or eas		
		object	through the plant in the phloem	of an atom is the atomic number of an element.				
		Resolution - Ability to distinguish between two very small and closely spaced objects		Electron - A negatively charged particle in an atom. Instrumentom of the same element with the same number of posteros bowever a				
				different number of neutrons. This means they have a different mass number.				
				ion - An atom or atoms that has lost or gained one or more electrons, to become a charged particle. Eg: Na +				
End Point	Biolony Paper 1	Biology Paper 1	Biolony Paper 1	Chemistry Paper 1	Chemistry Paper 1	Chemistry Paper 2	Chemistry Paper 1	Physics Paper 2
Assessment method	Common marking points throughout the unit (CMPs) to be completed as follows:	common marking points throughout the unit (CMPs)- feedback provided by teacher at the following points:	Common marking points throughout the unit (CMPs)- feedback provided by teacher ++ +he	common marking points throughout the unit (CMPs)- feedback provided by teacher at the following points:	common marking points throughout the unit (CMPs)-feedback provided by teacher at the following points:	common marking points throughout the unit (CMPs) to be completed as follows: CMP-1 greenhouse gases and greenhouse effect. Focusing on the communities and	common marking points throughout the unit (CMPs)- feedback provided by teacher + the	Common marking points throughout the unit (CMPs)- feedback provided by teacher at the
		Lesson-6: Cell differentiation + CMP1	following points:	Lesson-5- Chromatography + CMP 1	Lesson 6: Acids and metals and CMP-1	evolution of the atmosphere and human impact on this.	following points:	following points:
	CMP – 1 in lesson 5 Uses of glucose CMP – 2 in lesson 9 Metabolism	Lesson-20. Intro to transport + LMP2	Lesson 9. CMP2	session and wetails and non metails, notice gases + CMP 2	Lesson 17: Electrolysis of molten ionic compounds and CMP-3	change	and CMP 1.	Lesson 6: forces and elasticity and CMP-2
	Annual many months and a second	End of unit cells test (30mins) to be given after lesson-13 (end of	Lesson13. CMP3	End of unit Atoms test (30mins) to be given after lesson-13 (end of unit)	Field of Phone in the second se	Fact of web second		Find of costs former best free
	as follows:	unity	Lind or crist Ref0000e rest (Jumin)		22 (which is a unit review lesson)	Anne ar anne manmaarfillit.		after lesson-12 (end of unit)
	Exam Q - lesson 1 Photosynthesis							
	Exam Q - lesson 3 Analysis of limiting factors							
	Exam Q - lesson 8 Effect of exercise							
_	End of unit assessment to assess learning							
			1	1	1		1	1