Year 9, 10 and 11

GCSE Science - AQA

Students joining us from 2015 will the study for the new AQA GCSE science specifications which are graded 9-1, and examined for the first time in 2018. This new specification aims to inspire and challenge students of all abilities and aspirations.

The study of GCSE Science begins in Year 9 and is completed at the end of Year 11. This is done through either 'Separate Sciences' commonly referred to as triple science, or the combined 'Trilogy' specification commonly referred to as double science. During either route students will study biology, chemistry and physics, taking part in engaging "required practicals" to develop not only their scientific understanding but their practical skills.

What will students be studying?

Biology – *1. Cell biology. 2. Organisation. 3. Infection and response. 4. Bioenergetics. 5. Homeostasis and response.6. Inheritance, variation and evolution. 7. Ecology*

Chemistry – *1 Atomic structure and the periodic table.2 Bonding, structure, and the properties of matter. 3 Quantitative chemistry.4 Chemical changes. 5 Energy changes. 6 The rate and extent of chemical change. 7. Organic chemistry. 8 Chemical analysis. 9 Chemistry of the atmosphere.*

Physics – *1 Energy. 2 Electricity. 3 Particle model of matter. 4 Atomic structure. 5 Forces. 6 Waves. 7. Magnetism and electromagnetism. 8 Space physics*

You can find more details by following the link:
AQA GCSE Science Specifications

Results

Biology 2016	**Shelley**	**Nationally**
A*-A	45%	42%
A*-C	97%	90%
Chemistry 2016	**Shelley**	**Nationally**
A*-A	50%	43%
A*-C	98%	90%
Physics 2016	**Shelley**	**Nationally**
A*-A	50%	43%
A*-C	99%	91%
Additional Science 2016	**Shelley**	**Nationally**
A*-A	6%	10%
A*-C	70%	60%

Post-16

A level Biology – AQA

Year 12 - AS Level:

The course is assessed by 2 exams, of 1hr 30 each, covering the AS topics of: Biological molecules, Cells, Organisms exchange substances with their environment, Genetic information, Variation and Relationships between organisms, plus relevant practical skills.

Year 13 - A Level:

The course is assessed by 3 exams of 2hrs each, covering the AS topics and the year 2 A-level topics of energy transfers in and between organisms, organisms respond to changes in their internal and external environments, genetics, populations, evolution and ecosystems and the control of gene expression.

Practical skills are taught formally throughout the course in the form of 'required practicals' which include

- using microscopes to see cell division
- dissection of animal or plant systems
- aseptic technique to study microbial growth
- investigating activity within cells
- investigating animal behaviors
- investigating distributions of species in the environment.

Possible Career Routes Include:

- Animal technology, Microbiology, Conservation, Research, Drug development, sales and marketing, Sports Science and Physiology, Forestry, Teaching, Horticulture, Veterinary Science and Medicine.

You can find more resources by following the link: AQA AS and A-level Biology

A level Chemistry – AQA

Year 12 - AS Level:

The course is assessed by 2 exams, of 1hr 30 each, covering the three chemistry specialisms: physical, organic and inorganic chemistry. Within the specialisms student will study atomic structure, amount of substance, bonding, energetics, kinetics, chemical equilibria and Le Chatelier's principle, periodicity, alkanes, halogenoalkanes, alkenes, alcohols, organic analysis, Group 2 the alkaline earth metals, Group 7(17) the halogens.

Year 13 - A Level:

The course is assessed by 3 exams of 2hrs each, covering physical, organic and inorganic chemistry. All the AS material is examinable along with the year 2 A-level including thermodynamics, rate equations, the equilibrium constant Kp, electrode potentials and electrochemical cells Including properties of Period 3 elements and their oxides, transition metals, reactions of ions in aqueous solution including optical isomerism, aldehydes and ketones, carboxylic acids and derivatives, aromatic chemistry, amines, polymers, amino acids, proteins and DNA, organic synthesis, NMR spectroscopy, chromatography.

Practical skills are taught formally throughout the course in the form of required practicals which include –

- measuring energy changes in chemical reactions
- tests for identifying different types of compound
- different methods for measuring rates of reaction
- studying electrochemical cells
- preparation of organic solids and liquids
- TLC, an advanced form of chromatography for more accurate results.

Possible Career Routes Include:

- Environmental science, Medicine, Pharmaceuticals, Energy, Civil engineering, Toxicology, Teaching, Research, Science writing and Space exploration.

You can find more resources by following the link: AQA AS and A-Level Chemistry

A level Physics – AQA

Year 12 - AS Level:

The course is assessed by 2 exams, of 1hr 30 each, covering the AS topics of: Measurements, Particles and radiation, Waves, Mechanics and materials and Energy, plus relevant practical skills.

Year 13 - A Level:

The course is assessed by 2 exams of 2 hrs each, covering the AS topics and the 2nd year A-level topics of: Further mechanics and thermal physics, fields and their consequences and Nuclear physics. Practical skills are taught formally throughout the course in the form of required practicals which include

- investigating interference and diffraction of laser light
- measuring acceleration due to gravity
- investigating systems that oscillate
- investigation of the links between temperature
- volume and pressure
- safe use of ionising radiation
- investigating magnetic fields
- determination of resistivity of a wire using a micrometer, ammeter and voltmeter.
- investigation of Boyle's (constant temperature) law and Charles'(constant pressure) law for a gas.

Possible Career Routes Include:

- -Communication, Environment and climate, Medicine, Civil engineering, Energy sector, Education, Sports and game industry and Music, TV and film industries.

You can find more resources by following the link: AQA AS and A-Level Physics

A level Applied Science – AQA

Year 12 - AS Level:

In Year 12 three units of work are completed. Units 1 and 3 are assessed internally as portfolio projects and Unit 2 is assessed as an external exam in June. The portfolio units account for 66.6% of the overall course grade. The topics include: Science at work, Energy transfer systems and Analytical techniques.

Year 13 - A Level:

In Year 13 a further three units are completed, two are assessed internally as portfolio projects and one is assessed as an external exam in January.

Applied Science looks at Science through its uses in the real world. It enables students to develop a broad understanding of scientific principles as well as focussing on a specific pathway e.g. heath care, applications of chemistry, ecology, applied science in medicine, environmental or laboratory work.

In addition, the qualification covers a mixture of units from the main subject areas of Biology, Chemistry, and Physics with a clear practical emphasis, providing students with the essential skills, knowledge and understanding of Science.

Possible Career Routes Include:

-Radiography, Biomedical sciences, Nursing, Business studies, Sports science, Law and Occupational therapy.

You can find more resources by following the link: AQA Applied AS and A-level Science

The science team at Shelley College

J Rhodes – Director of Science

J Wyatt – Associate Director of Science

R Storr – Associate Director of Science

K Rilon – Acting Director of Biology

H Dixon – Director of Biology (maternity)

G Dyson – Director of Applied Science

R Abu – Teacher of Science

I Coneron – Teacher of Science

D Bardsley – Teacher of Science

V Joyce – Teacher of Science

A Gibson – Teacher of Science

A Gorse – Teacher of Science

B Tsiga – Teacher of Science

J Williams – Teacher of Science

A Brown – Physics Technician

S Hannon – Biology Technician

F Lodge – Chemistry Technician