



Science 7 Year Curriculum Plan 2021-2022



Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	<p align="center">Unit 1 KS3</p> <p>Cells – Students study the building blocks of life, the cell and how it differs in organisms and why. They gain practical skills in microscopy.</p> <p>Particles and theory behaviour – Students study the particle model and how this links to material behaviour</p> <p>Forces – Students look at the world around us in terms of explaining changes in materials due to force interactions, from contact forces to non contact forces.</p> <p align="center">Assessment- End of Topic tests and formative lesson tasks</p>		<p align="center">Unit 2 KS3</p> <p>Organisation – Students study how cells work together to make organisms looking at the respiratory system .</p> <p>Substances – Students are introduced to the key terms in Chemistry the Atom, Element and Compound</p> <p>Sound and Waves – Students will look at waves and sound waves in particular to explain everyday phenomena .</p> <p align="center">Assessment- End of Topic tests and formative lesson tasks</p>		<p align="center">Unit 3 KS3</p> <p>Reproduction – Students will look at how plants and animals reproduce with a focus on the key organs and sequences in terms of the science.</p> <p>Reactions – Students will apply the knowledge learned in the previous 2 topics to a variety of different chemical reactions. and explore Acids and Alkalis</p> <p>Light and Space – Students will continue to look at waves in terms of light explaining colour, reflection and refraction. In the space topic students explore our position in the Universe</p> <p align="center">Assessment- End of Topic tests and formative lesson tasks</p>	
8	<p align="center">Unit 4 KS3</p> <p>Bioenergetics – We look at how plants use photosynthesis to transfer the suns energy to chemical energy and how Respiration allows all living organisms to then transfer this usefully</p> <p>Periodic Table – This is when we look at the elements in detail what do they have in common and how do they differ</p> <p>Particle Model – Students recap the particle model and apply it to pressure and density</p>		<p align="center">Unit 5 KS3</p> <p>Ecosystems/Adaptation- Here students will look at how organism interact in the environment and how the adapt to the surroundings over time</p> <p>Earth and Atmosphere – This is the study of how the Earth is made and how elements move around it in different natural cycles</p> <p>Forces and Motion – Speed, distance and time are looked at and simple turning moments</p> <p align="center">Assessment- End of Topic tests and formative lesson tasks</p>		<p align="center">Unit 6 KS3</p> <p>Inheritance – Students will begin to understand how we look like our biological parents and the mechanisms of inheritance</p> <p>Materials – A look in detail at the chemistry of different materials and how that links to their properties and uses.</p> <p>Space – is their anything out there and how did it all begin and other larger physics questions, this is the topic where we attempt to answer the big Why questions.</p>	

	Assessment- End of Topic tests and formative lesson tasks		Assessment- End of Topic tests and formative lesson tasks
9	<p>Unit 6 KS3 and KS3 Fundamental and Practical Skills</p> <p>Inheritance – Students will begin to understand how we look like our biological parents and the mechanisms of inheritance</p> <p>Materials – A look in detail at the chemistry of different materials and how that links to their properties and uses.</p> <p>Unit 7 -8</p> <p>Cells, Atoms and Energy fundamentals are explored with a focus on key knowledge and practical application</p> <p>Organisation, Bonding and Electricity fundamentals are explored with a focus on key knowledge and practical application</p>	<p>KS3 Fundamentals and Practical Skills</p> <p>Unit 9 -10</p> <p>Immunity, Acids and Bases, and Particle fundamentals are explored with a focus on key knowledge and practical application.</p> <p>Homeostasis, Chemical Reactions and Forces fundamentals are explored with a focus on key knowledge and practical application</p> <p>Assessment- End of Topic tests and formative lesson tasks</p>	<p>KS3 Fundamentals and Practical Skills</p> <p>Unit 11-12</p> <p>Homeostasis, Chemical Reactions and Forces fundamentals are explored with a focus on key knowledge and practical application</p> <p>Inheritance, Rates of Reaction and Motion fundamentals are explored with a focus on key knowledge and practical application</p> <p>Ecosystems, Earth, and Wave fundamentals are explored with a focus on key knowledge and practical application</p> <p>Assessment- End of Topic tests and formative lesson tasks</p>
10	<p>UNIT 2 GCSE</p> <p>Biology – Students learn of organisation within a mammal, including various different organ systems. They then learn of the organisation within a plant and finish with photosynthesis.</p> <p>Chemistry - Bonding. Students will learn the three main forms of bonding (ionic, covalent and metallic) building on their understanding of atomic structure from Unit 1. They will have to apply this knowledge to address the properties of these forms of bonding. A further application is that of carbon bonding in giant forms such as diamonds but also nanoparticles such as fullerenes and their properties and potential uses.</p> <p>Physics – Students will re look at electricity in terms of different types of circuits and different components with a focus on current. Potential difference and resistance relationships. Students will then apply this knowledge to how Mains</p>	<p>UNIT 3 GCSE</p> <p>Biology – Students study the immune system and various different pathogens. This includes the role of white blood cells and the importance of vaccination programs.</p> <p>Chemistry - Quantitative. Students will learn the ways we investigate the compounds and elements from Moles to Acids and Bases. Students will be able to make predictions about mass and apply to larger scale reactions..</p> <p>Physics – Students will study the particle nature of matter again looking closely at state changes, density and pressure. Students will recap the Atomic structure and history of the atom discovery that they covered in Chemistry in year 9. They will then look at nuclear reactions and the uses and dangers of radiation.</p> <p>Assessment- Multiple Choice , Working Scientifically, Extended answers and End of Topic tests/ PPEs</p>	<p>UNIT 4 GCSE</p> <p>Biology – Homeostasis – students learn of the importance of messaging around the body and how this affects the maintenance of a constant internal environment. Contraception and fertility are covered here.</p> <p>Chemistry - This topic is an amalgamation of linked topics to include, Metals-reactions, reactivity and extraction, Electrolysis, energy changes (exothermic and endothermic reactions, reaction profile and bond energies) and chemical analysis. It will include the Required Practical's for Electrolysis, Energy Changes (exo and endo) and Chromatography for Trilogy. For separates candidates the Required Practical for Ion Testing will also be included</p> <p>Physics – This topic looks at forces and their interactions. Students will look at vectors and scalars and develop skills in drawing vector diagrams. Students will study resultant forces, Moments, magnetism and the relationships between magnetism and electricity</p>

		electricity is supplied across the Up and in their homes Assessment- Multiple Choice , Working Scientifically, Extended answers and End of Topic tests/ PPEs		Assessment- Multiple Choice , Working Scientifically, Extended answers and End of Topic tests/ PPEs
11		<p align="center">UNIT 5 GCSE</p> <p>Biology – Students learn of inheritance and the factors that control it. This includes genetic disorders and the genetic modification of organisms for the benefit of humans.</p> <p>Chemistry - Rates of Reaction, Equilibria and Organic Chemistry. Students will actively investigate what affects the rate of a reaction looking at the four main factors. Although only Concentration is the formal Required practical, students will complete a formal write up on each of the four factors as though they are all Required Practical's. Students will then investigate what is meant by an equilibrium and apply Le Chatelier's principle to this. Finally students will look at hydrocarbons, their uses, general formula, tests for each, fractional distillation and cracking.</p> <p>Physics – Students learn about Motion in terms of speed, velocity, acceleration and distance. They look at motion in the horizontal and vertical and Newton's laws. They then go on to look at how physics has led to developments in car and road safety</p> <p align="center">Assessment- Multiple Choice , Working Scientifically, Extended answers and End of Topic tests/ PPEs</p>	<p align="center">UNIT 6 GCSE</p> <p>Biology – Students learn of the factors that govern ecosystems. They then move onto topics regarding the impact of human activities on biodiversity and how it can be preserved in the future.</p> <p>Chemistry - Earth's atmosphere and resources. Students will develop and understanding of the issues associated with the use of our planet's resources. Topics covered include: evolution of the atmosphere, combustion, acid rain and global dimming, carbon footprints, life cycle assessments, alternative forms of metal extraction, water purification (including the Required Practical: water purification), waste water and 3 Rs.</p> <p>Physics – Students look at Waves their types and properties. They then dig deeper into the electromagnetic spectrum looking at dangers and uses in details. Separate Physicists go on to study space in this topic from the Big Bang, Stars and our own Solar System</p> <p align="center">Assessment- Multiple Choice , Working Scientifically, Extended answers and End of Topic tests/ PPEs</p>	<p align="center">REVISION</p> <p>Students will revise the whole of the course with a Diagnostic Test, Therapy (where we fill in the knowledge skill gaps) and Re Test approach. This allows for a bespoke approach to every students needs in the run up to their exams</p>
12	Applied Science	<p align="center">Unit 1: Principles of Applied Science:</p> <p>Topic A: Atomic structure, periodicity, bonding and quantitative chemistry.</p> <p>Topic B: Structure and function of cells and tissues.</p>		<p align="center">Unit 2: Practical Scientific procedure and techniques.</p> <p>Topic A: Titration and colorimetry to determine concentrations of solutions.</p> <p>Topic B: Calorimetry to study cooling curves</p>

	<p>Topic C: Waves the structure properties and their application in terms of communications Assessment (End of unit tests and external Exam in Jan or June TAG for 22 Cohort)</p>	<p>Topic C: Undertake Chromatographic techniques to identify components in mixtures Topic D : Review personal development of scientific skills for laboratory work (Internal coursework 4 Assignments completed to scheduled deadlines Teaching to 22 Cohort Autumn Spring year 13 due to COVID with modifications to slim down required practicals)</p>		
<p>Biology</p>	<p>Basic Components of living Systems, Biological Molecules, Exchange surfaces and Breathing, Transport in animals and Transport in plants</p> <p>BCLS introduction to cells and microscopy techniques</p> <p>BM begin to explore the biochemistry that underpins the study of key biological disciplines</p> <p>ES&B explore the need for specialised exchange surfaces and the what makes an effective one, before looking and comparing different gas exchange surfaces in animals</p> <p>TA Explore the role of transport systems in larger organisms</p> <p>TP Be able to explain how nutrients, water and products of photosynthesis move around a plant</p> <p>Assessment (End of unit tests)</p>	<p>Enzymes, Plasma membranes, Cell Division, Classification and evolution,</p> <p>E vital for biological functions learn how enzymes are structured and how they function.</p> <p>PM knowledge of how these function is vital to know about cell processes</p> <p>CD 2 process that cells divide in detail meiosis and mitosis</p> <p>C&E look at the current and historical classification systems or organisms in relation to evolution</p> <p>Assessment (End of unit tests)</p>	<p>Biodiversity, Communicable Diseases and revision of Year 1 content</p> <p>B Learn techniques used to study habitats and the biodiversity of the planet</p> <p>CD Explore how organisms are surrounded by pathogens and how they defend themselves against them</p> <p>Assessment (End of year tests)</p>	<p>Neuronal Communication and Genetics of living systems</p> <p>NC introduced to how electronic signals are used to monitor and respond to any deviations from the body's normal state</p> <p>GoLS introduces how the genetic control of metabolic reactions determines an organism's growth, development and function</p> <p>Assessment (End of unit tests)</p>
<p>Chemistry</p>	<p>Structure and Bonding, Periodicity, Atomic Structure & Amount of Substance</p> <p>SM Looking at how different chemical bonds occur and the chemistry behind the properties.</p> <p>P The study of trends within the periodic table and how these can be explained through our understanding of the different elements.</p> <p>AS How the fundamental particles are arranged to form atoms, the basis for all matter.</p> <p>AoS How chemists can use our understanding of the mass of elements to determine the number of molecules present in a wide range of different situations.</p> <p>Assessment (End of unit tests for all terms)</p>	<p>Kinetics, Equilibrium, Haloalkanes, Intro to Organic Chemistry & Alkanes</p> <p>K The study of how quickly a reaction occurs, building of GCSE rate of reaction students will learn more about how different factors can change the rate of a reaction.</p> <p>E From understanding the concept of equilibrium to being able to predict the effects of changes to a system on the position of equilibrium. Students also learn about K_c, an expression used to determine the position of equilibrium.</p> <p>H Looking at the chemistry and reactions of haloalkanes, the introduction of the idea of nucleophiles and their substitution reactions.</p>	<p>Alkenes, Alcohols, Organic Analysis, Redox Reactions, Group 2 & Group 7</p> <p>Alk The chemistry of alkenes and carbon to carbon double bonds. Students will learn about addition reactions of alkenes and how they are used to form polymers.</p> <p>Alc From the different ways of producing ethanol and the ethics behind them to how the chemistry of the –OH functional group can be used to form different desired compounds.</p> <p>OC How both experimental and instrumental methods can be used to enable chemists to identify the structures of unknown organic compounds.</p>	

		<p>ItOC What is organic chemistry and why is it so vitally important? Students learn how to name molecules correctly as well as looking at the idea of isomerism.</p> <p>A What are alkanes and how are they obtained. This topic builds on GCSE knowledge going into further detail about these massively important molecules.</p>	<p>RR Students learn about the key concept of electron transfer within chemistry and how it drives reactions to occur.</p> <p>G2 The trends within group 2 as well as the chemistry of the elements and their uses.</p> <p>G7 The trends within group 7, the chemistry of the halogens and the halide ions as well as the uses of chlorine.</p>	
Health and Social Care	<p>Unit 1: Human Lifespan Development</p> <p>Topic A: Human growth and development through the life stages. – explore physical, Intellectual, emotional and social development across the life stages,</p> <p>Topic B: Factors affecting human growth and development. – the nature/nurture debate by looking at genetic, environmental, economic and social factors that affect human growth and development</p> <p>Topic C: Effects of ageing – looking in detail at the physical changes, psychological change and societal effects of an ageing population</p> <p>Assessment (End of unit tests and external Exam in Jan or June TAG for 22 Cohort)</p>	<p>Unit 5: Meeting Individual Care and Support Needs</p> <p>Topic A: Examine principles, values and skills which underpin meeting the care and support needs of individuals A1 Promoting equality, diversity and preventing discrimination A2 Skills and personal attributes required for developing relationships with individuals A3 Empathy and establishing trust with individuals</p> <p>Topic B: Examine the ethical issues involved when providing care and support to meet individual needs B1 Ethical issues and approaches B2 Legislation and guidance on conflicts of interest, balancing resources and minimising risk</p> <p>Topic C: Investigate the principles behind enabling individuals with care and support needs to overcome challenge C1 Enabling individuals to overcome challenges C2 Promoting personalisation C3 Communication techniques</p> <p>Topic D: Investigate the roles of professionals and how they work together to provide the care and support necessary to meet individual needs.</p> <p>(Internal Assignments completed to schedule Teaching to 22 Cohort Autumn Spring year 13 due to COVID)</p>		
Physics	<p>Foundations of Physics, Forces and Motion Part 1 and Electrons, Waves and photons Part 1</p> <p>FP Students learn the basic quantities, and units of the course along with skills required to solve vector and scalar problems.</p> <p>F&M Students look at motion closely in terms of graphs, free fall and projectiles. They then look at Forces in terms of equilibrium and Moments in triangles of forces</p> <p>E, W&P Students look at Charge in terms of Kirchhoff's first law and drift velocity. They then move on to electron in circuits, electromotive force, electron guns and resistivity</p> <p>Assessment (End of unit tests)</p>	<p>Forces and Motion Part 2 and Electrons, Waves and photons Part 2</p> <p>F&M Students look at work and its links to energy and power. Students look at the physics of material properties linked to the use of the material.</p> <p>E,W&P Students look at the rest of Kirchhoff's laws and how electrical sensors are built and work. Students then move onto waves and look at their properties, refraction, reflection, diffraction, interference and polarisation</p> <p>Assessment (End of unit tests)</p>	<p>Forces and Motion Part 3 and Electrons, Waves and photons Part 3</p> <p>F&M Students look at Newton's Laws and Impulse applying them to collisions in 2 dimensions.</p> <p>E,W&P Students look at Quantum physics with the photon and Einstein's photoelectric effect and the Wave-particle duality</p> <p>Assessment (End of unit tests)</p>	<p>Revision</p> <p>End of year exam</p> <p>Start Simple - Harmonic motion and Kinetic theory linked to thermal energy</p> <p>Assessment (End of year tests)</p>

13	Applied Science	<p>Unit 3: Scientific Investigation skills.</p> <p>Topic A- C: Working Science Skills which will be applied to following topics and experiments</p> <p>Topic D: Enzymes</p> <p>Topic E: Diffusion</p> <p>Topic F: Plants</p> <p>Topic G: Energy Contents of Fuel</p> <p>Topic H: Electrical Circuits</p> <p>(External practical exam (modified due to COVID Jan 2022 taught in summer spring lock down to 22 cohort)</p>	<p>Unit 8: Physiology of Human Body Systems</p> <p>Topic A: Understand the impact of disorders of the musculoskeletal system and their associated corrective treatments</p> <p>Topic B: Understand the impact of disorder on the physiology of the lymphatic system and the associated corrective treatment.</p> <p>Topic C: Explore the physiology of the digestive system and the use of corrective treatment for nutritional deficiency</p> <p>(Internal Assignments completed to schedule amendments of 1 learning aim assessed due to COVID for 22 cohort)</p>	<p>Assignment completion and Revision for Resits of Unit 1 and 2 if required</p>	
	Biology	<p>Biodiversity, Communicable Diseases</p> <p>B Learn techniques used to study habitats and the biodiversity of the planet</p> <p>CD Explore how organisms are surrounded by pathogens and how they defend themselves against them</p> <p>Neuronal Communication and Genetics of living systems</p> <p>NC introduced to how electronic signals are used to monitor and respond to any deviations from the body's normal state</p> <p>GoLS introduces how the genetic control of metabolic reactions determines an organisms growth, development and function</p> <p>Assessment (End of unit tests)</p>	<p>Hormonal Communication, Homeostasis, Plant Response, Patterns of Inheritance, Manipulating Genomes, and Cloning and Biotechnology</p> <p>HC look at how specific hormones bring about their effect with case studies on Diabetes, the kidneys and the liver</p> <p>H and PR compare and contrast how the status quo is managed in plants and animals. And how it can be exploited by humans</p> <p>PI study how genetics and environmental factors contribute to variation within a population</p> <p>MG look into the potential benefits but also the ethics that surround this</p> <p>C&B explore how farmers exploit natural vegetative propagation and the role of scientists in the production of artificial plant an animal clones</p>	<p>Energy for Biological Processes, Respiration, Ecosystems and Population Sustainability</p> <p>EfBP look into this complex process and how it is used to drive the production of chemicals like ATP</p> <p>R study the series of enzyme driven reactions that provide the immediate source of energy for biological processes</p> <p>E Look at the complex interactions between organisms and abiotic and biotic factors</p> <p>P&S investigate factors that affect population size and the economic, ethical, and social reasons why some ecosystems may need to be managed</p> <p>Assessment (End of unit tests)</p> <p>Revision in preparation for final exams.</p>	

		Assessment (End of unit tests)	
Chemistry	<p>Nomenclature and Isomerism, Carbonyl Chemistry, Thermodynamics, KP, Periodicity, Acids, Bases and Buffers, Amines & Polymers</p> <p>N&I introduces key new organic functional groups and the concept of optically active molecules.</p> <p>CC Looking at aldehydes and ketones in more detail as well as carboxylic acids and ester and learning about acylation reactions.</p> <p>T Building on Hess's Law from Y12, students learn about Born-Haber cycles and the factors affecting Lattice Energy as well as the new concept of Gibbs free energy and entropy.</p> <p>KP Building on Y12 Kc students learn about how the equilibrium of gaseous reactions can be manipulated.</p> <p>Pe Building on Y12, students now look at the reactions of period 3 elements and their oxides.</p> <p>AB&B Learning about different type of acid and base. What really is the pH scale, more work on titrations and a new concept of Buffer solutions and how they can be made for specific pHs.</p> <p>A The chemistry of nitrogen and its role in organic chemistry and synthesis.</p> <p>Po How condensation polymers</p>	<p>Kinetics and Rate, Aromatic Chemistry, Organic Synthesis, Biochemistry, Electrochemistry & Transition Metals</p> <p>R&R Introducing the concept of orders of reaction, how to determine the rate determining step and studying the Arrhenius equation and how activation energy can be calculated.</p> <p>AC the chemistry of Benzene, from solving the mystery of its structure to manipulating its chemistry through electrophilic and Friedel-Crafts reactions.</p> <p>OS Piecing together all of the organic topics studied at A-Level to devise synthetic routes to create desired compounds.</p> <p>B The chemistry of biological molecules, how IMFs play a vital role in DNA, the structure of biological molecules and how the anticancer drug cisplatin works.</p> <p>E How redox reactions can be manipulated to produce a flow of electrons than can be used to create cells and batteries.</p> <p>TM From the general behaviour of TMs to the chemistry of specific metals such as vanadium.</p>	<p>Structural Determination, Chromatography & Inorganic Aqueous Reactions</p> <p>SD How both practical and instrumental methods can be used to identify the structure of even complex unknown organic molecules.</p> <p>C The theory behind how this simple but incredibly useful technique and its wider applications.</p> <p>IAR introduction of the idea of ligands and ligand exchange to form different complexes.</p> <p>Revision in preparation for final exams.</p>
Health and Social Care	<p>Unit 2: Working in Health and Social Care</p> <p>Topic A: The roles and responsibilities of people that work in the health and social care sector - Professional viits/talks and link to Work experience</p>	<p>Unit 14: Physiological disorders and their care</p> <p>Topic A: Investigate the cause and effects of physiological disorders</p> <p>Topic B: Examine the investigation and diagnosis of physiological disorders</p>	<p>Assignment completion and Revision for Resits of Unit 1 and 2 if required</p>

	<p>Topic B: The roles of organisations in the health and social care sector</p> <p>Topic C: Working with people with specific needs in the health and social care sector – specific needs and practices</p> <p>(External exam Jan year 13 or June Taught to 22 Cohort in 2021 lock down)</p>		<p>Topic C: Examine treatment and support for service users with physiological disorders</p> <p>Topic D: Develop a treatment plan for service users with physiological disorders to meet their needs</p> <p>(Internal Assignments completed to schedule Taught to 22 Cohort Summer of year 12 and assessed as part of TAG grades)</p>			
<p>Physics</p>	<p>Recap of Forces in Motion and Newton's laws and Electron and waves</p> <p>Start Simple - Harmonic motion and Kinetic theory linked to thermal energy</p> <p>Assessment (End of year tests)</p>	<p>Kinetic theory & Circular motion</p> <p>KT students learn about that laws that govern ideal gases</p> <p>CM students look at angular velocity and acceleration and centripetal forces</p> <p>Assessment (End of unit tests)</p>	<p>Fields & Space</p> <p>F Students look at gravitational fields and apply Netwn's laws and Kepler's laws to different situations</p> <p>S Students look closer at stars and energy levels with detail on astronomical distances and Hubble's law and the Big Bang</p> <p>Assessment (End of unit tests)</p>	<p>Capacitance, Electric & Magnetic Fields</p> <p>C How they work in circuits and how the charge and discharge</p> <p>E&MF Look at Coulomb's law and how charged particles behave in electric fields. How charged particles behave and Faraday's law and Lenz's law</p> <p>Assessment (End of unit tests)</p>	<p>Radioactive Decay & Medical Physics</p> <p>RD We look at Rutherford's work and inside the atomic nucleus with modeling of radioactive decay. Students then study $E=mc^2$, fission and fusion.</p> <p>MP X-Rays, CAT scans, Gamma Camera, PET cans, Ultrasound and Dopler imaging</p> <p>Assessment (End of unit tests)</p>	<p>REVISION</p>