Year 7 Science Curriculum – 2025-2026						
	Autumn Term		**Spring Term**		**Summer Term**	
	1	**2**	**1**	**2**	**1**	**2**
Key Concepts	Skills Cells Particles and Behaviour	Forces Light	Body Systems Atoms, Elements and Compounds	Acids and Alkalis	Reproduction Sound	Reactions Space
Knowledge & Understanding (National Curriculum) *Skills are across the whole year.*	Year 7 begins by ensuring that all students have a firm understanding of the key skills that scientists need. This includes development of an understanding of: • Scientific attitudes • Experimental skills and investigation • Measurement • Analysis and evaluation *The skills unit introduces key disciplinary knowledge, which is utilised and consolidated throughout the science curriculum.* In biology students will know and understand: • Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure, including the use of microscopes. • The functions of cell organelles including cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts • The role of diffusion in the movement of materials in and out of cells • The structural adaptations of some unicellular organisms (euglena) • The structure and functions of the human skeleton • Biomechanics- the interaction between the skeleton and muscles, including the measurement of force exerted by different muscles • The function of muscles, including examples of antagonistic muscles • The structure and functions of the gas exchange system in humans, including adaptations to function • The mechanism of breathing, including simple measurements of lung volume • The impact of exercise, smoking and asthma on the human gas exchange system					

	• reproduction in humans (as an example of mammals), including structure and function of the male and female reproductive systems, the menstrual cycle, gametes, fertilisation, gestation and birth, including the effect of maternal lifestyle on the foetus through the placenta • reproduction in plants, including flower structure, wind and insect pollination, fertilisation seed and fruit formation and dispersal. In chemistry students will know and understand: • The particle model of nature including the properties of different states of matter (solid, liquid, gas) in terms of the particle model, including gas pressure • Changes of state in terms of the particle model • Diffusion in terms of the particle model • Conservation of material and of mass, and reversibility in melting, freezing, evaporation, sublimation, condensing, dissolving • Similarities and differences, including density differences, between solids, liquids and gases • Atoms, elements and compounds including a simple (Dalton) atomic model. • Differences between atoms, elements and compounds • The varying physical and chemical properties of different elements • chemical symbols and formulae for elements and compounds • Conservation of mass changes of state and chemical reactions • The varying physical and chemical properties of the different elements • Chemical reactions as the rearrangement of atoms. • Representing chemical reactions using formulae and equations • combustion, thermal decomposition, oxidation and displacement reactions • defining acids and alkalis in terms of neutralisation reactions • the pH scale for measuring acidity/ alkalinity and indicators In physics students will know and understand: • Forces as pushes or pulls, arising from the interaction between two objects • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces • Effects of forces including deforming objects- stretching and squashing springs; with rubbing and friction between surfaces, with pushing things out the way; resistance to motion of air and water • forces measured in newtons, measurements of stretch or compression as force is changed • force-extension linear relation, Hooke's law as a special case • Non-contact force; gravity acting at a distance on Earth and in space, forces between magnets and forces due to static electricity • Balanced forces • Forces being needed to cause objects to start and stop moving, or to change their speed or direction or motion change depending on direction of force or it's size • How waves can be reflected, and add or cancel – superposition.

	• Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. • The speed of sound in air, in water, in solids, recognising that sound needs a medium to travel. • That sound waves are longitudinal. • The auditory range of humans and animals. • The similarities and differences between light waves and waves in matter. • To use a ray model to explain imaging in mirrors. • That there are different colours and frequencies of light and how these behave going through prisms, in absorption and diffuse reflection. • The difference between mass and weight and how to calculate this on different planets. • The key structures in our solar system such as moons, planets, the sun. • That the sun is our star in our galaxy. • Why do we have days, months, years and seasons?	
Skills	**R** *Develop* **RESILIENCE**	★ *Always striving to improve answers by including key vocabulary and backing up thoughts with scientific explanations.* ★ *Working through challenging situations , reflecting as to why a practical might not produce the expected results and adapting their technique to collect accurate results.*
	A *Possess* **AMBITION**	★ *Seeking to answer scientific questions through analysis of experimental results.* ★ *Devising models and analogies for tricky and abstract scientific concepts.* ★ *Write effectively and coherently using Standard English appropriately.* ★ *Using assessment to make progress – designated improvement and reflection time (Green for Growth) is built in following class assessments, summative assessments and any other teacher marked work.*
	I *Demonstrate* **INTEGRITY**	★ *Completing practical work sensibly baring in mind the safety of themselves and others.*

		★ *Taking responsibility for their studies and individual revision* ★ *Using problem solving skills to work through scientific models.*
	S *Embed* **Self-Discovery**	★ *Sharing their own ideas of scientific questions during class discussions.* ★ *Asking scientific questions, carrying out investigations to find out the answers to scientific questions.* ★ *Students must reflect upon real world advancements and consequences of science such as IVF treatment and space travel implications.*
	E *Display* **EMPATHY**	★ *Respecting the laboratory and others during practical experiments by helping to get equipment for others, compare experimental techniques and keeping the laboratory tidy.* ★ *Showing respect for the class teacher and other students by listening to and contributing to class discussions.* ★ *Respecting other people's opinions and ideas.*

Curriculum Links	**Skills** At KS2, students will have been taught: - Knowledge of risk, hazard and safety precautions. - Conducting scientific experiments **Cells** At KS2, students will have been taught: - The idea of basic light microscopes or magnifying glasses. - The maths skills of multiplication. - Different life processes.	**Forces** At KS2, students will have been taught: - To investigate magnetic forces and learn that they can act at a distance without contact. - Ideas about gravity and investigated the effects of forces on falling objects such as parachutes. - The effects of air resistance, water	**Atoms, Elements and Compounds** At KS2, students will have been taught: - The use of metals, wood, and plastic as everyday materials. **Body Systems** At KS2, students will have been taught: - The structure of the circulatory system and the impact that diet, drugs, exercises, and lifestyle have on the way their bodies function.	**Acids and Alkalis** At KS2, students will have been taught: - Physical changes in terms of changes of state and dissolving. - The idea that some changes result in the formation of new materials, and that this kind of change is not usually reversible, without necessarily identifying this as a chemical change. They should have met two specific examples: burning and the action	**Sound** At KS2, students will have been taught: - To link sound production and transmission to vibrations. - Find patterns between the pitch of sound and the objects used to create the sound as well as the loudness of sound depending on the strength of the vibrations. - A variety of sound sources and explain that sounds are made	**Reactions** At KS2, students will have been taught: - That some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning. **Space** At KS2, students will have been taught: - A model of the solar system. They should know that the sun is a star at the centre of our solar system and that it has 8 planets: (Pluto was reclassified as a 'dwarf planet' in 2006).

	- Basic structure of plants and animals. - Why organisms are classified as plants or animals based on specific characteristics. - The basic idea of diffusion. - Micro-organisms. **Particles and behaviour** At KS2, students will have been taught: - To compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. - To demonstrate that changes of state are reversible changes.	resistance and friction and the act between moving objects. - The use of mechanical devices such as levers and pulleys. **Light** At KS2, students will have been taught: - The idea of transparent and opaque materials. - Shadow formation and reflected light. - How objects are seen. -That light travels in straight lines.	- The idea of organ systems with the basic idea of the circulatory system including the heart and blood. - The idea of life processes and that these require the release of energy.	of acid on bicarbonate of soda. This second example will have introduced the word 'acid'.	by vibrations and link the volume of a sound with the size of the vibrations producing it. They should know that sounds get fainter with distance and link the size of an object with the pitch of the sound it produces. **Reproduction** At KS2, students will have been taught: - The life cycles of mammals and the reproduction processes in animals. - The experiences of puberty as part of the aspects of changes that occur as humans age. - The idea of gestation including that it varies in length for different animals. They will also have covered the basic principles of fertilisation and pregnancy. - The idea of the importance of plants to our ecosystems and the idea of life cycles including the reproduction of some plants.	They should understand that a moon is a natural satellite that orbits a planet and that the Earth has a moon which orbits the Earth on a regular basis. They should also know that the sun, Earth, and moon are approximately spherical and be able to explain day and night as due to the rotation of the Earth on its axis.
Assessment	Checkpoint 1	Checkpoint 2	Checkpoint 3	Checkpoint 4	Checkpoint 5	Checkpoint 6

Aspirations & Careers	All year 7 students are provided with the opportunity to see some interesting and exotic creatures when Zoolab comes into school at the end of the first half term. All year 7 students are invited to complete a chemistry “Christmas card” competition, to design a Christmas card used by the RSC. The 2023 entry was a winner! External visits also include “Big Bang Festival” and “Hydrogen homes” which provides students with the opportunity to look at STEM career opportunities here in the north-east of England and beyond.					