

Applied Science Level 3 AAQ KEY STAGE 5 CURRICULUM OVERVIEW

By the end of Key Stage 5, students should:

Know	<p>Students should know core scientific knowledge in the following areas: Biology: cell structure, genetics, physiology, ecosystems Chemistry: atomic structure, bonding, reactions, analytical techniques Physics: waves, electricity, energy, forces, matter</p>	Students should also know how to handle and analyse data correctly by applying statistical and mathematical tools to their own work.
Do	<ul style="list-style-type: none"> Explain and apply biological, chemical, and physical principles to real-world contexts. Solve problems, predict outcomes, and link concepts across sciences. Design investigations, form hypotheses, and ensure fair testing. Use lab equipment safely, collect accurate data, and manage errors. Organize results in tables/graphs, perform calculations, and identify trends. Draw evidence-based conclusions and suggest improvements. 	<ul style="list-style-type: none"> Present findings clearly using correct terminology. Write structured reports and use numerical/graphical methods effectively. Follow health and safety procedures, manage risks, and show ethical awareness. Apply principles to technologies and careers, understand research impact, and value evidence-based decisions. Work independently and collaboratively, manage time/resources, and show problem-solving and critical thinking.
Appreciate	<ul style="list-style-type: none"> The value of Science in everyday life and how it underpins health, technology, and solutions to global challenges like climate change. That scientific literacy enables informed decisions and meaningful contributions to society. 	<ul style="list-style-type: none"> That science is a dynamic process based on evidence, critical thinking, and learning from mistakes and that progress depends on teamwork, communication, and ethical responsibility toward society and the environment.

Curriculum coverage

	Topic	Sub topic	Coverage
Year 12	Unit 2 Principles and Applications of Chemistry	Atomic and electronic structure	Relationship between the periodic table and atomic structure; Electronic structure; Ionisation energy
		Bonding and structure	Metallic bonding and giant metallic structures; Ionic bonding and giant ionic structures; Covalent bonding and molecules; Comparing physical properties of different types of structures; Molecular shapes; Electronegativity and polarity; Intermolecular forces
		Periodicity	Changes in physical properties across period 3; Oxidation and Reduction; Reactivity trends across period 3; Predicting trends across other periods
		Physical chemistry	Moles and quantitative calculations; Chemical kinetics; Chemical energetics; Chemical equilibrium; Application of chemical kinetics, energetics and equilibrium to the chemical industry; Application of green chemistry to the chemical industry
		Organic chemistry	Use of key terms in organic chemistry; Structure of organic compounds; Naming organic compounds; Isomerism; Sigma and pi molecular orbitals in alkanes and alkenes, Properties of organic molecules; Reactions of organic molecules; Understanding the industrial and environmental impacts of organic chemistry
	Unit 3 Principles and Applications of Physics	Waves and optical fibres	Key terminology of waves; Comparing types of waves; Wave calculations; Refraction; Principles of optical fibres; Uses of electromagnetic waves in communication
		Forces in transportation and Newton's laws	Measuring and representing motion; SI units; Vectors and scalars; Motion calculations; Laws of motion; Inertia, mass and weight;
		Electrical circuits and the transfer of energy	Use of electrical components and circuits; Circuit calculations; Electrical energy usage; Energy transfers; Changes of state
	Unit 4 Practical Scientific Procedures and Techniques	Determine chemical concentration and composition of substances	Calibrating laboratory equipment; Preparation and standardisation of solution using titration; Determination of purity of organic compounds; Evaluating accuracy and reliability using critical thinking skills
		Investigate concentration and distribution of biological components	Colorimetry; Plant growth
		Undertake physical procedures to examine energy transfer	Transfer of thermal energy and cooling curves; Transfer of energy through electrical circuits; Transfer of energy from a renewable resource
		Review personal development of scientific skills	Understanding personal responsibility when developing skills; Interpersonal skills; Professional practice

Curriculum Coverage continued:

	Topic	Sub Topic	Coverage
Year 13	Unit 1 Principles and Applications of Biology	Structure and function of cells and tissues	<i>Names and functions of organelles in prokaryotic and eukaryotic cells; Structure and function of specialised cells</i>
		Structure and function of biological molecules	<i>Structure and function of water; Structure and function of carbohydrates; structure and function of proteins; Structure and function of nucleic acids; Structure and function of lipids</i>
		Cellular transport and enzyme activity	<i>Cell transport mechanisms; enzymes and biological catalysts; Factors affecting enzyme activity; Homeostasis</i>
	Unit 6 Contemporary Issues in Science	Investigate contemporary scientific issues that impact the global population and environment	Students will investigate scientific projects over the last 30 years. They will describe how they have been implemented, the effects they have had on people and the environment, including whether they have raised any ethical issues.
		Examine the effect different organisations have on contemporary science	Students will identify different organisations and the influence they have had on contemporary issues in science. Students will examine the methods used by organisations and the effectiveness they have
		Understand how to evaluate and report scientific information	Students will understand different types of scientific reporting and the recipient they're targeted at and level of understanding. Students will examine the reliability of information and disinformation along with source reporting and referencing. Students will also write articles on scientific issues that are suitable for a general and professional audience.

Wider Key Stage 5 Curriculum

Homework expectations - Students will be set independent work that will encourage them to use their study periods wisely and practice the new skills that they need for exam units and coursework units. Homework tasks for KS5 applied science students might include researching scientific concepts, completing data analysis, answering extended-response questions, preparing investigation write-ups, or revising past exam questions. Students also have access to a range of resources via Microsoft Teams.