YEAR 7 SCIENCE CURRICULUM PROGRESSION OVERVIEW

Subject Curriculum Intent

The Science curriculum is underpinned by five key elements: factual & conceptual understanding; mathematics; practical & enquiry skills; language & communication; application of knowledge & skills. These elements are used to sequence learning of the fundamental and substantive knowledge specified by the National Curriculum. The curriculum in Key Stage 3 is very knowledge-rich, with a series of shorter units allowing pupils to learn the fundamental knowledge and begin to develop their skills in thinking like a scientist. The curriculum empowers pupils to be able to apply this knowledge, whilst engaging pupils in practical science and discussion, such that they are equipped with the knowledge and skills required to complete further study, be responsible citizens and make informed decisions in their lives.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Topic	Working Scientifically Particles	Cells Forces	Reproduction Atoms, Elements & Compounds	Energy	Mixtures	Interdependence Electric Circuits: Current & Voltage
Core Knowledge/ **Threshold Concept**	Working Scientifically – Safety, equipment, variables, data analysis Particles – Particles are the building blocks of all matter	Cells – Cells are the building blocks of all living things Forces – Contact and non-contact forces	Reproduction – Introduction to first specialised organ system Atoms, Elements & Compounds – Developing an understanding of the nature of matter	Energy – Introduces pupils to the concept of energy	Mixtures – Properties of substances & mixtures	Interdependence – Key ecological terminology & the structure of ecosystems Electric circuits – Series and parallel circuits, voltage and current
Why this learning now?	Particles – A solid grasp of particle behaviour is essential for all subsequent chemistry units	Cells – A fundamental understanding of cells will be applied in all Biology units that follow. Forces – Students learn that although forces are invisible, their effects can be seen – this provides a more concrete starting point	Reproduction – At this time, many students will have begun puberty. Concepts learned are required for subsequent learning about genetics & inheritance Atoms, Elements & Compounds – Learning gives pupils the	Energy – A conceptually accurate understanding of energy is fundamental to pupils learning of all Physics topics	Mixtures – Students can apply their learning about particles. Concepts learned are required for further development of understanding of separation techniques	Interdependence – Learning is fundamental to understanding the role of plants (photosynthesis) Electric circuits – This topic builds on 'Energy transfers' learning and forms a base for further learning on

		for the other big ideas in Physics	language and conceptual understanding to be able to access topics later in the curriculum, e.g. structure & bonding			resistance, more complex calculations (V=IR) & renewable and non-renewable energy
Assessment Opportunities:	Each unit begins with a prior knowledge check to assess key components. Every lesson has: - A recall starter - Embedded AfL tasks for whole class feedback Each end of unit assessment has: - 10 marks based on recall questions & answers (given at the start of the unit) - 15 marks of multiple-choice questions Students will be assessed formally three times a year – these assessments will be longer answer exam questions.					
Learning at Home	Homework will be set and teacher assessed once per topic (minimum). Homework will be recall based and will be a mixture of: - Exam style questions - Quizzes, e.g. Microsoft forms, Seneca					
Key Vocabulary	Variable Matter Condensation	Microscope Specialised Force Speed Friction	Reproduction Menstrual Dispersal Element Compound	Energy Conduction Radiation	Mixture Solution	Population Consumer Series Current Voltage
Spiritual, Moral, Social and Cultural concepts covered	The Science curriculum provides students with the opportunity to learn about and discuss current issues in science, whilst developing their skills of enquiry and research. Students will be supported to be critical consumers of information, and will learn how to consider the relevance of where scientific information comes from, in order to assess its reliability and usefulness. More specifically, concepts covered are: Spiritual - Scale of universe and our significance in it, interdependence of living things Moral - Ethics in Science (our impact on our environment, medical treatments) Social - Impact of science on our lives (renewable energy, ecosystems) respecting opinions, science in the news Cultural - Role of Scientists & their discoveries in our society					
Links to careers and the world of work	Each lesson identifies relevant careers linked to the learning. In addition, we have a spotlight on a particular STEM role or career. This will be explored, using a guided reading approach. In Year 7, the students will learn about: Neurobiology, Earth science, Astrophysics, Bioinformatics, Forensics, Astronomy, Marine science & Performance analysis (in sports)					

YEAR 8 SCIENCE CURRICULUM PROGRESSION OVERVIEW

Subject Curriculum Intent

The Science curriculum is underpinned by five key elements: factual & conceptual understanding; mathematics; practical & enquiry skills; language & communication; application of knowledge & skills. These elements are used to sequence learning of the fundamental and substantive knowledge specified by the National Curriculum. The curriculum in Key Stage 3 is very knowledge-rich, with a series of shorter units allowing pupils to learn the fundamental knowledge and begin to develop their skills in thinking like a scientist. The curriculum empowers pupils to be able to apply this knowledge, whilst engaging pupils in practical science and discussion, such that they are equipped with the knowledge and skills required to complete further study, be responsible citizens and make informed decisions in their lives.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Topic	Particle Theory Tissues & Organs	Light & Sound	Space Nutrition	Acids & Alkalis	Respiration & Photosynthesis	Earth Systems Electric Circuits: Resistance
Core Knowledge/ **Threshold Concept**	Particles – Arrangements of particles can affect properties Tissues & Organs – Movement, breathing & effects of drugs	Light & Sound – Properties of light and sound, how we see and hear, reflection & refraction	Space – Gravity as a non-contact force Nutrition – Digestive system, enzymes, balanced diet	Acids & Alkalis – Common acids & alkalis, neutralisation, reactions of acids	Respiration & Photosynthesis – Aerobic & anaerobic respiration, photosynthesis	Electric Circuits: Resistance – The relationship between current, voltage and resistance, Ohm's law Earth Systems – Structure of the Earth, rock cycle, water cycle
Why this learning now?	Particles – A solid grasp of particle behaviour is essential for all subsequent chemistry units Tissues & Organs – Application of learning about pressure; knowledge of systems covered required for respiration & circulation	Light & Sound – Knowledge from this unit leads to a more complex understanding of how waves transfer energy	Space – Topic introduces three-term equations to practice the mechanics of calculations, a key skill in Physics Nutrition – Learning underpins understanding of how enzymes are affected by different factors	Acids & Alkalis – Application of learning about the particle model; introduction to chemical reactions & word equations	Respiration & Photosynthesis – Application of learning about cells & breathing system; learning forms basis of understanding that all materials cycle in nature	Electric Circuits: Resistance – Application of learning on electric circuits; forms basis for learning about how electricity is generated, transported and used in domestic settings Earth Systems – Application of learning on states of matter

						and changing state; learning crucial for further learning about the carbon and nitrogen cycle, Earth's early atmosphere and life cycle assessments
Assessment Opportunities:	Each unit begins with a prior knowledge check to assess key components. Every lesson has: - A recall starter - Embedded AfL tasks for whole class feedback Each end of unit assessment has: - 10 marks based on recall questions & answers (given at the start of the unit) - 15 marks of multiple-choice questions Students will be assessed formally three times a year – these assessments will be longer answer exam questions.					
Learning at Home	Homework will be set and teacher assessed once per topic (minimum). Homework will be recall based and will be a mixture of: - Exam style questions - Quizzes, e.g. Microsoft forms, Seneca					
Key Vocabulary	Density Pressure Tissue Organ	Reflection Refraction	Weight Solar System Eclipse	Digestion Enzyme Acid Neutralisation	Respiration Photosynthesis	Igneous Sedimentary Metamorphic Parallel Resistance
Spiritual, Moral, Social and Cultural concepts covered	The Science curriculum provides students with the opportunity to learn about and discuss current issues in science, whilst developing their skills of enquiry and research. Students will be supported to be critical consumers of information, and will learn how to consider the relevance of where scientific information comes from, in order to assess its reliability and usefulness. More specifically, concepts covered are: Spiritual – Space (our significance in the universe) Moral - Ethics in Science (our impact on our environment, medical treatments) Social - Impact of science on our lives (healthy diet, selective breeding) respecting opinions, science in the news Cultural - Role of Scientists & their discoveries in our society					
Links to careers and the world of work	Each topic has a spotlight on a particular STEM role or career. This will be explored, using a guided reading approach. In Year 8, the students will learn about: Biotechnology, Planetary science, Data science, Accident & emergency medicine, Anthropology and Astronomy.					

YEAR 9 SCIENCE CURRICULUM PROGRESSION OVERVIEW

Subject Curriculum Intent

The Science curriculum is underpinned by five key elements: factual & conceptual understanding; mathematics; practical & enquiry skills; language & communication; application of knowledge & skills. These elements are used to sequence learning of the fundamental and substantive knowledge specified by the National Curriculum. In Year 9, pupils will build their fundamental knowledge whilst starting to apply previously learnt knowledge to more complex and diverse phenomena of the natural world to build their substantive knowledge.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Topic	Growth & differentiation Light & Sound	The Periodic Table	Changing Substances Variation	Magnetism	Power	Using resources Human interaction
Core Knowledge/ **Threshold Concept**	Growth & differentiation – Cell specialisation, cell transport Light & Sound – Properties of light and sound, how we see and hear, reflection & refraction	The periodic table – Nuclear model of the atom, properties of groups, history of periodic table	Changing Substances – Chemical reactions & chemical equations, conservation of mass Variation – Diversity, adaptations, selective breeding, evolution & extinction	Magnetism – Attraction & repulsion, magnetic fields, electromagnets	Power – Energy and power calculations, generation of electricity	Using resources – Resources from the Earth (metals, water), life cycle assessments Human interaction – Biodiversity, effect of human activities on environment, biomass, food security
Why this learning now?	Growth & differentiation – Application of learning on cells; learning forms basis for subsequent learning on meiosis & cancer Light & Sound – Knowledge from this unit leads to a more complex understanding	The periodic table – Application of learning on fundamentals of matter; learning underpins understanding of chemical bonding and the formation of compounds	Changing Substances – Application of learning on word equations; learning crucial for future learning on quantitative chemistry, electrolysis & reactivity series Variation – Application of learning about reproduction; learning supports	Magnetism – Application of learning on contact and non-contact forces; learning underpins understanding of electromagnetic induction and the motor effect	Power – Application of learning about energy stores and energy transfers; unit provides language and conceptual understanding to be able to access further learning on electric circuits and energy	Using resources – Application of learning on separation techniques and human impact on environment Human interaction – Application of learning on interdependence; learning supports understanding of the Earth's atmosphere &

	of how waves transfer energy		understanding of human impact on biodiversity and prepares students for future learning on natural selection & speciation			importance of sustainability
Assessment Opportunities:	Each unit begins with a prior knowledge check to assess key components. Every lesson has: - A recall starter - Embedded AfL tasks for whole class feedback Each end of unit assessment has: - 10 marks based on recall questions & answers (given at the start of the unit) - 15 marks of multiple-choice questions Students will be assessed formally three times a year – these assessments will be longer answer exam questions.					
Learning at Home	Homework will be set and teacher assessed once per topic (minimum). Homework will be recall based and will be a mixture of: - Exam style questions - Quizzes, e.g. Microsoft forms, Seneca					
Key Vocabulary	Specialisation Surface Area Reflection Refraction	Neutron Mass Number	Chemical Change Reactant Oxidation Variation Species	Magnetic Field Electromagnet	Efficient Power Renewable	Reactivity Sustainable
Spiritual, Moral, Social and Cultural concepts covered	The Science curriculum provides students with the opportunity to learn about and discuss current issues in science, whilst developing their skills of enquiry and research. Students will be supported to be critical consumers of information, and will learn how to consider the relevance of where scientific information comes from, in order to assess its reliability and usefulness. More specifically, concepts covered are: Spiritual - Scale of universe and our significance in it, interdependence of living things, , life diversity (theory of evolution) Moral - Ethics in Science (our impact on our environment, medical treatments, food security, sustainable lifestyle) Social - Impact of science on our lives (renewable energy, ecosystems) respecting opinions, science in the news Cultural - Role of Scientists & their discoveries in our society					
Links to careers and the world of work	Each topic has a spotlight on a particular STEM role or career. This will be explored, using a guided reading approach. In Year 9, the students will learn about: Oceanography, Acoustic science, Fish farming, Research (cancer), Material science, Biopharmaceuticals & Music and acoustics.					