

Science Year 9 Curriculum Overview

		Year 9
Autumn 1	Topic	Physics Strand 1 – Energy
	Content covered, including knowledge and skills.	Energy dissipation, Internal Energy, Renewable and Non-renewable energy sources and the National Grid.
	Links to prior learning.	Year 7 and Year Energy strands. Upper KS2 – Electricity (flow of energy.)
	Links to British Values, SMSC and work-related learning	British Values: Tolerance of Views and opinions of others, Mutual respect. Cultural Capital: Creating a sustainable and environmentally friendly future. Careers link: The National grid and energy supply.
	Literacy: Key words and terminology	Energy, Kinetic, Gravitational, Potential, Transformer, Fusion, Efficiency, Density, Mass, Volume, Conservation, Conduction, Convection, Radiation, Particle theory, Power.
	Topic	Chemistry strand 1 – Substances and properties
	Content covered, including knowledge and skills.	Periodic table: history, structure and use.
	Links to prior learning.	Y7 C2 and C3
	Links to British Values, SMSC and work-related learning	Focus on a scientist: Dmitri Mendeleev
	Literacy: Key words and terminology	Periods; alkali metals; halogens; noble gases

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Autumn 2	Topic	Biology 1 – Living Systems
	Content covered, including knowledge and skills.	The importance of specific organelles such as the ribosome and how they help cells to function. Cell differentiation and organ systems. Disease – non communicable and communicable. Controlling the human body with links to homeostasis
	Links to prior learning.	Year 7 & 8 Living Systems
	Links to British Values, SMSC and work-related learning	SMSC – Disease/health and hygiene WRL - Pathology/immunologist/epidemiologist - Many other medical professions
	Literacy: Key words and terminology	Communicable, non-communicable,homeostasis,regulation,differentiation,mitosis
	Topic	Physics Strand 2 – Waves and Fields
	Content covered, including knowledge and skills.	Wave Basics, Reflection, Refraction, Static electricity, Current and Potential difference, Ohm’s law and electricity in the home.
	Links to prior learning.	Year 7 and 8 Waves and fields strands KS2 Light and Electricity
	Links to British Values, SMSC and work-related learning	Cultural Capital: Creating a sustainable and environmentally friendly future. Careers link: Emergency services, Extreme sports, Aviation, Sound engineering and the National grid.

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	Literacy: Key words and terminology	Incidence, reflection, refraction, electron, charge, Longitudinal, Transverse, Oscillation, Frequency, Wavelength, Ultrasound, Electromagnetic spectrum, GXULIMR, Current, Potential Difference, Resistance.
Spring 1	Topic	Chemistry strand 2 – Particles and structure
	Content covered, including knowledge and skills.	Structure of elements and compounds; polymers; symbol equations; atomic model
	Links to prior learning.	Y8 elements and compounds; Y8 word equations
	Links to British Values, SMSC and work-related learning	Focus on a career; chemical engineer; material scientist.
	Literacy: Key words and terminology	Elements; compounds; polymers
	Topic	Biology Strand 2 - Ecology
	Content covered, including knowledge and skills.	Feeding relationships, respiration, photosynthesis, recycling carbon and water, human impacts/ pollution in food webs and conservation.
	Links to prior learning.	Year 8 Ecology
	Links to British Values, SMSC and work-related learning	Food industry, scientific research, role of ecologists, government organisations' role in conservation and reserves, plastic pollution.
	Literacy: Key words and terminology	Lactic acid, alcohol, fermentation, chemosynthesis, water and carbon cycle, biomass transfer, bioaccumulation, biodiversity, conservation and preservation.
Spring 2	Topic	Physics Strand 3 – Forces and their effects

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Content covered, including knowledge and skills.	Acceleration, Terminal Velocity, Moments, Velocity-time graphs and stopping distance.
Links to prior learning.	Year 7 and 8 Forces and their effects strands Upper KS2 – Forces – This includes ideas about gravity, friction and levers
Links to British Values, SMSC and work-related learning	Cultural Capital: Understanding the safety features in a modern vehicle. British values: The rule of law and enforcing speed restrictions. Careers link: Automotive design and engineering, Aviation and parachutes.
Literacy: Key words and terminology	Mass, Weight, Perpendicular, Constant, Braking, Thinking, Stopping, Newton, Force, Resultant, Distance, Time, Speed, Pressure, Area, Density, Collisions.
Topic	Chemistry strand 3 – Chemical Reactions
Content covered, including knowledge and skills.	Complete and incomplete combustion; Neutralisation; making a salt; patterns in the periodic table.
Links to prior learning.	Y7 C3; Y8 C1,3 and 4; Y9 C1 and C2
Links to British Values, SMSC and work-related learning	Focus on a career: Chemist Toxic pollution from combustion
Literacy: Key words and terminology	Combustion; neutralisation; acid; alkali; salt Chemical reaction; physical reaction; reactants; products; conservation of mass; precipitate

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Summer 1	Topic	Biology Strand 3 –Genetics and Inheritance
	Content covered, including knowledge and skills.	DNA, Chromosomes, Genes, Monohybrid Inheritance; using models
	Links to prior learning.	Year 8 Human reproduction; Year 7 Plant reproduction
	Links to British Values, SMSC and work-related learning	Cultural Capital: NHS, knowledge for farming and crossbreeding plants Careers: Forensic Scientist, Crime Scene Investigator, Mystery writer
	Literacy: Key words and terminology	DNA, Chromosome, Gene, Mendel, Monohybrid Inheritance, Dominant, Recessive, Trait
	Topic	Physics Strand 4 - Astronomy and Radioactivity
	Content covered, including knowledge and skills.	The lifecycle of stars, Evidence of the Big Bang, Types of radioactive decay, Nuclear disasters.
	Links to prior learning.	Year 7 and 8 Astronomy and Radioactivity strands KS2 – Space Physics – The main features of the solar system.
	Links to British Values, SMSC and work-related learning	Cultural Capital: Advancement of understanding of radioactivity. British values: Tolerance – Of beliefs and how the universe was created. SMSC: Chernobyl - Understanding how accidents and warfare can impact lives. Careers link: Medicine, Astronomy and Cancer research.
	Literacy: Key words and terminology	Proto star, Nebula, Main sequence, Alpha, Beta, Gamma, Penetration, Cancer, Stars, Planets, Galaxies, Satellites, Axis, Tilt, telescopes, The Big Bang, CMBR, Red shift.

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Summer 2	Topic	Chemistry strand 4 – Earth Chemistry
	Content covered, including knowledge and skills.	Rock changes, making fossil fuels, carbon cycle.
	Links to prior learning.	KS2 (year 3 programme of study: rocks), Y7 & Y8 C4, Y8 C3.
	Links to British Values, SMSC and work-related learning	Links to Geography. Focus on a career: Geologists and chemical engineer. Cultural capital: The impacts of using fossil fuels and why it's important to seek out alternatives and to live as sustainably as we can as individuals.
	Literacy: Key words and terminology	Rock types (igneous, metamorphic, sedimentary), rock cycle, weathering, erosion, non-renewable resource, finite, fossil fuels, renewable resource, carbon cycle.
	Topic	Biology Strand 4 - Evolution and Biodiversity
	Content covered, including knowledge and skills.	Species, Mutation, Selective Breeding, Biodiversity & Gene banks
	Links to prior learning.	Year 8 Variation and species survival; Year 7 Classification
	Links to British Values, SMSC and work-related learning	Cultural Capital: Role of Kew Garden; Jane Goodall, Communication of Science ideas and concepts British Values: Tolerance of differences Careers: gardener, horticulturalist, dog breeder, livestock management

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	Literacy: Key words and terminology	Species, mutation, selective breeding, genotype, phenotype, adaptation, biodiversity, extinction.