

Springwood High School Science Curriculum Plan

Our Vision:

To ensure that we provide an excellent quality of Science provision for all students in the local area, enabling them to access higher level Science based careers.

Exam boards: GCSE AQA trilogy and separate sciences, Year 12/13 OCR Chemistry A and Physics A, Year 12/13 AQA Biology, Applied Science BTEC

Brief overview of topics, themes, skills or key questions for each term:

Key Stage 3

Why are we teaching a knowledge-rich curriculum; how is it different?

Our knowledge-rich curriculum uses a model we call the Core Question Methodology. This is based on work of leading science advisors from across the country. It outlines the core knowledge that students are expected to know for each topic. Our curriculum implementation is seen as an ongoing process with it evolving over time, and is reviewed yearly by KS3 Trust Leads with improvements being made when necessary.

Why are we teaching this content, in this order?

Topics are carefully sequenced to ensure students establish understanding and knowledge, and can further develop this into KS4 and beyond. Units are carefully prepared to balance core knowledge with relevant examples and to be introduced in a systematic way. The knowledge is extended with information concerning the history of science. Our science curriculum plan will give an overview of content taught for all year groups.

How does our curriculum match the ambition of the National Curriculum?

The National Curriculum was used to aid the creation of our KS3 curriculum so our vision matched the ambition and intent of the National Curriculum. Our curriculum also maps practical skills needed to understand key scientific principles, ensuring all students have sufficient opportunities to become competent in these.

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How does the curriculum build on that from Key Stage 2?

Our curriculum is based on 'Big Ideas' in biology, chemistry and physics, across each Key Stage, and therefore builds on the knowledge obtained from KS2. Our curriculum links new content to knowledge that they are already secure with, using spaced practice and interleaving to achieve this.

By the end of Key Stage 3, what key knowledge should pupils need to remember and be able to apply in this subject?

By the end of Key stage 3, students should have a secure understanding of the 'Big Ideas', as well as being proficient in the skills associated with practical activities.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7 – Throughout practical skills, numeracy skills and application will be developed	Cells Matter Spaced practice	Cells Matter Chemical reactions Electricity	Chemical reactions Electricity Spaced practice	Forces Ecology Spaced practice	Forces Ecology Spaced practice	Forces Ecology Spaced practice
8 - Throughout practical skills, numeracy skills and application will be developed	Energy Solutions	Energy Solutions Spaced practice Organ systems Electricity	Organ systems Electricity Spaced practice	Principles of chemistry Disease and evolution Spaced practice	Principles of chemistry Disease and Evolution Spaced practice	Spaced practice Crest project

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9 Throughout practical skills, numeracy skills and application will be developed	<p>Biology – Cells</p> <p>Chemistry – Atoms and the periodic table</p> <p>Physics – States of matter and density</p> <p>Astronomy – Planet Earth, celestial observation</p>	<p>Biology – Cells, health, spaced practice</p> <p>Chemistry – Atoms and the periodic table, bonding, spaced practice</p> <p>Physics – States of matter and density, energy, spaced practice</p> <p>Astronomy – Celestial observation, the lunar disc</p>	<p>Biology – Health</p> <p>Chemistry – Bonding</p> <p>Physics – Energy</p> <p>Astronomy – The lunar disc, exploring the moon, exploring the Solar System</p>	<p>Biology – Health, ecology</p> <p>Chemistry – Bonding, Earth, spaced practice</p> <p>Physics – Energy, electricity, spaced practice</p> <p>Astronomy – Exploring the Solar System, Solar System observations</p>	<p>Biology – Ecology, spaced practice</p> <p>Chemistry – Earth, spaced practice</p> <p>Physics – Electricity, spaced practice</p> <p>Astronomy – Early models of the Solar System, planetary motion and gravity</p>	<p>Biology – Ecology</p> <p>Chemistry – Earth, spaced practice</p> <p>Physics - Electricity</p> <p>Astronomy – Solar astronomy, The Earth-moon-sun system</p>

Key Stage 4

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10 Throughout practical skills, numeracy skills and application will be developed	<p>Biology – Cell biology, organisation</p> <p>Chemistry – States of matter and separation techniques, chemical reactions</p>	<p>Biology – Organisation</p> <p>Chemistry – Chemical reactions</p> <p>Physics – Electricity</p>	<p>Biology – Organisation</p> <p>Chemistry – Bonding</p> <p>Physics – Electricity, spaced practice</p>	<p>Biology – Infection and response</p> <p>Chemistry – Quantitative chemistry</p> <p>Physics – Particle model of</p>	<p>Biology – Infection and response, bioenergetics</p> <p>Chemistry – Quantitative chemistry, energy changes</p>	<p>Biology – Bioenergetics, ecology and food production</p> <p>Chemistry – Rates of reaction</p> <p>Physics– Forces</p>

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	<p>Physics – Energy, spaced practice</p> <p>Astronomy – Time and the Earth-moon-sun cycles, formation of planetary systems</p>	<p>Astronomy – Formation of planetary systems, exploring starlight</p>	<p>Astronomy – Exploring starlight, stellar evolution</p>	<p>matter, atomic structure</p> <p>Astronomy – Stellar evolution, our place in the galaxy</p>	<p>Physics – Atomic structure, forces</p> <p>Astronomy - Cosmology</p>	<p>Astronomy</p>
<p>11 Recap of content and exam preparation all year, key skills, practical's and math's</p>	<p>Biology – Inheritance</p> <p>Chemistry – analysis</p> <p>Physics – Electromagnetic waves Paper 1 recap of content exam preparation</p>	<p>Biology – Ecology and food production</p> <p>Chemistry – Earth</p> <p>Physics – Electromagnetism Paper 1 recap of content exam preparation</p>	<p>Biology – Ecology and food production</p> <p>Chemistry – spaced practice</p> <p>Physics - Electromagnetism Paper 2 recap of content exam preparation</p>	<p>Triple: Revision pack A Combined: Revision pack A</p>	<p>Triple: Revision pack B Combined: revision pack B</p>	

Key Stage 5

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
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12	<p>Biology – biological molecules and cell structures</p> <p>Chemistry – FOUNDATION chemistry, Atoms and reactions (I), electrons bonding and structure (I), basic organic chemistry and hydrocarbons (I).</p> <p>Physics – Electricity, foundations of physics, work energy and power Applied Science – working with waves, cells structure and function, structure and bonding unit 2 practical's</p>	<p>Biology – biological molecules, cell structures</p> <p>Chemistry – Atoms and reactions (II), electrons bonding and structure (II), basic organic chemistry and hydrocarbons (II).</p> <p>Physics – Electricity, motion, materials Applied Science - working with waves, cells structure and function, structure and bonding unit 2 practical's</p>	<p>Biology – Gas exchange, protein synthesis, transport across membranes, immunity</p> <p>Chemistry – Atoms and reactions (III), electrons bonding and structure (III), basic organic chemistry and hydrocarbons (III).</p> <p>Physics – Electricity, motion, materials Applied Science – waves in communication, Cell specialisation, production and uses of substances, unit 2 practical's</p>	<p>Biology – Gas exchange, immunity, transport across membranes, exchange and transport, diversity and selection</p> <p>Chemistry – Physical chemistry (I), periodic table (I), alcohols & haloalkanes (I)</p> <p>Physics – Waves, Forces, Newton's laws of motion Applied Science - waves in communication, Cell specialisation, production and uses of substances, unit 2 practical's</p>	<p>Biology – exchange and transport, diversity and selection, classification and selection, exam preparation</p> <p>Chemistry – Physical chemistry (I), periodic table (II), haloalkanes (II) and analysis</p> <p>Physics – Waves, Thermal physics Applied Science – Uses of electromagnetic waves in communication, Tissue structure and function, production and uses of substances, unit 2 practical's</p>	<p>Biology – Classification and selection, homeostasis, energy transfers, populations and ecosystems</p> <p>Chemistry (Yr13) – Rates and aromatic compounds</p> <p>Physics – Quantum, thermal physics Applied Science – Exam preparation, unit 2 practical's</p>
13	<p>Biology – Homeostasis, stimuli and response, respiration, genome projects, nervous coordination, photosynthesis</p>	<p>Biology – Genome projects, nervous coordination, photosynthesis, mutations and gene expression</p> <p>Chemistry – Equilibrium & pH</p>	<p>Biology – Mutations and gene expression, genetics, skills</p> <p>Chemistry – Energy (I), organic synthesis and polymers</p>	<p>Biology – Exam preparation</p> <p>Chemistry – Energy (II), transition metals and organic analysis</p>	<p>Biology – Exam preparation</p> <p>Chemistry – Exam preparation</p> <p>Physics – Exam preparation</p>	

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	<p>Chemistry – Equilibrium & pH (I), carbonyls & carboxylic acids</p> <p>Physics – Circular motion, oscillations, capacitors</p> <p>Applied Science – optional unit and unit 3 practical's</p>	<p>(II), organic nitrogen compounds</p> <p>Physics – Electric fields, electromagnetism, gravitational fields</p> <p>Applied Science - optional unit and unit 3 practical's</p>	<p>Physics – Astro physics and cosmology, nuclear particle physics</p> <p>Applied Science - optional unit and unit 3 practical's</p>	<p>Physics – Astro physics and cosmology, medical imaging</p> <p>Applied Science - optional unit and unit 3 practical's</p>	<p>Applied Science – Exam preparation</p>	
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Enrichment Activities:

Super Learning Days: Year 8 space centre, year 12 Nuclear power station

Competitions: CREST Award end of year 8

Trips: Norwich Cathedral – A natural history adventure

Clubs & Support: After school and lunchtime revision, Year 7 and 8 Discovery Award, Year 9 Silver Crest Award, Uplearn, External Lecture program for Year 12/13.