

Year 9 Science

Students build on their knowledge from Year 7 and 8 by starting GCSE topics in Year 9. We start with the basic principles of cells, atomic structure and energy. All of these concepts have been developed in Years 7 and 8 so the Year 9 topics build complexity on the knowledge the students already have, and extend understanding further. As Year 9 progresses, we introduce further topics that build on the first ones. These are organisation (of organisms), bonding (in reactions) and forces. We finish the year by studying the atmosphere and the electromagnetic spectrum. As before, these topics build on work in Years 7 and 8, as well as using ideas from lessons met earlier in Year 9.

There are three assessments in Year 9. These are spaced out to be one per term. Each assessment covers the work met in the year up to that point. As such the assessments build in complexity through the year to reflect the depth of knowledge that develops. We use low stakes testing in most lessons through the entire year to check understanding and develop good test technique.

Students are set in mixed ability groups with all groups following the same curriculum. There are 7 lessons a fortnight and this is split between 2 teachers.

Methods of deepening and securing knowledge:

Retrieval practice	Almost all lessons have retrieval practice in them. This is usually as a starter activity. Additionally at the end of most lessons a past paper question is used to assess understanding from the lesson and also recall of previous learning.
Interleaving	Retrieval practice includes interleaved questions from previous topics, making connections between topics where possible. Additionally revision periods are spaced through the year to revisit previous topics.

	Autumn term 1	Autumn term 2	Spring term 1	Spring term 2	Summer term 1	Summer term 2
Topic(s)	B1 Cell biology <ul style="list-style-type: none"> - Microscopy - Eukaryotes and prokaryotes - Animal and plant cells - Cell specialisation - Cell differentiation - Culturing microorganisms - Chromosomes - Mitosis and the cell cycle - Stem cells - Diffusion - Osmosis - Active transport 		B2 Organisation <ul style="list-style-type: none"> - The human digestive system - Catalysts and enzymes - The heart and blood vessels - Blood - Coronary heart disease - Cancer - Plant tissues - Plant organ systems C2 Bonding, structure and the properties of matter <ul style="list-style-type: none"> - Chemical bonds - Ionic bonding 		C9 Chemistry of the atmosphere <ul style="list-style-type: none"> - Earth's atmosphere - Greenhouse gases - Global climate change - Carbon footprint - Air pollutants P6 Waves <ul style="list-style-type: none"> - What is a wave? - Properties of Waves - EM Spectrum - Radio, Micro, IR & Visible - Absorption and Emission of radiation - UV, X-Rays, Gamma 	

	<p>C1 Atomic structure and the periodic table</p> <ul style="list-style-type: none"> - Atoms elements and compounds - Mixtures - Development of the model of the atom - Relative electrical charges of subatomic particles - Size and mass of atoms - Relative atomic mass - Electronic structure <p>The Periodic Table</p> <ul style="list-style-type: none"> - Development of the periodic table - Metal and non-metals - Group 0 - Group 1 - Group 7 - Comparison of transition elements with Group 1 elements <p>P1 Energy</p> <ul style="list-style-type: none"> - Energy Stores - Conservation of Energy - Efficiency - Factors affecting thermal conductivity - Insulating buildings - Non-renewable power stations - Water, wind and solar power - Geothermal and Biofuels - Evaluation of energy sources 	<ul style="list-style-type: none"> - Ionic compounds - Covalent bonding - Metallic bonding - The three states of matter - State symbols - Properties of ionic compounds - Properties of small molecules - Polymers - Giant covalent structures - Properties of metals and alloys - Metals as conductors - Diamond - Graphite - Graphene and fullerenes - Sizes of particles and their properties (nanoparticles) - Uses of nanoparticles <p>P5 Forces</p> <ul style="list-style-type: none"> - Contact and Non-Contact Forces - Resultant Forces - Weight and Gravitational Fields - Centre of Mass - Calculating Work Done - Forces and Elasticity - Speed and Velocity - Distance Time Graphs - Acceleration - Velocity Time Graphs - Terminal Velocity 	<ul style="list-style-type: none"> - X-Rays in Medicine 			
Assessment	Aiming High 1 test covering B1 and C1 topics		Mid-year assessment covering B1, C1, P1.		Aiming High 2 test covering B1, C1, p1, B2, C2, P5.	

Independent Learning:

Independent learning is set every week in line with the school policy. We set online work on Educake which reviews previous learning in a quiz-like format. Additionally we utilise 'knowledge organiser' booklets to set students tasks to produce revision material from allocated pages. We also set 'language for learning' tasks every half term which requires students to read and understand a relevant text and follow that up by answering questions. Our independent learning tasks embed learning in the class, develop independent study skills and boost literacy through reading.