



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



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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	Health: Diet and digestion  Science Skills: Project based learning; “big question”	
	<p>Students build on Y7 work on forces &amp; matter themes by studying the effects of forces in addition to exploring the periodic table, elements, &amp; compounds.</p>	<p>Students build on Y7 work on organisms by studying the breathing &amp; digestive systems followed as well as magnets &amp; electromagnets.</p>	<p>Students build on Y7 work on reactions &amp; ecosystems by investigating different types of chemical reaction as well as exploring aerobic &amp; anaerobic respiration &amp; photosynthesis &amp; how they are linked in ecosystems.</p>	<p>Students build on Y7 work on energy &amp; Earth by studying machines, work done, thermal energy, carbon cycle &amp; the changing Earth.</p>	<p>Students build on Y7 work on genes &amp; waves through the study of DNA, inheritance, natural selection &amp; evolution followed by wave energy &amp; their effects.</p>	<p>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.</p>	<p>Students continue to develop their knowledge base, working scientifically, practical skills, collecting &amp; analysing data as well as carrying out calculations. They also continue to develop their understanding of how scientific knowledge &amp; understanding has improved over time &amp; the use of models.</p> <p>Students will continue to improve literacy through reading for understanding, spellings of key words &amp; use of scientific language.</p>





Year	Fundamental Learning						
9	Stage 1	Stage 2	Stage 4	Stage 4	Stage 5	Stage 6	
	ORGANISMS: Cells & DNA	ENERGY: Types and resources	REACTIONS: Chemical reactions	ORGANISMS: Health and the digestive system	LECTROMAGNETS: Electricity	REACTIONS: Environmental chemistry	
	MATTER: The periodic table	ORGANISMS: Disease and the body's defences	ENERGY: States of matter	REACTIONS: Exothermic and endothermic reactions	ORGANISMS: Photosynthesis and respiration	ENERGY: Radioactivity	
	<p>Students will build on their knowledge of cells from year 7 with further examples of eukaryotic cells and the introduction of prokaryotic cells. Students will further their knowledge of the periodic table with the introduction of atomic structure and further separating techniques.</p>	<p>Students will build on energy types with the introduction of power and efficiency calculations. Evaluating renewable and non-renewable energy resources. Students will also look at diseases and the body's defences to fight disease. Practical work involving aseptic techniques.</p>	<p>Students will build on their year 7 knowledge of acids and alkalis to look further at the reactions of acids with the introduction of writing chemical equations. Students will also further their knowledge of states of matter studied in year 7 to density of irregular objects and specific latent heat energy.</p>	<p>Students will learn further about the enzymes involved in digestion including food testing. Students will also be able to define reactions as endothermic or exothermic with the introduction of practical techniques to measure this.</p>	<p>Students will further their knowledge of series and parallel circuits with the introduction of resistance and domestic electricity. Students will also look further into leaf structure and factors that can affect photosynthesis.</p>	<p>Students will build on KS3 knowledge of global warming to look at how the composition of the atmosphere has developed over time. Students will also be able to calculate their carbon footprint. Students will build on the atomic structure knowledge at the start of year 9 to introduce radioactivity.</p>	<p>Students continue to develop their knowledge base, working scientifically, practical skills, collecting &amp; analysing data as well as carrying out calculations. They also continue to develop their understanding of how scientific knowledge &amp; understanding has improved over time &amp; the use of models.</p> <p>Students will continue to improve literacy through reading for understanding, spellings of key words &amp; use of scientific language.</p>





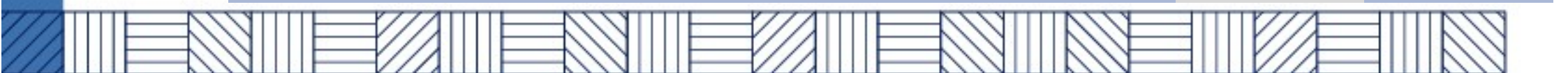
Year	Fundamental Learning					
10	<b>Stage 1</b> <b>Organisms:</b> Cell Biology  <b>Matter:</b> Atomic Structure & the Periodic Table  <b>Energy:</b> Energy	<b>Stage 2</b> <b>ORGANISMS:</b> Organisation  <b>MATTER &amp; REACTIONS:</b> Bonding, Structure & the Properties of Matter  <b>ELECTROMAGNETS:</b> Electricity	<b>Stage 4</b> <b>ORGANISMS:</b> Infection & Response  <b>MATTER:</b> Quantitative Chemistry  <b>ENERGY:</b> Particle Model of Matter	<b>Stage 4</b> <b>ORGANISMS:</b> Bioenergetics  <b>REACTIONS:</b> Chemical Changes  <b>ENERGY:</b> Atomic Structure – models	<b>Stage 5</b> <b>ORGANISMS:</b> Homeostasis & Response  <b>REACTIONS:</b> Energy Changes  <b>ENERGY:</b> Atomic Structure – radiation	<b>Stage 6</b> <b>GENES:</b> Inheritance, Variation & Evolution  <b>REACTIONS:</b> Rates of reaction  <b>FORCES A:</b> Different Types of Forces
	<p>Students will build on prior knowledge of cells to understand cell division and cell transport further. In this stage students will also explore the groups of the periodic table in more detail. It also involves a progression from KS3 knowledge of energy, delving into topics such as energy stores &amp; systems, specific heat capacity, methods to reduce heat transfer, efficiency, &amp; exploration of both renewable &amp; non-renewable energy resources.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>	<p>KS3 themes of organisms, matter &amp; forces underpin study in this stage about control in living organisms, including the nervous system &amp; hormonal control. In this stage, students will also learn about energy changes in chemical reactions. The cause and effects of radiation are studied.</p>	<p>Students build on KS3 knowledge of inheritance, variation &amp; evolution &amp; fossil fuels, comparing mitosis &amp; meiosis as well as exploring the rate &amp; extent of chemical changes, investigating factors that influence reaction rates &amp; equilibrium. Students will develop their understanding of forces, including types of forces, their effects, &amp; their application in new contexts</p>
						<p>Students continue to develop their knowledge base, working scientifically, practical skills, collecting &amp; analysing data as well as carrying out a wider range of calculations. They also continue to develop their understanding of how scientific knowledge &amp; understanding has improved over time &amp; the use of models.</p> <p>Students will continue to improve literacy through reading for understanding, spellings of key words &amp; use of scientific language</p>







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11	<p><b>GENES:</b> Inheritance, Variation &amp; Evolution</p> <p><b>REACTIONS:</b> Organic Chemistry</p> <p><b>FORCES B:</b> Speed &amp; Acceleration</p>	<p><b>ECOSYSTEMS:</b> Ecology</p> <p><b>MATTER:</b> Chemical analysis</p> <p><b>WAVES:</b> Waves</p>	<p><b>REACTIONS:</b> Chemistry of the Atmosphere</p> <p><b>EARTH:</b> Using Resources</p> <p><b>ELECTROMAGNETS:</b> Magnetism and Electromagnetism</p>	Review Paper 1 & Paper 2 Topics	Revision		
	<p>Students continue to build on build on KS3 knowledge of inheritance, variation &amp; evolution &amp; fossil fuels, learning how to construct &amp; interpret genetic diagrams, followed by an in-depth look at hydrocarbons. Additionally, students will study forces related to speed &amp; acceleration, examining concepts such as Newton's laws &amp; the relationship between force, mass, &amp; acceleration.</p>	<p>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.</p>	<p>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.</p>	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 procedural knowledge that has been developed throughout KS3 & KS4, with a focus on improving revision skills & exam technique in preparation for final GCSE exams.





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