



Science

Key Stage 3 Science

The principal focus of science teaching in key stage 3 is to develop a deeper understanding of a range of scientific ideas in the subject disciplines of biology, chemistry and physics. Pupils begin to see the connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding. Examples of these big ideas are the links between structure and function in living organisms, the particulate model as the key to understanding the properties and interactions of matter in all its forms, and the resources and means of transfer of energy as key determinants of all of these interactions. Pupils are encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations. Pupils develop their use of scientific vocabulary, including the use of scientific nomenclature and units and mathematical representations.

Key stage three science is taught over two years, which prepares them for the challenges of GCSE.

Year 7 topics

Forces	<ul style="list-style-type: none">- Speed- Gravity
Electromagnets	<ul style="list-style-type: none">- Voltage & resistance- Current
Energy	<ul style="list-style-type: none">- Energy Costs- Energy Transfer
Waves	<ul style="list-style-type: none">- Sound- Light
Matter	<ul style="list-style-type: none">- Particle Model- Separating mixtures
Reactions	<ul style="list-style-type: none">- Metals and non-metals- Acids and Alkalis
Earth	<ul style="list-style-type: none">- Earth Structure- Universe
Organisms	<ul style="list-style-type: none">- Movement- Cells
Eco-System	<ul style="list-style-type: none">- Interdependence- Plant Reproduction
Genes	<ul style="list-style-type: none">- Variation- Human Reproduction



Year 8 topics

Forces	<ul style="list-style-type: none">- Contact Forces- Pressure
Electromagnets	<ul style="list-style-type: none">- Electromagnets- Magnetism
Energy	<ul style="list-style-type: none">- Work- Heating and cooling
Waves	<ul style="list-style-type: none">- Wave effects- Wave Properties
Matter	<ul style="list-style-type: none">- Periodic table- Elements
Reactions	<ul style="list-style-type: none">- Chemical energy- Types of reaction
Earth	<ul style="list-style-type: none">- Climate- Earth resources
Eco-system	<ul style="list-style-type: none">- Respiration- Photosynthesis
Genes	<ul style="list-style-type: none">- Evolution- Inheritance

Key Stage 4

In Key Stage 4, pupils will study the new combined science Edexcel GCSE. Teaching in the sciences in key stage 4 continues with the process of building upon and deepening scientific knowledge and the understanding of ideas developed in earlier key stages in the subject disciplines of biology, chemistry and physics.

For some students, studying the sciences in Key Stage 4 provides the platform for more advanced studies, establishing the basis for a wide range of careers. For others, it will be their last formal study of subjects that provide the foundations for understanding the natural world and will enhance their lives in an increasingly technological society.

Science is changing our lives and is vital to the world's future prosperity, and all students are taught essential aspects of the knowledge, methods, processes and uses of science. Students are helped to appreciate the achievements of science in showing how the complex and diverse phenomena of the natural world can be described in terms of a number of key ideas relating to the sciences which are inter-linked, and which *are* of universal application.



Assessment:

There are six papers: two biology, two chemistry and two physics. Each of the papers will assess knowledge and understanding from distinct topic areas with the following core style.

- 100% Examination
- Students will be entered for either Foundation or Higher Tier
- Each of the six papers contributes equally to the final grade

Questions: Multiple choice, structured, closed short answer, and open response.

Triple Science

Key Stage 4 Curriculum

Year 9, Year 10 & Year 11

Triple Science GCSE encompasses the three traditional science GCSEs of Biology, Chemistry and Physics. Each GCSE is certificated independently. All GCSE sciences are taught with practical work being used to back up theoretical ideas. There will be a significant level of mathematical skill required in some parts of the course. Although not essential, Triple Science would be the recommended pathway for those students wishing to study A level science subjects. Due to the rigour of studying three science GCSEs, this option is only recommended to higher attaining students.

Triple science students will study an enhanced version of the same topics as the combined science award with extra content designed to take students learning to a higher level than the combined award.

Biology Chemistry and Physics will have two terminal examinations.

- 100% Examination
- Students will be entered for either Foundation or Higher Tier

Questions: Multiple choice, structured, closed short answer and open response.



Key Stage 5

Biology OCR A Level

A flexible approach where the specification is divided into topics, each covering different key concepts of Biology. Teaching of practical skills integrated with theoretical topics and they are assessed through the written papers. The Practical Endorsement will also support the development of practical skills.

- Module 1 Development of practical skills in Biology
- Module 2 Foundations in Biology
- Module 3 Exchange and Transport
- Module 4 Biodiversity, Evolution and Disease
- Module 5 Communications, Homeostasis and Energy
- Module 6 Genetics, Evolution and Ecosystem

Chemistry OCR A Level

A flexible approach where the specification is divided into topics, each covering different key concepts of Chemistry. Teaching of practical skills integrated with theoretical topics and they are assessed both through written papers and practical endorsement.

- Module 1 Development of Practical Skills in Chemistry
- Module 2 Foundations in Chemistry



- Module 3 Periodic Table and Energy
- Module 4 Core Organic Chemistry
- Module 5 Physical Chemistry and Transition Elements
- Module 6 Organic Chemistry and Analysis

Physics OCR A Level

A flexible approach where the specification is divided into topics, each covering different key concepts of Physics. As students progress through the course, they build on their knowledge of the laws of physics, applying their understanding to areas from subatomic particles to the entire universe.

- Module 1 Development of Practical Skills in Physics
- Module 2 Foundations of Physics
- Module 3 Forces and Motion
- Module 4 Electrons, Waves and Photons
- Module 5 Newtonian World and Astrophysics
- Module 6 Particles and Medical Physics.

At Key stage 5 we also offer also BTEC Level 3 National Extended Certificate in Applied Science (360 GLH) 601/7436/5. The course is equivalent in size to one A-Level. It is comprised of 4 units, two are internally assessed coursework, and 2 are externally assessed.



Unit 1 Principles and Applications of Science I – examined

This unit covers some of the key science concepts in biology, chemistry and physics.

Unit 2 Practical Scientific Procedures and Techniques – Coursework

Learners will be introduced to quantitative laboratory techniques, calibration, chromatography, calorimetry and laboratory safety, which are relevant to the chemical and life science industries.

Unit 3 Science Investigation Skills - Practical assessment

Learners will cover the stages involved and the skills needed in planning a scientific investigation: how to record, interpret, draw scientific conclusions and evaluate.

Unit 8 Physiology of Human Body Systems – Coursework

Learners will focus on the physiological makeup of three human body systems (musculoskeletal, lymphatic and digestive), how the systems function, and what occurs during dysfunction.

BTEC Nationals are widely recognised by industry and higher education as the signature vocational qualification at Level 3. They provide progression to the workplace either directly or via study at a higher level. Well over 100,000 BTEC students apply to UK universities every year and their BTEC Nationals are accepted by over 150 UK universities and higher education institutes for relevant degree programmes either on their own or in combination with A Levels.



Level 3 BTEC Applied Science Extended Certificate

The course involves:

The practical investigation of science topics. Developing practical, planning and evaluating skills. Learning through independent research and study. Understanding the correct functioning of human body systems. Analysing science problems and developing practical methods of investigation. Working with numbers and evaluating practical methods.

Studying Applied Science can lead to careers in: lab-based research and development, pharmaceutical, clinical or forensic analysis, sport science analysis, engineering development, and further or higher education.

Units of study:

Investigations Skills

The topic areas covered in this unit include: animal and plant cells; tissues; atomic structure and bonding; chemical and physical properties of substances related to their uses; waves and their application in communications. This unit has a large practical component and is assessed by an external written paper at the end of year 12 (25% of marks)

Practical scientific techniques

Learners will be introduced to quantitative laboratory techniques, calibration, chromatography, calorimetry and laboratory safety which are relevant to the chemical and life science industries. This unit is predominantly practical based and is assessed by 4 written practical assignments. (25% of marks)

Science Investigation Skills

Learners will cover the stages involved and the skills needed in planning a scientific investigation: how to record, interpret, draw scientific conclusions and evaluate their practice. The unit is assessed through a set practical investigation and completion of a written task book reporting and evaluating the results (33% of marks)

Physiology of Human Body Systems

The physiological make-up of the musculoskeletal, lymphatic and digestive systems, how the systems function and what occurs during dysfunction. The unit will be of particular interest if you are interested in sport, body-building and maintaining a healthy body. Assessed by 4 written research assignments. (17% of marks)