

Science Course Structure In Key Stage 3

In Years 7 and 8 students follow a scheme of work written within school to match the National curriculum programme of study. The topics encompass both theoretical and investigative work and are designed to improve students' scientific skills as well as their knowledge. The progress of students is formally assessed each half term. Different teachers will usually teach within their specialist areas

The Key Stage 3 units covered are as follows:

	Autumn Term	Spring Term	Summer Term
Year 7	Atoms, elements and Compounds Cells and Reproduction Energy and Electricity	The Periodic Table Nutrition and Digestion Basic Forces	Earth and Atmosphere Ecology Space and Gravity
Year 8	Plants Waves, Light and Sound Elements, Compounds and the Periodic Table	Health and fitness Energy Changes Chemical Reactions	Genetics and Evolution Further Forces and Electricity The Earth and Its Resources

In Key Stage 4

In Years 9, 10 and 11 students follow the AQA GCSE Trilogy specification (AQA Combined Science 8464 or separate science subjects Biology 8461, Chemistry 8462, Physics 8463). Course details can be found here <http://www.aqa.org.uk/subjects/science/gcse>. The progress of students is formally assessed each half term.

Combined Science

<http://www.aqa.org.uk/subjects/science/gcse/combined-science-trilogy-8464>

Separate Science Biology

<http://www.aqa.org.uk/subjects/science/gcse/biology-8461>

Separate Science Chemistry

<http://www.aqa.org.uk/subjects/science/gcse/chemistry-8462>

Separate Science Physics

<http://www.aqa.org.uk/subjects/science/gcse/physics-8463>

All students begin the study of the three separate qualifications with a decision being taken at the start of Year 11, in the light of assessment results, about which GCSE qualifications students are best suited to studying. In 2017, 43% of students were entered for all three Science GCSEs (compared with 30% nationally). The grading of all the GCSE courses is on the 9-1 grading scale. There is no controlled assessment component but continual assessment of the practical skills of students takes place throughout the course with numerous opportunities being given to develop confidence in these. Questions on practical work form part of the examination assessment of the course.

A small number of students for whom the Combined Science GCSE qualification is extremely challenging will be dual entered for both this and the Entry level AQA qualification (AQA Course code 5960)

<http://www.aqa.org.uk/subjects/science/elc/science-5960>

Summary of Content - Biology

	Term 1	Term 2	Term 3
Year 9	B1 Cell structure and transport	B2 Cell division B3 Animal organisation	B3 Enzymes and digestion B4 Organising Plants and Animals
Year 10	B16 Adaptations, Interdependence and Competition B17 Organising an Ecosystem	B6 Preventing and treating Disease B7 Non Communicable Disease	B9 Respiration B13 Reproduction B14 Variation and Evolution

	B5 Communicable diseases	B8 Photosynthesis	
Year 11	B10 The Human Nervous System B11 Hormonal Control	B17 Organising Ecosystems B18 Biodiversity and Ecosystems	Revision for GCSE and examination preparation

Summary of Content - Chemistry

	Term 1	Term 2	Term 3
Year 9	C1 Atoms and Atomic Structure C2 Electronic Structure and Group 1/7 Chemistry	C3 Chemical Bonding and trends in Chemistry C8 Rates	C8 Equilibrium C9 Hydrocarbons and crude oil
Year 10	C10 Chemical Analysis C4 Quantitative Chemistry C5 Patterns of Reactivity	C6 Metal Extraction C7 Energy transfers	C8 Equilibrium – quantitative treatment C13 The Atmosphere C14 Chemical Resources
Year 11	C3.11 Nanoscience C4 Yield and Atom Economy, titration calculations C7 Fuel Cells and batteries	C10 Organic Chemistry and Analysis C12 Tests for ions	C15 Making Fertilisers. The economics of the Haber Process. Ceramics and Composites Revision for GCSE and examination preparation

Summary of Content - Physics

	Term 1	Term 2	Term 3
Year 9	P3 Energy and Resources P2 Energy transfer by Heating	P1 Conservation and dissipation of energy	P12 Waves Properties
Year 10	P9 Motion P8 Vectors, scalars and forces between objects P10 Forces and motion	P4 Electricity P5 Electrical power and energy transfer P7 Nuclear energy	P6 Density and gas pressure P13 The electromagnetic spectrum
Year 11	P6 Kinetic Theory P11 Pressure and surfaces P14 Light P8 Moments	P15 Magnetic Fields P16 The Solar System	P12 Sound Revision for GCSE and examination preparation

In Key Stage 5

Biology A Level (OCR Biology A H420)

<http://www.ocr.org.uk/qualifications/as-a-level-gce-biology-a-h020-h420-from-2015/>

The Science of Life: Biology involves the study of a wide range of exciting topics, ranging from molecular biology to the study of ecosystems, and from microorganisms to mammoths.

In the first year you will study these main topics: Cells, Biological Molecules, Transport in Plants and Animals, Biodiversity, Disease and Evolution, and practical skills are embedded throughout the course to sharpen your investigative skills. Between them, these topics give a solid grounding in Biology.

Year two helps you build on that firm foundation and, like year one, has academic topics with practical skills embedded throughout. If all of these skills are met you will also gain a 'Biology Practical Endorsement' alongside your A Level. The academic topics include Communication, Homeostasis, Energy, Genetics, Evolution and Ecosystems.

AS Outline:

Module 1 – Development of practical skills in Biology

Module 2 – Foundations in Biology

Module 3 – Exchange and Transport

Module 4 – Biodiversity, Evolution and Disease

A2 Outline (All of the above plus the following modules):

Module 5 – Communication, Homeostasis and Energy

Module 6 – Genetics, Evolution and Ecosystems

All the assessment of this linear course is by examination at the end of the course. Practical skills are developed throughout the course and a portfolio of practical work is used to award a practical skills endorsement to the A Level.

Chemistry A Level (Ed Excel Chemistry)

<https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/chemistry-2015.html>

The content of this wide ranging course includes areas of organic, inorganic and physical chemistry. An A Level in Chemistry allows you to develop a range of generic skills requested by employers and universities as well as range of practical skills such as

- Effective problem-solver
- Effective communicator
- Ability to handle data allowing you to demonstrate information retrieval skills
- Ability to confidently use of numeracy and ICT.
- Ability to work effectively as part of a group
- Developing team participation and leadership skills
- Ability to select appropriate qualitative and quantitative methods, recording your observations and findings accurately and precisely
- Critically analyse and evaluate the methodology, results and impact of experimental and investigative activities.

All the assessment of this linear course is by examination at the end of the course. Practical skills are developed throughout the course and a portfolio of practical work is used to award a practical skills endorsement to the A Level.

Physics A Level (OCR Physics A H558)

<http://www.ocr.org.uk/qualifications/as-a-level-gce-physics-a-h158-h558/>

The content of this course gives a wide ranging introduction to modern Physics, including particle physics, electric and magnetic fields, waves, and motion.

We aim to foster an interest in and enthusiasm for Physics as it is at the heart of almost all technology from the smallest particles to the universe.

The course helps an appreciation of how society may make decisions about scientific issues and how physics contributes to the development and success of the economy and society.

Develop an understanding of the relationship between the different areas of physics and their significance.

All the assessment of this linear course is by examination at the end of the course. Practical skills are developed throughout the course and a portfolio of practical work is used to award a practical skills endorsement to the A Level.

BTEC National Extended Certificate in Applied Science (Level 3 A Level equivalent course)

<https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html>

This is an Applied Science course equivalent in worth to one A Level. It is recognised and valued by both universities for UCAS entrance and by employers. Assessment is both through examination and through assignments leading to a portfolio of evidence

The Units studied are:

Unit 1: Principles and Applications of Science

Unit 2: Practical and Scientific Procedures and Techniques

Unit 3: Science Investigation Skills

Unit 10: Biological Molecules and Metabolic Pathways
