WESTON FAVELL ACADEMY

Long-term planning (LTPs) - Planning how the key concepts, knowledge, skills identified in the Progression map will be delivered termly per year group
Ensuring that end points & NC/spec are covered
Identifying what assessments are planned and when
Allowing for whole academy intent priorities to be planned for

	Autumn 1					
Unit title:	Communicable diseases	Preventing and treating disease	Non-communicable disease	Electrolysis	Radioactivity	
Unit length:	7 lessons	4 lessons	5 lessons	5 lessons	5 lessons	
Key concepts:	Pathogens can be spread The human immune system has lines of defence	The body has natural defences Technology can be used to prevent or reduce the effects of disease	Non communicable diseases have a range of risk factors How risk factors can be reduced	Ionic liquids and solutions can be split/decomposed using dc current Extraction of metals more reactive than carbon requires electrolysis		
Knowledge/ Skills:	Key The ways that names pathogens can be transmitted The differences between communicable and non-communicable disease Core Some Pathogens can only be addressed using specific medication The role and action of vaccines Vaccines are constantly under development as are antibiotics and anti-virals Powerful Links to Digestion, non-communicable disease and	Key The role of pathogens in disease (including measuring zones of inhibition as in the required practical). The ways technology can be used to treat disease Core Exercise and drug use can affect health and the body systems Use a range of data on diet, alcohol use, health and disease at all scales The role of obesity on health Powerful Biotic factors in Ecology	Key How exercise and drug use can affect health and the body systems Interpret a range of data on diet, alcohol use, health and disease at all scales Understand the role of obesity on health Core The consequences of imbalances in diet The impact of exercise and drug use the human gas exchange system The effects if recreational drugs on health Powerful Biotic factors in Ecology	Key Ions are subject to electrostatic forces when subject to electric fields Elements produced at electrodes depend on reactivity Core How the concentration of hydrogen ions can be used to give a pH value To interpret displacement and acid + metal reactions in terms of oxidation and reduction Powerful Electrostatic forces in Physics Electrolytes in Biology	Key All atoms of a particular element have the same number of protons. The number of protons in an atom of an element is called its atomic number. The total number of protons and neutrons in an atom is called its mass number. Atoms of the same element can have different numbers of neutrons; these atoms are called isotopes of that element. Core Some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable. This is a random process called radioactive decay. The results from the alpha scattering experiment led to the conclusion that the	

					mass of an atom was concentrated at the centre (nucleus) and that the nucleus was charged. This nuclear model replaced the plum pudding model. Powerful Links to atomic structure and the periodic table in Chemistry as well as to non-communicable diseases in biology	
End points covered:	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Appreciation of the function of multicellular organisms	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Appreciation of the function of multicellular organisms	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Appreciation of the function of multicellular organisms	Appreciate that the evolution of the Earth's atmosphere has been and remains an ongoing due to a number of processes which provide resources we use today	Appreciate that energy is released during nuclear decay and that this can be used as an energy resource, with issues	
NC/Spec coverage:	2.2.5 , 3.1.1, 1.1.6 , 3.1.2 , 3.1.3, 3.1.4, 3.1.5, 3.3.1**,** 3.3.2	3.1.7, 3.1.8, 3.1.9, 3.2.1, 3.2.2	2.2.6, 2.2.7	4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5 H	4.1.1, 4.1.2, 4.1.3, 4.2.1, 4.2.2, 4.2.4	
Cross-curricular links:	Links to food hygiene in Catering, H&SC and Child development.	History of medicine in History H&SC, Child development Mathematics for the calculations/ graph work	History of medicine in History H&SC, Child development Mathematics for the calculations/ graph work	Links to Physics	Links to Chemistry and biology	
Assessments:						
Other academy intent priorities						
Curriculum Careers - Gatsby 4	Microbiologist, nurse, doctor, surgeon, horticulturalist, care worker hygienist, dentist, dental nurse etc.	Nurse, doctor, surgeon, teacher, chef, waiter, food hygienist, microbiologist, forensic scientist	Nurse, doctor, surgeon, teacher, chef, waiter, food hygienist, microbiologist, forensic scientist	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist	Nuclear scientist, radiographer, research scientist, nurse, geologist	
Culturally rich – broadening horizons	Opportunities to: - Discuss health care and healthcare needs in other cultures	Opportunities to: - Discuss changing ideas over time and cooperation	Opportunities to: - Discuss health care and healthcare needs in other cultures	Opportunities to: - Discuss changing ideas over time and cooperation	Opportunities to: Discuss links between subjects Discuss archaeological and near-geological dating	

	- Discussion of environments and cities in other countries and how these environments affect disease risk	between scientists - Discuss health care and healthcare needs in other cultures	- Discussion of cuisine and diet in other cultures and how these can influence the risks of communicable disease	between scientists Discuss mineral resources and occurrence in different countries linked to their cultural heritage		

	Autumn 2					
Unit title:	Quantitative chemistry	Molecules and matter	Rates			
Unit length:	4 lessons	6 lessons	10 lessons			
Key concepts:	Relative atomic/formula mass relates to the mass of a mole of substance Calculations can be used (alongside balanced symbol equations) to calculate moles/ yield etc	Density as a property of a material or object by measuring and calculating the density of solids and liquids. The states of matter, solid liquid and gas, the properties of matter which is in these states and the changes which occur as a material change from one state to another.	Reaction rate is affected by 4 variables Only temperature changes the energy of a particle			
Knowledge/ Skills:	Key How chemical symbols and formulae can be used to represent elements and compounds How to represent reactions using formulae How patterns in reactions are predictable (using the periodic table) The properties of metals and non-metals	Key All matter is made up of particles that have mass and that the volume that the take up depends upon their internal energy and on the energy of their surroundings Core	Key How to apply the particle model to the collision theory used in explaining the rate effects of changing the conditions of a reaction To explain how catalysts change the rate of reaction in terms of activation energy and reaction profiles			

	Conservation of mass How the particle model can be used to illustrate the change in state Core Explain the formulae of compounds Use atomic structure to explain patterns in reactivity Explain the differences between metals and non-metals based upon their atomic structure and bonding Carry out calculations using balanced symbol equations to predict the amounts of reactants and products in a reaction (including moles and concentrations) How to describe changes in state Powerful Concentration / osmosis / diffusion in Biology Pressure in physics	The changes in the properties of matter linked to kinetic theory and the changes in temperature occurring during heating and the concept of latent heat. The concept of internal energy; analysing the behaviour of particles in a solid, liquid or gas as the temperature Powerful Links to: Chemistry – states and energy required to melt or boil Biology – to particle movement and transport	Core The properties of the different states of matter, in terms of the particle model (and gas pressure) What a catalyst does Simple methods for separating mixtures Some examples of combustion and thermal decomposition reactions The structure of some simple molecular substances Powerful Rates of respiration and photosynthesis on biology Particle and collision theory and energy changes The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction			
End points covered:	Use calculations and data analysis	Understanding of how all interactions in the Universe are reliant on forces being exchanged between two or more bodies, and that these force interactions are inextricable from the corresponding energy and momentum conservation within systems.	The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction			
NC/Spec coverage:	3.1.2, 3.2.1, 3.2.3, 3.2.4, 3.3.1, 3.3.2, 3.2.5, 3.4, 3.5, 4.2.5	3.2.1, 3.2.2, 3.2.3, 3.3.1	6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.2.1, 6.2.2, 6.2.3, 6.2.4,6.2.5, 6.2.6, 6.2.7			
Cross-curricular links:	Physics Maths	DT, Biology, Chemistry	Some DT links			

Assessments:						
Other academy intent priorities						
Curriculum Careers - Gatsby 4	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist	Nuclear scientist, radiographer, research scientist, nurse, geologist, seismologist, metallurgist, materials scientist, engineer	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist, vet, electricity generation engineer			
Culturally rich – broadening horizons	Opportunities to: Discuss changing ideas over time and cooperation between scientists of different cultures	Opportunities to: Reinforce the conservation of matter and energy. The idea of changing understanding	Opportunities to: - Discuss changing ideas over time and cooperation between scientists			

	Spring 1					
Unit title:	Rates	The human nervous system	Hormonal coordination			
Unit length:	10 lessons (3 remaining lessons)	4 lessons	8 lessons			
Key concepts:	Reaction rate is affected by 4 variables Only temperature changes the energy of a particle	Nerves carry impulses Nervous response is controlled by the brain / CNS There are different kinds of neurones Neurotransmission is affected by drugs and / or hormones	Hormones are produced by glands and are transported by blood, affecting target organs Hormones control blood sugar, the menstrual cycle and fertility etc.			
Knowledge/ Skills:	Key How to apply the particle model to the collision theory used in explaining the rate effects of changing the conditions of a reaction To explain how catalysts change the rate of reaction in terms of activation	Key The similarities and differences between motor and sensory neurones including with regards to their roles About the nervous system and its interrelationships e.g. the eye	Key The involvement of hormones in reproduction, contraception and assisted fertility Core Some of the hormones and their roles in reproduction / puberty			

	energy and reaction profiles Core The properties of the different states of matter, in terms of the particle model (and gas pressure) What a catalyst does Simple methods for separating mixtures Some examples of combustion and thermal decomposition reactions The structure of some simple molecular substances Powerful Rates of respiration and photosynthesis on biology Particle and collision theory and energy changes The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction	Core Basic neurone function and structure That tissues can be organised into organs with specific functions Powerful Homeostasis – Biology Lenses - Physics	Powerful Biology – nervous system Physics reaction times/ stopping distances			
End points covered:	The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction	Appreciation of the function of multicellular organisms	Appreciation of the function of multicellular organisms			
NC/Spec coverage:	6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7	5.2.1 , 5.2.2	2.2.1, 4.2.3, 5.3.1, 5.3.2, 5.3.4, 5.3.5, 5.3.6, 5.4.1 , 5.4.2			

Cross-curricular links:	Some DT links	Biology – homeostasis, hormonal vs nervous control, reaction times (and physics)	H&SC, Some links to sports science, Child development, Psychology			
Assessments:						
Other academy intent priorities						
Curriculum Careers - Gatsby 4	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist, vet, electricity generation engineer	Sports science, physiotherapy, nursing, doctors, surgeon, neurologist, psychology, optician	Fertility nurse/doctor, nurse, doctor, sports scientist, paediatrician, psychologist, horticulturalist, farmers			
Culturally rich – broadening horizons	Opportunities to: - Discuss changing ideas over time and cooperation between scientists	Opportunities to: - Discuss changing ideas over time and cooperation between scientists	Opportunities to: - Discuss changing ideas over time and cooperation between scientists Discussion of contraception and fertility treatment in cultural context			
	Spring 2					
Unit title:	Chemical analysis	Wave properties	EM Waves			
Unit length:	4 lessons	5 lessons	6 lessons			
Key concepts:	Different anions and cations can be identified using chemical tests Complimentary tests need to be used The uses and reasons for using technology	Waves have definable properties There are 2 wave types, longitudinal and transverse, each having specific characteristics	Light is part of a broader spectrum which is subdivided based on wavelengths The properties of EM depend on wavelength and give rise to their uses and hazards			
Knowledge/ Skills:	Key There is are a range of chemical tests to identify unknown substances/ions and how technology can be used	Key How wave speed wavelength and frequency are related to each other How to measure sound wave speed in air and in a solid	Key How wave speed wavelength and frequency are related to each other How to measure sound wave speed in air and in a solid			

	Core The difference between pure substances and mixtures and how some can be identified The composition of the atmosphere That carbon dioxide is released by human activities and the impact of this upon climate How the earth's resources are finite and the importance of recycling Some of the properties of composite polymers and ceramics How carbon can be used to extract some metals Powerful Links to chemical reactions Links to EM and energy transfers on physics	How the electromagnetic spectrum can carry information and images Refraction being the change in direction a wave takes as it goes from one transparent/translucent medium of one density to another, this change in direction being due to a change in speed) Core The top of a wave is the crest and the bottom is a trough Light waves are much faster than sound waves and can also travel through a vacuum The light spectrum is continuous and shifts across ROYGBIV There are different kinds of waves but they have properties such as refraction in common Powerful Chemistry – Chemical analysis Physics – energy transfers, waves	How the electromagnetic spectrum can carry information and images Refraction being the change in direction a wave takes as it goes from one transparent/translucent medium of one density to another, this change in direction being due to a change in speed) Core The top of a wave is the crest and the bottom is a trough Light waves are much faster than sound waves and can also travel through a vacuum The light spectrum is continuous and shifts across ROYGBIV There are different kinds of wave but they have properties such as refraction in common Powerful Biology – the eye and receptors in the nervous system Chemistry – global warming			
End points covered:	The understanding thar matter is organised into different categories based upon structure, how the different elements are arranged and that and these give rise to distinctive properties.	Understanding that energy can be transferred through media in the form of waves, with no net transfer of matter. Waves can interact with matter and with one another in a multitude of ways with predictable, if unintuitive, outcomes.	Understanding that energy can be transferred through media in the form of waves, with no net transfer of matter. Waves can interact with matter and with one another in a multitude of ways with predictable, if unintuitive, outcomes.			

			Understanding that the atoms that contribute to particle theory are themselves composed of even smaller particles. The compositions and arrangements of these smaller particles dictates the chemical properties of substances, and changing these can lead to drastic and unexpected energy changes.			
NC/Spec coverage:	8.1.1, 8.1.2, 8.1.3, 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.3.5, 8.3.6, 8.3.7	6.1.1 6.1.2, 6.2.1, 6.2.2, 5.6.1.2, 6.1.2, 6.1.4, 6.1.5	6.1.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4			
Cross-curricular links:	Physics	Photography	Photography			
Assessments:						
Other academy intent priorities						
Curriculum Careers - Gatsby 4	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist, vet, electricity generation engineer, motor engineer, petroleum scientist, mining engineers, geologists, botanists, palaeobotanists, palaeontology	Engineer, mechanic, sports scientist, materials scientist, photographer, cinematographer, physical geographer, surveyor, architect, seismologist, forensic scientist, artist	Engineer, mechanic, sports scientist, materials scientist, photographer, cinematographer, physical geographer, surveyor, architect, seismologist, forensic scientist, artist.			
Culturally rich – broadening horizons	Opportunities to: Discuss changing ideas over time and cooperation between scientists Discuss how different tests might be needed when identifying resources from other countries/cultures	Opportunities to: Discuss amplitude and wavelength in terms of Hawaiian surfing waves (stress that “water” waves mustn’t be used as examples of a transverse wave).	Opportunities to: Discuss changing ideas over time and cooperation between scientists Discussion of the reasons for differing amounts of melanin in different countries			

	Summer 1					
Unit title:	Electromagnetism	Reproduction	Forces in balance			
Unit length:	3 lessons	7 lessons	First 4 lessons			
Key concepts:	Electromagnetism can be the result of moving charge. Magnetism is a non contact force Electromagnetic fields can be manipulated and be used to do work.	Variation is caused by genetic differences The differences between sexual and asexual / mitosis and meiosis	Understand the different types of forces as contact and non contact Understand the different types of quantities as vector and scalar Understand turning and resultant forces			
Knowledge/ Skills:	Key How magnetic fields ate produced and how to produce a string electromagnet How to display and record magnetic fields How magnetic fields are used in real life situations Core Magnetism is a non contact force and produces a field Magnetic field lined enter magnets through the south pole and leave the north Powerful Chemistry – similarities to electrostatics	Key The structure of DNA Alleles and their significance Genomes Meiosis in gamete production Core The nucleus of animal and plant cells and the DNA structures of bacteria About mitosis and meiosis Reproduction as a process Inheritance and variation How scientific ideas develop Powerful Genetics, DNA, Ecology	Key The differences between vector and scalar quantities and how these can be represented How calculate resultant force and know how to resolve a force into its perpendicular components The different between speed and velocity and can explain acceleration An understanding of terminal velocity and why falling objects in gases and liquids/solutions reach it Understand conservation of momentum and when to use this rule An understanding of elasticity and how to measure the stiffness of a spring How to calculate weight from given masses and gravitational field strengths Core			

			Forces are measured in Newtons with a Newtonmeter An object is in equilibrium when the forces acting on it are in balance The unit of speed is m's Drag and frictional forces resist the movement of moving objects Whenever objects interact they exert forces on each other Tension is the force on a stretched object, more force=greater extension That the weight of an object depends upon the gravitational force exerted upon its mass Powerful Kinetic theory in chemistry			
End points covered:	Understanding that magnetic fields can be set up and used for different purposes Understand that these waves interact with matter	Understanding of how organisms interact with each other and with their environment Appreciation of the function of multicellular organisms	Understanding of how all interactions in the Universe are reliant on forces being exchanged between two or more bodies, and that these force interactions are inextricable from the corresponding energy and momentum conservation within systems			
NC/Spec coverage:	7.1.1, 7.1.2 , 7.2.1, 7.2.2, 7.2.3, 5.1.2	6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.1.8, 6.2.4	5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.4			
Cross-curricular links:	DT	PSHE/lifeskills Child development Psychology	Sports science Kinetic theory in chemistry Resistance / drag in biology DT			
Assessments:						

Other academy intent priorities						
Curriculum Careers - Gatsby 4	Engineer, electrician, EV developer	Fertility nurse/doctor, counsellor, midwife, zoologist, palaeontologist, ecologist, palaeobiologist	Engineer, mechanic, sports scientist, safety tester, materials scientist, sedimentologist, physical geographer, surveyor, architect			
Culturally rich – broadening horizons	Opportunities to: Discuss the use of electromagnets in EV's and link this to global warming / climate change and the availability of scarce resources (hydrocarbons and for the batteries themselves)	Opportunities to: Links to cultural ideas of contraception, gender etc	Opportunities to: Discuss changing ideas over time and cooperation between scientists Discussion linked to forces during cultural events, e.g. caber toss, husafell stone etc.			
	Summer 2					
Unit title:	Forces in balance	Variation and evolution	Adaptation, interdependence and competition			
Unit length:	Remaining 2 lessons	5 lessons	8 lessons			
Key concepts:	Understand the different types of forces as contact and non contact Understand the different types of quantities as vector and scalar Understand turning and resultant forces	Genetic diversity /biodiversity drives variation – natural selection and evolution Evolutionary processes have been discovered due to changing understanding over time How humans are able to use variation for their own ends	All organisms rely on each other for a range of biotic and abiotic factors All organisms have evolved through natural selection, gaining adaptations which increase their chances of survival Species compete with each other (and between themselves) for resources			
Knowledge/ Skills:	Key The differences between vector and scalar quantities and how these can be represented How calculate resultant force and know how to resolve a force into its perpendicular components	Key The structure of DNA Alleles and their significance Meiosis in gamete production How information is inherited and make	Key How to estimate biodiversity and population size The links between adaptation, competition and survival in a range of environments			

	The different between speed and velocity and can explain acceleration An understanding of terminal velocity and why falling objects in gases and liquids/solutions reach it Understand conservation of momentum and when to use this rule An understanding of elasticity and how to measure the stiffness of a spring How to calculate weight from given masses and gravitational field strengths Core Forces are measured in Newtons with a Newtonmeter An object is in equilibrium when the forces acting on it are in balance The unit of speed is m's Drag and frictional forces resist the movement of moving objects Whenever objects interact they exert forces on each other Tension is the force on a stretched object, more force=greater extension That the weight of an object depends upon the gravitational force exerted upon its mass Powerful Kinetic theory in chemistry	predictions of what will be inherited Selective breeding Evolution as an example of the progress of scientific thought Core The similarities and differences between mitosis and meiosis The process of reproduction as a process The definition and mechanisms of inheritance and variation Powerful Biology – reproduction, ecology etc	That resources are finite and in short supply That resources cycle through environments That decomposition is an important factor in the survival of organisms Core Individual animals and plants needing different resources from the environment Darwin's theory "survival of the fittest" Plants need the reactants of photosynthesis and mineral ions Organisms are adapted to compete in their environments How organisms reproduce Powerful Links to Photosynthesis and other Biology units Links to energy transfers (physics)			

End points covered:	Understanding of how all interactions in the Universe are reliant on forces being exchanged between two or more bodies, and that these force interactions are inextricable from the corresponding energy and momentum conservation within systems	Understanding of how organisms interact with each other and with their environment	Understanding of how organisms interact with each other and with their environment			
NC/Spec coverage:	5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.4	6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5	7.1.1, 7.1.2, 7.1.3, 7.2.1, 7.1.4			
Cross-curricular links:	Sports science Kinetic theory in chemistry Resistance / drag in biology DT	Other areas of Biology as above Sports science and health and social care	Geography Maths			
Assessments:						
Other academy intent priorities						
Curriculum Careers - Gatsby 4	Engineer, mechanic, sports scientist, safety tester, materials scientist, sedimentologist, physical geographer, surveyor, architect	Geneticist, nurse, virologist, immunologist, doctor, fertility nurse, zoologist, ecologist, environmental biologist	Ecologist, zoologist, palaeontologist, botanist, zookeeper, conservationism, planning officer			
Culturally rich – broadening horizons	Opportunities to: Discuss changing ideas over time and cooperation between scientists Discussion linked to forces during cultural events, e.g. caber toss, husafell stone etc.	Opportunities to: Discuss changing ideas over time and cooperation between scientists Discussion of the reasons for differing amounts of melanin in different countries	Opportunities to: Discussion of natural resources in different countries linked to the adaptations of their flora and fauna			