

Combined Science Year 10 Curriculum End Points and key vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2	
Unit of Work	 Organisation continued Bonding, Structure and the Properties of Matter Particle Model of Matter 	 Organisation continued Bioenergetics Quantitative Chemistry Atomic Structure 	 Bioenergetics continued Chemical Changes Forces and motion 	 Ecology Chemical Changes continued Forces and Motion continued 	 Ecology continued Chemical Analysis Forces and Motion continued 	 Infection and Response Energy Changes Waves 	
Ethos links	 STEM - explaining how the body works, how tech can be used to treat coronary heart disease STEM- how materials behave, uses of polymers, what causes the properties of a substance (melting point, conductivity etc), uses and applications of nanotechnology Sust. – Environmental implications of nanotechnology STEM – explaining observations 	 STEM - explaining how the body works, how tech can be used to treat coronary heart disease STEM – Understanding the human body STEM – calculations STEM – calculations STEM – Theories and models developing over time due to technological advances. Radioactive decay and nuclear fusion/fission 	 STEM – Understanding the human body STEM – extracting metals for use. Sust. – Using resources from the Earth sustainably. STEM – understanding stopping distances and linking this to transport MK – Calculating speed of journeys around the city 	 STEM – waste management, using farming techniques to improve food security, the role of biotechnology in meeting demands of the growing population. Sust. – maintaining biodiversity, materials cycling, food security, sustainable fishing STEM – extracting metals for use. Sust. – Using resources from the Earth sustainably. STEM – understanding stopping distances and linking this to transport MK – Calculating speed of journeys around the city 	 STEM – waste management, using farming techniques to improve food security, the role of biotechnology in meeting demands of the growing population. Sust. – maintaining biodiversity, materials cycling, food security, sustainable fishing STEM – using instrumental methods to identify compounds in drugs testing etc. design of formulations for a purpose 	 STEM – preventing disease, drug development STEM – What is happening in a chemical reaction. Sust. Using hydrogen fuel cells STEM – using waves to detect or explore, how lenses are used to improve vision, uses of the EM in communication, medicine and investigation 	
Knowledg e	 By the end of this unit students will know and understand: Organisation How cells, tissues, organs and organ systems are arranged The structure and function of the digestive system What enzymes are, how they work and what they are used for, and factors affecting enzymes, including carbohydrases, amylase, proteases and lipases, the products of digestion and what they are used for 	 By the end of this unit students will know and understand: <u>Organisation Continued</u> How cells, tissues, organs and organ systems are arranged The structure and function of the digestive system What enzymes are, how they work and what they are used for, and factors affecting enzymes, including carbohydrases, amylase, proteases and lipases, the products of digestion and what they are used for 	By the end of this unit students will know and understand:Bioenergetics- The photosynthetic reaction, both word and symbol- The factors affecting the rate of photosynthesis, and how these can be controlled to give maximum growth and maximum profit- How to measure the rate of photosynthesis- How plants use glucose- The equations for aerobic and anaerobic respiration, and the similarities and	 By the end of this unit students will know and understand: Ecology What an ecosystem is, and how organisms interact and compete The biotic and abiotic factors that can affect a community in an ecosystem How organisms are adapted to live in their habitat The levels of organisation and how this relates to feeding relationships How to measure the population size of a species in a habitat through sampling How carbon and water are cycled through an ecosystem The impact of environmental changes on the distribution of species in an ecosystem What is meant by biodiversity and why it is important 	 By the end of this unit students will know and understand: Ecology What an ecosystem is, and how organisms interact and compete The biotic and abiotic factors that can affect a community in an ecosystem How organisms are adapted to live in their habitat The levels of organisation and how this relates to feeding relationships How to measure the population size of a species in a habitat through sampling 	 By the end of this unit students will know and understand: <u>Infection and Response</u> How diseases are caused and spread by viruses, bacteria, protists and fungi, and consequently how the spread can be reduced The causes, symptoms, prevention and methods of spread of the viral diseases measles, HIV and tobacco mosaic virus The causes, symptoms, prevention and methods of spread of the bacterial diseases salmonella and gonorrhoea. The causes, symptoms, prevention and methods of spread of the fungal disease rose black spot The causes, symptoms, prevention and methods of spread of the fungal disease rose black spot The causes, symptoms, prevention and methods of spread of the protist disease malaria. 	



- т	he role of bile in	- The role of bile in	differences between	- How waste is managed to reduce	- How carbon and water are	- Human defence systems such as skin,
	ligestion	digestion	them. Including the	pollution	cycled through an	nose, trachea, bronchi, stomach, and
	The structure of the	- The structure of the	fermentation of yeast.	- The effects of human population on	ecosystem	how white blood cells help to defend
	eart and lungs,	heart and lungs,	- How the body responds	land use, leading to deforestation and	- How temperature, water	against pathogens by phagocytosis,
	ncluding adaptations	including adaptations	to exercise in terms of	global warming	and oxygen affect the rate	antibodies and antitoxins
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	he three different	- The three different types	heart rate, breathing	- Strategies to maintain biodiversity	of decay of biological	- The use of vaccination and antibiotics
	ypes of blood vessel	of blood vessel and how	rate and breath volume	- How we can fish sustainably	material (triple only)	to prevent and treat disease, alongside
	nd how their structure	their structure relates to	- How the body	- The role of biotechnology in meeting	- The impact of	painkillers which can treat symptoms
	elates to function	function	metabolises lactic acid	the demands of the growing	environmental changes on	of disease.
	he composition of	- The composition of	(HT)	population	the distribution of species	 The stages of discovery and
b	lood and the function	blood and the function	 What is meant by 		in an ecosystem	development of new drugs, from
a	nd adaptation of each	and adaptation of each	metabolism, and the	Chemical Changes	- What is meant by	plants and microorganisms (digitalis,
C	omponent	component	importance of sugars,	- The reactions of metal with oxygen,	biodiversity and why it is	aspirin, penicillin) and synthesis in the
- T	he causes of coronary	- The causes of coronary	amino acids, fatty acids	including the terms oxidation and	important	pharma industry.
h	eart disease and how	heart disease and how	and glycerol.	reduction	- How waste is managed to	
tl	his can be treated	this can be treated		- The reactivity series and how this	reduce pollution	Energy Changes
- C	Causes of ill health	- Causes of ill health	Chemical Changes	relates to a metal's tendency to form a	- The effects of human	- The terms endothermic and
(0	communicable and	(communicable and non-	- The reactions of metal	positive ion and their reactions with	population on land use,	exothermic, how temperature changes
n	ion-communicable	communicable disease	with oxygen, including	water and acid.	leading to deforestation	and some examples of each type of
d	lisease and lifestyle	and lifestyle factors) and	the terms oxidation and	- The extraction of metals by reduction	and global warming	reaction
	actors) and how	how different types of	reduction	of oxides	- Strategies to maintain	- What is meant by activation energy,
	lifferent types of	disease interact	- The reactivity series and	- Oxidation and reduction in terms of	biodiversity	and how this is represented on a
	lisease interact	- Types of cancer and how	how this relates to a	electrons (HT)	- How we can fish	reaction profile of an exothermic and
	ypes of cancer and	lifestyle factors can	metal's tendency to	- How acids react with metals, forming	sustainably	endothermic reaction
	iow lifestyle factors	affect risk	form a positive ion and	salt and hydrogen	- The role of biotechnology	- How energy is transferred when
	an affect risk	 Plant tissues and how 	their reactions with	- The neutralisation of acids to produce	in meeting the demands of	breaking or making bonds, and how
	lant tissues and how	the structure is related	water and acid.	a salt and water, or a salt, water and	the growing population	this results in the overall energy
	he structure is related	to the function	- The extraction of metals	carbon dioxide		
	o the function			- How to make soluble salts	Chemical Analysis	change
		Discovergation	by reduction of oxides		- What pure substance and	Mayor
Dana	ling. Church und and the	Bioenergetics	- Oxidation and reduction	- The pH scale, including the ions	formulations are	Waves
	ding, Structure and the	- The photosynthetic	in terms of electrons	present in acids and alkalis, and how		- The properties of transverse and
	erties of Matter	reaction, both word and	(HT)	they react with each other	- What chromatography is	longitudinal waves and their motion
	low atoms form	symbol	- How acids react with	- The difference between strong and	and how it works	- What is meant by frequency and
	hemical bonds	- The factors affecting the	metals, forming salt and	weak acids, and some examples of	- How to test for hydrogen,	period of a wave, and how to calculate
	hrough transfer or	rate of photosynthesis,	hydrogen	each (HT)	oxygen, carbon dioxide and	frequency, period and speed of a wave
	haring of electrons	and how these can be	- The neutralisation of	- How electrolysis works, including	chlorine gas	- The electromagnetic spectrum, and
	low ionic, covalent and	controlled to give	acids to produce a salt	molten and aqueous compounds,		how electromagnetic waves travel and
	netallic bonds are	maximum growth and	and water, or a salt,	predicting the products formed, as well	Force and Motion continued	refract and the properties and uses of
	ormed	maximum profit	water and carbon	as how it is used to extracted metals	- The difference between	some electromagnetic waves
	he properties of ionic	- How to measure the rate	dioxide	 How to represent the reactions of 	scalar and vector	-
	ompounds and how	of photosynthesis	 How to make soluble 	electrolysis with half equations	quantities, and some	
tl	hese relate to the	- How plants use glucose	salts		examples of each	
S	tructure	- The equations for	 The pH scale, including 	Forces and Motion	- Contact and non-contact	
- T	he properties of	aerobic and anaerobic	the ions present in acids	- The difference between scalar and	forces, and some examples	
S	olids, liquids and gases	respiration, and the	and alkalis, and how	vector quantities, and some examples	of each	
a	nd how these relate to	similarities and	they react with each	of each	- The force of weight and	
t	he strength of forces	differences between	other	- Contact and non-contact forces, and	how it is calculated	
	between the particles	them. Including the	- The difference between	some examples of each	- What is meant by resultant	
	of the substance	fermentation of yeast.	strong and weak acids,	- The force of weight and how it is	force and how to calculate	
	low to use state	- How the body responds	and some examples of	calculated	it and represent it with a	
	ymbols in an equation	to exercise in terms of	each (HT)		free body diagram	
J	, see a equation			1		

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-	The properties of	heart rate, breathing	 How electrolysis works, 	-	What is meant by resultant force and	-	What is meant by work	
	simple covalent	rate and breath volume	including molten and		how to calculate it and represent it		done	
	structures and how	- How the body	aqueous compounds,		with a free body diagram	-	The equation linking force	
	these relate to the	metabolises lactic acid	predicting the products	-	What is meant by work done		with spring constant and	
	structure	(HT)	formed, as well as how	-	The equation linking force with spring		extension and how to use it	
	How polymers are	- What is meant by	it is used to extracted		constant and extension and how to use		What causes pressure in	
						-	fluids and how it is	
	formed and how their	metabolism, and the	metals		it			
	structure is	importance of sugars,	 How to represent the 	-	What causes pressure in fluids and how		calculated using p=F/A and	
	represented by a	amino acids, fatty acids	reactions of electrolysis		it is calculated using p=F/A and p=hpg		p=hpg	
	diagram	and glycerol.	with half equations	-	What causes atmospheric pressure	-	What causes atmospheric	
-	The properties of			-	Distance and displacement and use		pressure	
	diamond, graphite and		Forces and Motion		them to calculate speed and velocity	-	Distance and displacement	
	silicon dioxide, and how	Quantitative Chemistry	- The difference between	-	The distance-time relationship and		and use them to calculate	
	these relate to their	- The conservation of mass	scalar and vector		how this is shown on a graph		speed and velocity	
	structure	- Relative formula mass	quantities, and some	-	Acceleration and how to use equations	-	The distance-time	
-	The properties of	and how to calculate	examples of each		linking to it $(a=\Delta t/v)$ and $v^2-u^2=2as$		relationship and how this is	
	metals and alloys and	percent by mass	- Contact and non-contact	-	Velocity time graphs and calculations		shown on a graph	
	how these relate to	 Why reactions might 	forces, and some		to find acceleration and distance	-	Acceleration and how to	
	their structure	appear to involve a	examples of each		travelled		use equations linking to it	
-	The properties and uses	change in mass	- The force of weight and	-	Newton's first law and how this affects		(a= $\Delta t/v$) and v ² -u ² =2as	
	of graphene ad	- What is meant by a mole	how it is calculated		motion	-	Velocity time graphs and	
	fullerenes, and how	and how this relates to	- What is meant by	-	Newton's second law and the equation		calculations to find	
	these relate to their	atoms, molecules, ions,	resultant force and how		F=ma		acceleration and distance	
	structure	compounds and	to calculate it and		Newton's third law		travelled	
	Uses and properties of	equations (HT)	represent it with a free		What is meant by stopping distance		Newton's first law and how	
-	• •		•	-		-		
	nanoparticles	- What is represented in a	body diagram		and factors affecting it		this affects motion	
		balanced symbol	- What is meant by work	-	What momentum is and how to	-	Newton's second law and	
Par	ticle Model of Matter	equation (HT)	done		calculate it		the equation F=ma	
-	What is meant by	 How the amount of 	 The equation linking 	-		-	Newton's third law	
	density, how to	reactant/product in a	force with spring			-	What is meant by stopping	
	calculate it and how to	reaction is calculated	constant and extension				distance and factors	
	find the density of	(HT)	and how to use it				affecting it	
	regular and irregular	- What is meant by	- What causes pressure in			-	What momentum is and	
	objects	limiting reactant and	fluids and how it is				how to calculate it	
_	The conservation of	why they are used	calculated using p=F/A					
	mass when applied to	- What is meant by	and p=hpg					
	changes of state	concentration	- What causes					
	Internal energy and							
-		-	atmospheric pressure					
	how this is changes	Atomic Structure (phys)	- Distance and					
	with temperature	- The structure of an atom	displacement and use					
-	What is meant by	and its approximate size	them to calculate speed					
	specific heat capacity	 How to calculate the 	and velocity					
	and how it is calculate	number of protons,	- The distance-time					
-	What is meant by	neutrons and electrons	relationship and how					
	specific latent heat and	in an atom	this is shown on a graph					
	how it is calculated	- What is meant by	- Acceleration and how to					
-	Particle motion in	isotope, and how ions	use equations linking to					
	solids, liquids and gases	are formed	it (a= Δ t/v) and v ² -u ² =2as					
-	.,	- The development of the	 Velocity time graphs and 					
		model of the atom and	calculations to find					
		what led to the changes	acceleration and					
			distance travelled					

	 Why some atoms are radioactive, and how this is measured The three types of nuclear radiation; alpha, beta and gamma, and their range in air, penetrative ability and ionising power How to write nuclear equations showing alpha and beta decay Half life, and how to determine it from given information, including graphs Radioactive contamination and irradiation 		 Newton's first law and how this affects motion Newton's second law and the equation F=ma Newton's third law What is meant by stopping distance and factors affecting it What momentum is and how to calculate it 											
Key vocabular y	Enzyme Artery Vein Capillary Plasma Communicab le Immune system Cancer Mesophyll Xylem Phloem Meristem Stomata	Ionic Covalent Metallic Alloy Chemical bond Nanoparticl e Fullerene Diamond Graphite Silicon dioxide Giant lattice	Photosynthes is Limiting Factor Respiration Aerobic Anaerobic Fermentation Metabolism	Relative formula mass Mole Concentratio n Equation Volume Uncertainty Percentage yield Atom economy Titration	Photosynthes is Limiting Factor Respiration Aerobic Anaerobic Fermentation Metabolism	Acid Alkali Electrolysis Oxidation Reduction Displaceme nt Ion Titration Anode Cathode Anion Cation	Community Ecosystem Abiotic Biotic Extremophile Decompositio n Biodiversity Peat Trophic Biomass Biotechnolog Y Mycoprotein Decomposer	Acid Alkali Electrolysis Oxidation Reduction Displaceme nt Ion Titration Anode Cathode Anion Cation	Resultant force Scalar Vector Velocity Acceleratio n Displaceme nt Elasticity Moments Levers Pressure Momentum	Community Ecosystem Abiotic Biotic Extremophile Decompositio n Biodiversity Peat Trophic Decomposer Biomass Biotechnolog Y Mycoprotein	Formulation Qualitative Quantitative Spectroscopy Precipitation Chromatograp hy	Virus Bacteria Protist Fungi Pathogen Phagocytos is Antibiotic Antibodies Monoclona I Symptom	Exothermic Endotherm ic Reaction Profile Activation energy Catalyst Fuel cell	Transverse Longitudinal Compression Rarefaction Amplitude Frequency Period Wavelength Seismic Electromagnet ic Concave Convex Black body Infrared
		Particle Latent heat Internal energy pressure	Alpha Beta Gamma Isotope Radioactive Irradiation Fusion Fission Decay Half-life		Resultant force Scalar Vector Velocity Acceleration Displacement Elasticity Moments Levers Pressure Momentum						Resultant force Scalar Vector Velocity Acceleration Displacement Elasticity Moments Levers Pressure Momentum			