Science Subject Intent

The science department empowered students by strengthening their ability to think critically, evaluate evidence and fostered their curiosity of the natural world. Students will

- Know fundamental scientific principles from biology, chemistry and physics that will provide a foundation for understanding and navigating the world.
- Understand the processes of scientific inquiry that lead to the creation and development of concepts and theories.
- Appreciate how science can be used to explain observations and make predictions about natural phenomena.

Five Year Plan

Year 7			
	Cycle 1	**Cycle 2**	**Cycle 3**
Content	Science skills, Cells and life processes, Forces, and space, Particles and solutions	Reproduction. Atoms and elements, Energy	Ecology, Acids and alkalis, Earth materials and the atmosphere
Skills	Using laboratory equipment safely/hazard management Recording and analysing data	Evaluating models Recalling and using technical vocabulary accurately and appropriately	Using laboratory equipment safely/hazard management Evaluating models
Progression	Using practical scientific methods and processes when carrying out scientific enquiries. Organ systems in plants and animals The force of gravity and the effect of resistive forces like air resistance and friction Solids, liquids and gases. Knowledge of some separation techniques	The life process of reproduction in some plants and animals Students have learned about materials and how they can be grouped and compared but have not been taught about atoms and elements Energy has not been explicitly taught yet	Animals and plants are adapted to suit their environments Acids can react with bicarbonate of soda **Enter info from KS2 learning for Earth materials and the atmosphere**
Link to GCSE	B1 cells, C1 atomic structure, P5 forces	B5 homeostasis, P1 energy, C1 atomic structure	B7 ecology, C4 chemical changes, P6 waves
Year 8			
	Cycle 1	**Cycle 2**	**Cycle 3**
Content	The body, Metal reactions, Forces and motion	Plants and photosynthesis, Waves Chemical reactions, Electricity, and magnetism	Variation and inheritance, Pressure, density and moments, Earth materials and the atmosphere
Skills	Using and rearranging equations using the algebraic method Recalling and using technical vocabulary accurately and appropriately	Evaluating models Using laboratory equipment safely/hazard management	Using and rearranging equations using the algebraic method Evaluating models
Progression	*From KS2-* Properties of materials Forces *From y7-* Cells and life processes	*From KS2-* Plants Electricity Forces and magnets	*From KS2-* *Evolution and inheritance* *rocks* *From y7-* Reproduction

	Atoms and elements Forces and space	Light travels in straight line from sources to objects then our eyes. Sounds are made by vibrations *From y7-* Cells and life processes Atoms and elements Particles and solutions	Atoms and elements/Particles and solutions Energy *From cycles 1 & 2* Plants and photosynthesis Forces and motion
Link to GCSE	B2 organisation, C4 chemical changes, P5 forces	B4 bioenergetics, C2 bonding, structure, and properties of matter/C3 quantitative chemistry P1 energy/P2 electricityP7 magnetism and electromagnetism	B6 inheritance and variation C9 the evolution of the atmosphere P3 particle model of matter /P5 forces
Year 9			
	Cycle 1	**Cycle 2**	**Cycle 3**
Content	Atomic structure and the periodic table, Cells	Particle model of matter, Bonding, Organisation	Atomic structure, Infection and response,
Skills	Evaluating models Using laboratory equipment safely/hazard management	Evaluating models Recalling and using technical vocabulary accurately and appropriately	Evaluating models Recalling and using technical vocabulary accurately and appropriately
Progression	From KS3 Particles and solutions, atoms and elements, cells and life processes	From KS3 Particles and solutions, atoms and elements, chemical reactions, the body, plants and photosynthesis	From KS3 Particles and solutions, pressure density and moments, cells and life processes, plants and photosynthesis
Link to GCSE / A-Level	C2 bonding, P3 particle model, P4 atomic structure, B2 organisation ***A level*** ***Explores these topics in more detail***	C1 atomic structure and the periodic table, P4 atomic structure, B1 cells ***A level*** Cells, atomic structure, organisation	C1 atomic structure and the periodic table, P3 particle model of matter, B1 cells ***A level*** Particle physics, nuclear physics, photosynthesis and respiration
Year 10			
	Cycle 1	**Cycle 2**	**Cycle 3**
Content	Bioenergetics, Energy changes, Energy	Infection and response, Electricity, Chemical changes, Quantitative	Homeostasis, Forces and Chemistry of the atmosphere
Skills	Using and rearranging equations using the algebraic method Recalling and using technical vocabulary accurately and appropriately	Recording and analysing data Using laboratory equipment safely/ Hazard management	Using and rearranging equations using the algebraic method Recalling and using technical vocabulary accurately and appropriately
Progression	*From KS3* Energy (y7), chemical reactions (y8) *From y9* B1 cells C2 bonding, structure, and properties of matter	*From KS3* Energy (y7), Electricity and magnetism (y8) chemical reactions (Y8) reproduction (y7) *From y9* B1 cells	*From KS3* Earth materials and atmosphere (Y8) Forces (Y7) forces and motion (Y8) *From y9*

		C2 bonding, structure, and properties of matter *From cycle 1* P1 energy	C1 Atomic structure and the periodic table/C2 bonding, structure, and properties of matter
Link to GCSE / A-Level	B4 homeostasis B6 inheritance and variation ***A level biology*** 3.2.4. cell recognition and the immune system ***A level chemistry*** 3.1.12 Acids and bases/ 3.2.6 Reactions of ions in aqueous solution/ 3.2.5 Transition metals ***A level Physics*** Particle physics – rest energies $E=mc^2$ Conservation of energy Energy level diagrams	B6 inheritance and variation C9 chemistry of the atmosphere P7 magnetism and electromagnetism ***A level biology*** 3.2.3 transport across cell membranes 3.6 organisms respond to changes in their internal and external environment ***A level chemistry*** 3.1.12 Acids and bases/ 3.2.6 Reactions of ions in aqueous solution/ 3.2.5 Transition metals ***A level Physics*** Electromagnetic induction Photoelectric effect	C7 organic chemistry/C10 using resources ***A level chemistry*** 3.3 organic chemistry ***A level Physics*** Calculating resultant forces, resolving forces into components Particle interactions, strong and weak nuclear forces, gravitational force, electrostatic force Mechanics and statics
Year 11			
	Cycle 1	**Cycle 2**	**Cycle 3**
Content	Ecology, Organic, Rates, Waves**, C**hemical analysis	Using resources, Inheritance, Magnetism	Revision/exam prep
Skills	Using and rearranging equations using the algebraic method Recording and analysing data	Evaluating models Recalling and using technical vocabulary accurately and appropriately	Using and rearranging equations using the algebraic method Recalling and using technical vocabulary accurately and appropriately
Progression	Variation and inheritance, waves (yr7) Chemical reactions (yr8)	Ecology (yr7) Electricity and magnetism (yr8)	All KS3 and KS4
Link to GCSE / A-Level	***A level biology*** ***A level chemistry*** Energetics, organic and further organic ***A level Physics*** Electromagnetic waves, Maxwell's formula for the speed of light Wave particle duality Stationary waves and superposition	***A level biology*** ***A level chemistry*** ***A level Physics*** Magnetic fields, flux density Electromagnetic induction Magnetic flux and flux linkage	