



CURRICULUM OVERVIEW

Science

Key Stage 3 Curriculum Milestones

By the end of Year 7 students will be able to:

- Recall and use key scientific vocabulary accurately across Biology, Chemistry and Physics.
- Describe fundamental scientific ideas about cells and organisms, particles and materials, forces and energy.
- Identify patterns, similarities and differences in observations and simple data.
- Follow written and verbal methods to carry out practical work safely and responsibly.
- Identify independent, dependent and control variables in a simple investigation.
- Record observations and measurements clearly in tables, using appropriate units.
- Present simple data in a suitable graph and describe the pattern shown.
- Use evidence from observations and results to write a basic scientific conclusion.

By the end of Year 8 students will be able to:

- Explain a wider range of scientific ideas using accurate vocabulary, models and examples.
- Make links between ideas across Biology, Chemistry and Physics and apply them in familiar situations.
- Use particle, cellular and energy models to explain observations and predict outcomes.
- Select appropriate apparatus and construct a clear method for a guided investigation.
- Identify variables and explain how they should be controlled to produce valid results.
- Measure with increasing accuracy and record quantitative and qualitative data appropriately.
- Plot and interpret line graphs, bar charts and other suitable representations of data.
- Use results to form evidence-based conclusions and identify anomalies or limitations.
- Complete straightforward scientific calculations, showing working and using correct units.

By the end of Year 9 students will be able to:

- Apply secure scientific knowledge across Biology, Chemistry and Physics to familiar and unfamiliar contexts.
- Explain processes and relationships using appropriate scientific models, terminology and linked reasoning.
- Analyse information from text, diagrams, tables and graphs to identify trends and draw conclusions.
- Plan a valid investigation by selecting apparatus, identifying variables and considering accuracy and safety.
- Carry out practical procedures with increasing independence, precision and attention to risk.
- Evaluate methods and data by considering uncertainty, repeatability, reproducibility and possible improvements.
- Use mathematical skills, equations and units to solve multi-step scientific problems.
- Construct extended scientific explanations that use evidence and logical chains of reasoning.
- Recognise how scientific evidence develops and evaluate the benefits, risks and limitations of scientific applications.



Key Stage 4 Curriculum Milestones

By the end of Year 11 students will be able to:

- Recall and connect the core knowledge, key terminology and required ideas across GCSE Biology, Chemistry and Physics.
- Apply scientific knowledge and understanding to familiar, unfamiliar and real-world contexts.
- Use models, theories and evidence to explain processes, relationships and observed phenomena.
- Select and use equations, rearrange formulae and complete multi-step calculations with appropriate units and significant figures.
- Interpret and analyse information presented in diagrams, tables, graphs and unfamiliar data sets.
- Plan valid investigations, including appropriate apparatus, variables, controls, measurements and risk management.
- Carry out required practical techniques accurately and explain the purpose of key stages in a method.
- Evaluate experimental methods and evidence by considering uncertainty, accuracy, precision, repeatability, reproducibility and sources of error.
- Draw justified conclusions from qualitative and quantitative evidence and identify anomalies or limitations.
- Communicate scientific ideas clearly in short and extended responses using precise terminology and logical, evidence-based reasoning.

Key Stage 5 Curriculum Milestones

By the end of Year 13 students will be able to:

- Demonstrate detailed and coherent knowledge across their chosen A level science specification.
- Integrate ideas from different topics to explain complex biological, chemical and physical systems.
- Apply principles, models and theories to unfamiliar, synoptic and real-world contexts.
- Use precise subject-specific terminology, symbols, conventions and scientific notation.
- Select, rearrange and combine equations to solve demanding multi-step quantitative problems.
- Use appropriate units, prefixes, standard form, significant figures and estimates, checking whether answers are physically or scientifically reasonable.
- Interpret complex information from graphs, tables, diagrams, spectra and extended data sets.
- Analyse patterns and relationships quantitatively, including gradients, intercepts, proportionality and rates of change where appropriate.
- Plan valid and reliable investigations independently, justifying variables, controls, apparatus, measurements, sampling and risk management.
- Carry out practical techniques competently and accurately, recording observations and raw data in an appropriate form.
- Process experimental data using suitable calculations, graphical techniques and relevant statistical tests where appropriate.
- Evaluate methods and evidence critically by considering uncertainty, accuracy, precision, validity, reliability and systematic and random error.
- Draw justified conclusions, distinguish correlation from causation and recognise when evidence is insufficient.
- Construct clear extended responses that develop logical, evidence-based arguments and evaluate alternative explanations.
- Work independently by using feedback, wider reading and purposeful revision to identify and address gaps in knowledge and practical competence.