

YEAR 10 COMBINED SCIENCE CURRICULUM PROGRESSION OVERVIEW

Science is changing our lives and is vital to the world's future prosperity, and all students should be taught essential aspects of the knowledge, methods, processes and uses of science. They should be helped to appreciate the achievements of science in showing how the complex and diverse phenomena of the natural world can be described in terms of a number of key ideas relating to the sciences which are inter-linked, and which are of universal application.

| | Autumn Term 1 | Autumn Term 2 | Spring Term 1 | Spring Term 2 | Summer Term 1 | Summer Term 2 |
|--|--|--|--|---|--|--|
| Topic | 4.1 Cell Biology 5.1 Atomic Structure & the Periodic Table 6.1 Energy | 4.2 Organisation 5.2 Bonding, Structure, & the Properties of Matter 6.3 Particle Model of Matter | 4.3 Infection & Response 5.3 Quantitative Chemistry 6.2 Electricity | 4.4 Bioenergetics 5.4 Chemical Changes 6.2 Electricity | 4.7 Ecology 5.3 Quantitative Chemistry 6.4 Atomic Structure | 4.7 Ecology 5.5 Energy Changes 6.6 Waves |
| Core Knowledge/ Threshold Concept | 4.1.1 Cell structure 4.1.2 Cell division 4.1.3 Transport in cells 5.1.1 A simple model of the atom, symbols, relative atomic mass, electronic charge & isotopes 5.1.2 The Periodic Table 6.1.1 Energy changes in a system & the ways energy is stored before & after such changes 6.1.2 Conservation & dissipation of energy 6.1.3 National & global energy resources | 4.2.1 Principles of organisation 4.2.2 Animal tissues, organs & organ systems 4.2.3 Plant tissues, organs & systems 5.2.1 Chemical bonds, ionic, covalent & metallic 5.2.2 How bonding & structure are related to the properties of substances 6.3.1 Changes of state & the particle model 6.3.2 Internal energy & energy transfers 6.3.3 Particle model & pressure | 4.3.1 Communicable diseases 5.3.1 Chemical measurements, conservation of mass & the quantitative interpretation of chemical equations 6.2.1 Current, potential difference & resistance 6.2.2 Series & parallel circuits | 4.4.1 Photosynthesis 4.4.2 Respiration 5.4.1 Reactivity of metals 5.4.2 Reactions of acids with metals 5.4.3 Electrolysis 6.2.3 Domestic uses and safety 6.2.4 Energy transfers | 4.7.1 Adaptations, interdependence & competition 4.7.2 Organisation of an ecosystem 5.3.2 Use of amount of substance in relation to masses of pure substances 6.4.1 Atoms and isotopes 6.4.2 Atoms & nuclear radiation | 4.7.3 Biodiversity & the effect of human interaction on ecosystems 5.5.1 Exothermic & endothermic reactions 6.6.1 Waves in air, fluids & solids 6.6.2 Electromagnetic waves |
| Why this learning now? | Topics are fundamental to understanding Science | Crucial knowledge builds on fundamental concepts, i.e. apply | Crucial knowledge builds to cover more conceptually difficult | Topics build in difficulty. In Chemistry, pupils will apply their | Topics build in difficulty and continue to apply crucial | In Biology and Physics, Paper 2 content is started. Ecology is |

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| | and follow from prior learning | knowledge of atoms to bonding and extend their knowledge of cells to tissues and organs. | aspects such as electricity in Physics. | learning to new contexts. The quantitative section has been split to allow mastery through application. | knowledge. Pupils recap their learning from Chemistry Term 1 by looking at the atom in Physics. | covered in Summer to enrich the curriculum through outdoor learning and practical work. |
| Assessment Opportunities: | <ul style="list-style-type: none"> ➤ Recall starter activities (crucial knowledge) ➤ AFL in lessons ➤ End of topic tests & exam questions (develop exam skills) | | | | | |
| | ➤ Standardised block test (Oct) with synoptic content. | ➤ Re-test for underperforming students (Nov) | ➤ Standardised block test (Jan) with synoptic content. | Re-test (Feb/Mar) | ➤ Standardised block test (Apr) with synoptic content. | ➤ Full Mock Paper 1 Exam (Jun) |
| Learning at Home | <ul style="list-style-type: none"> ➤ Exam questions ➤ Online learning (SENECA, MyGCSEScience, YouTube, etc.) ➤ Recall activities (quizzes, revision tasks, etc.) | | | | | |
| Key Vocabulary | Concentration gradient, Eukaryotic Atomic number, Mass number, Periodic table, Reactivity Energy, Insulation, Power, Renewable | Capillary, Chamber Covalent bond, Fullerene, Ionic bond, Lattice Density, Specific Heat Capacity | Pathogen, White blood cells Conservation, mass & Acid, Electrolysis Current, Potential difference, Resistance, Series | Photosynthesis, Respiration Acid, Electrolysis Atom, Isotope, Radioactive decay | Abiotic, Biodiversity Conservation, mass Atom, Isotope, Radioactive decay | Abiotic, Biodiversity Endothermic, Exothermic Amplitude, Frequency, Refracted, Transverse |
| Spiritual, Moral, Social and Cultural concepts covered | <p>The aims of the National Curriculum in Science are to develop scientific knowledge and conceptual understanding, follow the scientific process to answer questions about the world to equip pupils with the knowledge required to understand the uses and implications of science. There SMSC is covered in a variety of contexts throughout the teaching order.</p> <p>Spiritual: Cloning, Evolution, Genetic testing, GM foods, Pollution, Stem cells, the development of the Periodic Table.</p> <p>Moral: Animal rights, Cloning, Deforestation, Drug abuse, Genetic testing, Obesity, Fertilisers, Pollution, Fossil fuels, Nuclear fuels</p> <p>Social: Water purification, Life cycle assessments, Electromagnetic waves for communication, Fossil fuels, Nuclear power</p> <p>Cultural: Contributions of scientists, Biodiversity, Ecosystems, Genetic variation, Big Bang theory, Star formation</p> | | | | | |
| Links to careers and the world of work | <p>Staff will regularly link the learning in lessons to real-life contexts in order to engage and enthuse the pupils. For example, in Biology the pupils will look at the circulatory system which links to medical careers and in Ecology will perform experiments like a biologist. In Chemistry, they will look at the industrial applications of electrolysis and the work of famous scientists in developing the atomic model. Finally, in Physics the students will discuss how components are used in household items and how plugs and the National Grid function.</p> | | | | | |

YEAR 11 COMBINED SCIENCE CURRICULUM PROGRESSION OVERVIEW

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| | Autumn Term 1 | Autumn Term 2 | Spring Term 1 | Spring Term 2 | Summer Term 1 | Summer Term 2 |
|--|---|--|--|---|--|--------------------------------|
| Topic | 4.7 Biodiversity 5.6 The Rate & Extent of Chemical Change 6.5 Forces | 4.5 Homeostasis & Response 5.7 Organic Chemistry 5.9 Chemistry of the Atmosphere 6.5 Forces | 4.6 Inheritance, Variation & Evolution 5.8 Chemical Analysis 6.5 Forces | 4.6 Inheritance, Variation & Evolution 5.6 The Rate & Extent of Chemical Change 5.10 Using Resources 6.7 Magnetism & Electromagnetism | Synoptic Content & Exam Skills | Synoptic Content & Exam Skills |
| Core Knowledge/ Threshold Concept | 4.7.3 Biodiversity & the effect of human interaction on ecosystems 5.6.1 Rate of reaction 6.5.4 Forces & motion | 4.5.1 Homeostasis 4.5.2 The human nervous system 4.5.3 Hormonal coordination in humans 5.7.1 Carbon compounds as fuels and feedstock 5.9.1 The composition & evolution of the Earth's atmosphere 5.9.2 Carbon dioxide & methane as greenhouse gases 5.9.3 Common atmospheric pollutants & their sources 6.5.1 Forces & their interactions | 4.6.1 Reproduction 4.6.2 Variation & evolution 5.8.1 Purity, formulations & chromatography 5.8.2 Identification of common gases 6.5.2 Work done & energy transfer 6.5.3 Forces & elasticity 6.5.5 Momentum | 4.6.3 The development of understanding of genetics & evolution 5.6.2 Reversible reactions & dynamic equilibrium 5.10.1 Using the Earth's resources & obtaining potable water 5.10.2 Life cycle assessment & recycling 6.7.1 Permanent & induced magnetism, magnetic forces & fields 6.7.2 The motor effect | Synoptic Content & Exam Skills | Synoptic Content & Exam Skills |
| Why this learning now? | Topics build on prior learning from Year 10 | Crucial knowledge builds on fundamental | Crucial knowledge builds to cover more | Topics build in difficulty. In Chemistry, | In this final term, the lessons are spent on | |

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| | and are consolidated to allow progression onto more challenging knowledge and application | concepts. In Physics, fundamental concepts in forces are introduced which will be applied later in the year. | conceptually difficult aspects such as evolution in Biology. | pupils will apply their learning to new contexts such as equilibria. | review of key concepts and revision techniques ready for the GCSE exam. | |
| Assessment Opportunities: | <ul style="list-style-type: none"> ➤ Recall starter activities (crucial knowledge) ➤ AFL in lessons ➤ End of topic tests & exam questions (develop exam skills) | | | | | |
| | ➤ Full Mock Exam (Paper 1) | ➤ Re-test for underperforming students (Nov) | ➤ Mock Exam (Paper 1 & 2) | ➤ Mock Exam (Paper 2) | ➤ GCSE Exam | ➤ GCSE Exam |
| Learning at Home | Staff use a variety of resources including: <ul style="list-style-type: none"> ➤ Exam questions ➤ Online learning (SENECA, MyGCSEScience, YouTube, etc.) ➤ Recall activities (quizzes, revision tasks, etc.) | | | | | |
| Key Vocabulary | Abiotic, Biodiversity Collision Theory, Rate Acceleration, Displacement, Velocity | Homeostasis, Hormone, Impulse Atmosphere, Crude Oil, Fractional Distillation, Global Climate Change Inertia, Vector Quantity | Chromosome, Variation Chromatography, Pure Extension, Stopping Distance | Chromosome, Variation LCA, Separate Electromagnet, Magnetic Field | n/a | n/a |
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| Links to careers and the world of work | Staff will regularly link the learning in lessons to real-life contexts in order to engage and enthuse the pupils. For example, in Biology the pupils will look at the circulatory system which links to medical careers and in Ecology will perform experiments like a biologist. In Chemistry, they will look at the industrial applications of electrolysis and the work of famous scientists in developing the atomic model. Finally, in Physics the students will discuss how components are used in household items and how plugs and the National Grid function. | | | | | |