RUSKIN Community High School

Science Curriculum Overview

Year	Stage 1	Stage 2	Stage 4	Stage 4	Stage 5	Stage 6	Fundamental Learning
7	Science Skills: Safety & Equipment Organisms: Movement & Cells Careers - Biology PSHCE - Safety	Matter: Particle Model & Separating Mixtures Forces: Speed & Gravity	Reactions: Metals & Non-Metals; Acids & Alkalis Electromagnets; Voltage, Resistance & Current Careers – Chemistry	Genes: Variation & Human Reproduction Energy: Energy Costs & Energy Transfer PSHCE – puberty, reproduction & diversity	Earth: Earth Structure & Universe Waves: Sound & Light Careers – Physics	Ecosystems: Interdependence & Plant Reproduction Science Skills: Carrying Out an Effective Scientific Investigation	
	Students transition into secondary science & capitalise on their excitement as they develop a range of beginner skills such as using a microscope, lighting a Bunsen burner & communicating like a scientist. They will build on KS2 knowledge of organisms through the study of the skeletal & muscular systems & cells & organisation.	In this stage, students expand upon their KS2 knowledge of matter & forces. They explore various topics such as materials, water, dissolving, separating mixtures, distillation, air composition, chromatography, & modelling mixtures. Additionally, they learn how to calculate speed & acceleration as well as exploring the concepts of resultant forces & gravity.	Students build on KS2 knowledge of reactions & electricity by studying properties of metals & non-metals, types of reactions, acids & alkalis, as well as electric circuits & electrostatic forces.	Students build on KS2 knowledge of genes & energy by studying variation & human reproduction, energy stores & transfers, fuels as energy stores, energy in the home & the cost.	Students build on KS2 knowledge of the Earth & Universe through the study of the rock cycle, the Earth in the Universe as well as exploring the science behind how sound & light waves interact with the world around us.	Students build on KS2 knowledge of interdependence & plant reproduction by studying relationships in the environment. Students will transition out of Year 7 by practicing & honing core investigative skills necessary for future success in scientific learning. Lessons cover topics such as understanding theories, collecting data, identifying variables, making predictions, assessing reliability, & displaying results.	These topics allow students to work scientifically, develop practical skills, collect & analyse data as well as carry out simple calculations. They also allow students to develop their understanding of how scientific knowledge & understanding has improved over time & the use of models. Students will be given opportunities to improve literacy through reading for understanding, spellings of key words, as well as developing independent skills, collaborative skills & presentation skills

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8	Forces: Contact Forces & Pressure Matter: Periodic table & Elements Careers – physics	Organisms: Breathing & Digestion Electromagnets: Magnetism & electromagnetism PSHCE - Health	Reactions: Chemical energy & Types of reaction Ecosystems: Respiration & Photosynthesis Careers – chemistry	Energy: Work & Heating & Cooling Earth: Climate & Earth Resources	Genes: Evolution & inheritance Waves: Wave effects & properties Careers – Biology PSHCE - Diversity	Science Skills: Project based learning; "big question"	
	Students build on Y7 work on forces & matter themes by studying the effects of forces in addition to exploring the periodic table, elements, & compounds.	Students build on Y7 work on organisms by studying the breathing & digestive systems followed as well as magnets & electromagnets.	Students build on Y7 work on reactions & ecosystems by investigating different types of chemical reaction as well as exploring aerobic & anaerobic respiration & photosynthesis & how they are linked in ecosystems.	Students build on Y7 work on energy & Earth by studying machines, work done, thermal energy, carbon cycle & the changing Earth.	Students build on Y7 work on genes & waves through the study of DNA, inheritance, natural selection & evolution followed by wave energy & their effects.	Students will work on an enquiry-based project where they will research/investigate a "big question" that helps to put science into a real-life context as well as helping to hone fundamental science skills needed to succeed in year 9 and beyond.	Students continue to develop their knowledge base, working scientifically, practical skills, collecting & analysing data as well as carrying out calculations. They also continue to develop their understanding of how scientific knowledge & understanding has improved over time & the use of models. Students will continue to improve literacy through reading for understanding, spellings of key words & use of scientific language.

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9	Science Skills: Transition to GCSE – general Science Science Skills: Transition to GCSE - Biology	Science Skills: Transition to GCSE – Chemistry Science Skills: Transition to GCSE - Physics	Science Skills: Project based learning; "big question"	Organisms: Transition to GCSE – Cell Biology	Matter: Transition to GCSE - Atomic Structure & the Periodic Table	Energy: Transition to GCSE - Energy	
	Students will kick start their transition from KS3 to GCSE science by undertaking a carefully designed unit using familiar concepts from year 7 & 8 to hone their investigative skills whilst extending their biology, chemistry & physics knowledge on topics such as plants, sound, pressure & light. They will then study a bespoke biology transition unit to develop the underpinning literacy & numeracy skills required to succeed at GCSE level.	Students will study bespoke chemistry & physics transition units to develop the underpinning literacy & numeracy skills required to succeed at GCSE level building on year 7 & 8 chemistry & physics key themes.	Students will apply their science skills & knowledge from this year and develop it further by working on an enquiry-based project where they will research/investigate a "big question" that helps to put science into a real-life context.	Students will continue their study on the theme of organisms by reviewing their year 7 topic on the intricate structure of cells & extending their understanding to cover cell division & transport processes. Students will continue to refine & develop essential microscopy skills here encountered earlier in their Ruskin science journey.	This stage of year 9 aims to equip students with the necessary foundation for the study of Chemistry in Year 10 under the guidance of subject specialist teachers. It involves a comprehensive review of atomic structure & the periodic table, followed by a deeper exploration of the atomic structure's role in understanding reactivity & bonding concepts.	This stage is designed to lay a solid foundation for students as they embark on the study of Physics in Year 10 under the guidance of subject specialist teachers. It involves a progression from KS3 knowledge of energy, delving into topics such as energy stores & systems, specific heat capacity, methods to reduce heat transfer, efficiency, & exploration of both renewable & non-renewable energy resources.	Students continue to develop based skills developed at KS3, working scientifically, practical skills, collecting & analysing data as well as carrying out calculations. They also continue to develop their understanding of how scientific knowledge & understanding has improved over time & the use of models. Students will continue to improve literacy through reading for understanding, spellings of key words & use of scientific language.

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10	ORGANISMS: Organisation MATTER & REACTIONS: Bonding, Structure & the Properties of Matter ELECTROMAGNETS: Electricity	ORGANISMS: Infection & Response MATTER: Quantitative Chemistry ENERGY: Particle Model of Matter	ORGANISMS: Bioenergetics REACTIONS: Chemical Changes ENERGY: Atomic Structure – models	ORGANISMS: Homeostasis & Response REACTIONS: Energy Changes ENERGY: Atomic Structure - radiation	GENES: Inheritance, Variation & Evolution REACTIONS: Rates of reaction FORCES A: Different Types of Forces	GENES: Inheritance, Variation & Evolution REACTIONS: Organic Chemistry FORCES B: Speed & Acceleration	
	KS3 concepts of organisation of plants and animals are revisited and developed here with topics covered including gas exchange systems, digestion, transport systems and non-communicable diseases. In this stage of year 10, students also build on KS3 matter themes to explore the intricacies of matter and the existence of the bonds that hold everything together. A study of electrical circuits and types of currents develops circuit knowledge gained at KS3.	Students will use their prior learning on organisms and cells to study how organisms are affected by, give rise to and respond to communicable diseases. KS3 energy themes are used to explore density and temperature change in matter.	Students will develop their understanding of respiration and photosynthesis as chemical processes fundamental to life as well as studying chemical reactions in non-biology scenarios. Previously met topics such as metals, salts and electrolysis will be revisited in more detail at this stage. Learning will also take place based on models of the atom to build upon the KS3 theme of matter.	KS3 themes of organisms, matter & forces underpin study in this stage about control in living organisms, including the nervous system & hormonal control. In this stage, students will also learn about energy changes in chemical reactions. The cause and effects of radiation are studied.	Students build on KS3 knowledge of inheritance, variation & evolution & fossil fuels, comparing mitosis & meiosis as well as exploring the rate & extent of chemical changes, investigating factors that influence reaction rates & equilibrium. Students will develop their understanding of forces, including types of forces, their effects, & their application in new contexts.	Students continue to build on build on KS3 knowledge of inheritance, variation & evolution & fossil fuels, learning how to construct & interpret genetic diagrams, followed by an in-depth look at hydrocarbons. Additionally, students will study forces related to speed & acceleration, examining concepts such as Newton's laws & the relationship between force, mass, & acceleration.	Students continue to develop based skills developed at KS3, working scientifically, practical skills, collecting & analysing data as well as carrying out calculations. They also continue to develop their understanding of how scientific knowledge & understanding has improved over time & the use of models. Students will continue to improve literacy through reading for understanding, spellings of key words & use of scientific language.

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11	ECOSYSTEMS: Ecology MATTER: Chemical analysis WAVES: Waves	REACTIONS: Chemistry of the Atmosphere ELECTROMAGNETS: Magnetism and Electromagnetism	EARTH: Using Resources	Review Paper 1 & Paper 2 Topics	Revision		
	In this stage, students will use KS3 learning on ecosystems, matter, and waves to explore the dynamic field of ecology, studying ecosystems, interdependence, and environmental impact. Students will gain a comprehensive understanding of chemical analysis, including qualitative and quantitative techniques, identification of substances, and interpretation of experimental data. Students will also investigate waves and light, understanding their behaviour, properties, and applications in various contexts such as optics and communication systems.	In this stage, students will revisit themes of reactions and electromagnetism. Students will gain a comprehensive understanding of chemical analysis, including qualitative and quantitative techniques, identification of substances, and interpretation of experimental data. They will also explore the relationship between electricity and magnetism, electromagnetic induction, and the applications of electromagnetism in various technologies.	During this stage, students will revisit the Earth theme to explore sustainable development more deeply, investigating concepts such as renewable energy, resource management, & environmental impact. Additionally, students will engage in comprehensive revision of the remaining biology & physics content, reinforcing their knowledge & preparing for assessment and further study in these subjects.	Students will embark on a comprehensive review of the entire curriculum, encompassing Paper 1 & Paper 2, ensuring a thorough grasp of the subject matter.	During the final stage of the Ruskin Science journey, students will engage in targeted revision, focusing on the specific areas of the GCSE science curriculum where they require further consolidation & understanding in preparation for their GCSE assessments.		Students will continue to develop skills taught throughout KS3 & KS4, with a focus on improving revision skills & exam technique in preparation for final GCSE exams.