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Year 7 – Science

Module/Unit of Learning	Taught During	What will students learn?	How does this help to build a broad and strong foundation?	Links to other subjects
Introduction to Science	September	Introduction to Science establishes the foundations for students' entire five-year science journey, particularly the skills and habits needed to work scientifically. Students begin to develop skills in observation, measurement, data collection, graphing, drawing conclusions, evaluating evidence and working safely, which are revisited and progressively developed in every subsequent year	In **Year 8**, these skills are applied through practical investigations such as chemical reactions, electricity and the respiratory system. In **Year 9**, students use them to investigate topics including cell biology, energy, radiation and ecology. In **Year 10**, the same skills underpin increasingly quantitative and analytical investigations across all three scientific disciplines. **Year 11** requires students to apply them independently when interpreting experimental data, evaluating methods and answering unfamiliar practical questions.	Maths
Particle Model and Separating Techniques	September-October	**Particle Model and Separation Techniques** introduces students to one of the most important conceptual models in science: that matter is made from particles. Students explore the properties and arrangement of particles in **solids, liquids and gases**, changes of state, physical changes and the conservation of mass. They distinguish between **atoms, elements, compounds and mixtures**, and develop an understanding of pure and impure substances. Students then apply these ideas through **solubility, filtration,**	In **Year 8**, the particle model will be revisited, focussing on gases and diffusion. Knowledge of atoms, elements and compounds will be re-activated. In **Year 9**, this will be reactivated linking particle model to cell transport, density, internal energy, specific heat capacity and specific latent heat. Students will also recall their knowledge of separation techniques to make soluble salts, chromatography and fractional distillation. In **Year 10**, knowledge of both the particle model and atoms, elements and compounds will be applied to bonding,	Maths

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		evaporation, crystallisation, distillation and chromatography, including practical applications such as crime-scene investigation.	quantitative techniques, rates and waves In **Year 11**, these topics will be holistically studied to embed knowledge further	
Human Body	November-December	**Human Body** establishes the biological concept that the cell is the fundamental unit of living organisms. Students observe and compare **animal and plant cells**, developing an understanding of sub-cellular structures. They compare **bacterial cells with eukaryotic cells**, consider specialised cells and develop the organisational hierarchy from **cells to tissues, organs, organ systems and organisms**. The module also introduces human reproduction, including the male and female reproductive systems, puberty, the menstrual cycle, gametes, fertilisation and gestation. Students are introduced to **DNA and its role as genetic material**, alongside the historical development of our understanding of DNA.	In **Year 8**, animal cell knowledge will be reactivated during the respiratory system and digestive system module and using microscopes to study animal and plant cells. In **Year 9,** the fundamentals will be reactivated and expanded into the cardiac system, respiratory system, digestive system and enzymes and the immune system. In **Year 10**, students will link their knowledge to inheritance and the nervous and endocrine systems. This will involve recalling and developing knowledge of DNA structure, inheritance and reproduction. In **Year 11**, these topics will be holistically studied across both biology paper 1 and 2.	Life (PSHE) PE
Energy	December	**Energy** introduces students to the idea that energy is conserved and can be transferred between different stores and pathways. Students identify key **energy stores** and consider how energy is transferred between systems. They begin to use equations to calculate **kinetic energy and gravitational potential energy**,	In **Year 8**, the topic of electricity is introduced with links to potential difference and energy transfers. In **Year 9,** the fundamentals of the energy module will to be reactivated from year 7 and knowledge expanded further into looking at energy calculations, stores, transfers and conservation.	Maths

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		providing an early introduction to the mathematical modelling that becomes increasingly important throughout their 5 year science journey. Students also explore energy transfers in the home and the mechanisms of **conduction, convection and radiation**.	In **Year 10**, energy is not studied directly but strong links are made between energy and electricity, endothermic and exothermic reactions, waves and forces. In **Year 11**, energy concepts will be studied holistically, and string links will be made to electricity concepts	
Health	January-February	**Health** develops students' understanding of how diet and lifestyle affect health. Students investigate the components of a **healthy and balanced diet**, consider the energy content of foods and use calculations to compare energy supplied by different foods. They explore how an unhealthy diet can contribute to **obesity** and examine the effects of **smoking and alcohol** on the body and long-term health. The module also builds students cultural capital: knowledge of the effects of issues such as smoking, drugs and alcohol.	In **Year 8,** students will cover respiratory system and digestive system module, reactivating and expanding their understanding of the importance of a healthy diet and energy stored within foods. Later in the year they also cover energy which links back to energy in food. They will design practicals to test the energy content within food, that links back to their introduction to science module. In **Year 9**, students cover health in infection and response as well as factors affecting diffusion (alveoli and exchange surfaces) and the circulatory system. This will reactivate and expand knowledge surrounding the importance of a healthy lifestyle and its impact on the respiratory and circulatory systems. They will also look at how lifestyle factors can increase your risk of non-communicable diseases. They will also be taught how to recognise how issues and damage to the respiratory and circulatory system will affect their overall health. In **Year 11**, they link it all together holistically in biology paper 1	Life (PSHE)

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Forces	February-March	**Focres** aims to build upon knowledge of forces and gravity from KS2. Students will be taught how to distinguish between **contact and non-contact forces**, represent balanced and unbalanced forces using **free-body force diagrams**, and investigate friction. They distinguish between **mass and weight**, explore elastic forces and spring extension, and begin using measurements and equations to calculate **speed**. Students also consider reaction time and apply their understanding of forces and pressure to real-world contexts such as climbing Mount Everest and diving underwater.	In **Year 8**, students will study magnets, where they will recall and expand their knowledge of the interactions of non-contact forces and how understanding magnetic force is important for a range of things in the world around us, like compasses and electromagnets. In **Year 9**, Students study energy transfers and one of the ways energy is transferred is by a force. Within the energy module, students also cover Hooke's law required practical where knowledge of weight and mass is important. This will also require them to recall skills from their introduction to science module, by planning and carrying out investigations. In **Year 10**, students will study atomic structure and bonding, which requires them to understand how electrostatic forces of attraction are involved in both the structure of atoms and a range of ionic and covalent compounds, giving them a range of different properties. Students will also re-activate and expand their knowledge of magnetism, directly linking to the core concept of forces that students are taught in year 7. Year 10 students will also do an entire topic on forces, where they expand their knowledge surrounding the interactions of forces, develop their mathematical skills of calculations involving the interactions of forces, and have the opportunity to apply this understanding to the everyday concepts around them, like the thinking and	

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			braking distance involved in stopping vehicles. In **Year 11**, students cover holistically in Physics paper 1 and paper 2	
The Periodic Table	March	**The Periodic Table** introduces students to the organisation of the elements and begins to explain why elements have different properties. Students learn about **atomic structure**, navigate the Periodic Table and investigate how **Mendeleev** developed his classification system. They distinguish between **metals and non-metals**, investigate alloys and relate properties to uses, and explore melting and boiling points. Students are then introduced to the characteristic properties and reactivity of **Group 1 alkali metals, Group 7 halogens and Group 0 noble gases**.	In **Year 8**, students will use the knowledge of atoms and the periodic table to apply to chemical reactions such as displacement reactions. In **Year 9**, students will revisit properties of groups, but build in explanations in terms of electron structure, as well as oxidation and reduction reactions, other chemical reactions. In **Year 10**, students will use their understanding of Mendeleev and the periodic table to apply to quantitative chemistry, explaining bonding and chemical changes. They will also continue to develop their understanding when they study organic chemistry, and linking structure to properties of different hydrocarbons. In **Year 11**, these topics will be holistically studied to embed knowledge further, building in different contexts and applications to the topics taught previously to prepare for Chemistry Paper 1.	
pH	April	**pH** introduces students to the chemical behaviour of **acids and alkalis** and develops their ability to use evidence and practical measurements to investigate chemical substances. Students learn how the **pH scale** describes acidity and alkalinity and apply this understanding to real-	In **Year 8**, students will study chemical reactions, including neutralisation, where understanding of the pH scale is vital. In **Year 9,** students will study chemical analysis and using resources, which will require them to apply their knowledge of the pH scale to identify unknown substances. They will also link it to pollution and	

		world contexts, such as investigating a potential sewage outbreak. They investigate soil samples and consider how filtration can be used when preparing samples for testing. Students then explore **neutralisation**, learn how salts are formed and develop the ability to name salts produced in acid–alkali reactions.	acid rain, being able to expand their knowledge to explain why acid rain forms and the implications of this on the environment. In **Year 10**, they will look at the periodic table, which requires them to re-activate and expand their knowledge of the pH scale by looking at the ions that cause acidity and alkalinity, as well as using pH to group 1 reaction. In **Year 11**, these topics will be holistically studied to embed knowledge further, building in different contexts and applications to the topics taught previously to prepare for chemistry Paper 1 and 2.	
Life on our Planet	April-May	**Life on Our Planet** develops students' understanding of how living organisms obtain energy, interact with one another and depend upon their environment. Students investigate **photosynthesis**, including practical work exploring factors affecting the process, and begin to understand the role of plants as producers and the importance of sunlight as the ultimate energy source for most ecosystems. They study **plant reproduction**, construct and interpret **food webs**, and explore interdependence between organisms. The module introduces **bioaccumulation**, biodiversity and the impact of human activity on ecosystems, including the importance of stable communities and	In **Year 8**, students will expand their knowledge of photosynthesis, also using their introduction to science skills, and design investigations testing factors affecting photosynthesis. They will also link how plant organs are adapted to function and enabling photosynthesis. Year 8 students will also expand on ideas of interdependence, by linking it to biodiversity and the classification of organisms. In **Year 9**, students will re-activate and expand their knowledge of the interactions within food webs, adaptations organisms have to support survival and the importance of maintaining biodiversity. They will also develop their skills by learning how to sample populations and analyse data to assess the impact of abiotic and biotic factors on biodiversity. In **Year 10**, students will draw together knowledge from both	

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		biodiversity for **food security**.	**Life on our Planet** and **Human Body** to be able to explain the processes of inheritance, evolution. They will also develop their knowledge of biodiversity and their evaluation skills by measuring the impact of a range of measures in place designed to maintain biodiversity. Students will also extend their knowledge by evaluating the links between human activity (like deforestation) and the impact this has on biodiversity and the Earth's stable community. In **Year 11**, these topics will be holistically studied to embed knowledge further, building in different contexts and applications to the topics taught previously to prepare for Biology Paper 1 and 2.	
Space	June	**Space** provides an engaging context for developing students' understanding of Earth, the Solar System and the wider Universe while applying scientific and mathematical thinking to unfamiliar problems. Students explore the **structure of the Solar System**, the Big Bang and the evidence supporting it, and the **life cycle of stars**. They investigate the Earth's orbit around the Sun and use this to explain the **seasons**, before applying physics to rocket design through fuel-volume investigations and the principles of **aerodynamics**. This module therefore develops scientific ideas alongside experimental design, data	Space is content that is only retaught if students chose AQA Triple Science at GCSE. Throughout their 5 year journey, they will develop their understanding of fundamental concepts that are key for understanding space, like forces, energy and reactions. In **Year 11**, students will revisit space, where they will recall and extend their knowledge of the origin of the universe, solar systems and the life cycle of a star. This will then be applied independently when interpreting experimental data, evaluating methods and answering unfamiliar practical questions for Physics Paper 2.	

		interpretation and engineering thinking.		
Enrichment (Mission to Mars)	July	**Mission to Mars** provides a synoptic opportunity for students to bring together the scientific knowledge and skills developed throughout Year 7. Students investigate the history of human space exploration and the International Space Station, consider theories about the formation of the Moon and its relationship with **tides**, investigate suitable fuels for rockets and explore how launch success can be optimised. They apply mathematical and scientific reasoning to images from the **Hubble Space Telescope**, consider the evidence for extraterrestrial life, and investigate whether the Martian atmosphere could support human life and whether food could be grown on Mars. Students also apply Physics ideas to **re-entry into Earth's atmosphere**	This interdisciplinary approach helps students understand that science is not a collection of isolated topics, but a connected body of knowledge that can be used to solve complex real-world problems. The value of this module is its deliberately interdisciplinary nature: students draw on **forces, energy, particle theory, chemical reactions, gases, biology, ecosystems and scientific evidence** rather than treating each subject as a separate discipline. The emphasis on problem-solving, evidence, practical investigation, mathematical reasoning and scientific communication also develops the skills students will require throughout **Years 8–11 and beyond**, providing a broad and ambitious foundation for their future Science journey.	