Science

Entry Level

In year 8 students consolidate and deepen their scientific knowledge in preparation for their GCSE years. Students are taught by subject specialists and currently study two biology units, two physics and two chemistry units. Students will be entered for entry level prior to starting their GCSE's.

Students sitting the science entry level exam can either submit three teacher designed assessments (TDA - practical investigations) from three different units and sit three externally sat assessments (ESA) to gain a Single Award or they may choose to enter a TDA and ESA for each unit to gain a Double Award.

Biology GCSE AQA 9-1

The pupils at GCSE level follow the AQA Biology 9-1 GCSE topic higher tier or foundation tier. This enables students to learn about how the human body works, the structures that make it work and how to keep it healthy.

The topics covered are:

- Cells
- Organisation
- Infection and Response
- Bioenergetics
- Homeostasis
- Inheritance
- Evolution
- Ecology

The pupils are given many opportunities to carry out practical investigations. There is a science lab in school which enables them to carry out investigations such as looking how substances diffuse through a semi permeable membrane and using a microscope to observe cell structures. Students will test the effectiveness of different antiseptics on killing bacteria, as well as factors that affect the rate of transpiration in leaves. Students will develop their numeracy skills during practical work, as it involves drawing tables, taking accurate measurements, calculating means, percentage changes and constructing graphs.

Physics GCSE AQA 9-1

The pupils at GCSE level follow the AQA Physics 9-1 GCSE topic higher tier or foundation tier. This enables students to gain knowledge and practical experience about the underlying principles of how things work – from electrical circuits via X-ray machines to fairground rides.

The topics covered are:

- Energy
- Electricity
- Particle model of matter

- Atomic structure
- Forces
- Waves
- Magnetism and electromagnetism
- Space physics

The variety and range of topics covered for example, the medical application of physics as well as household electricity and appliances allow students to sharpen their observational skills. Through practical enquiry students will gain an understanding of how physics can affect society and the environment; how hypotheses, evidence, theories and explanations work together. They will improve observational, practical, modelling, enquiry and problem-solving skills as well as skills in communication, maths and the use of technology in scientific contexts.

They are also given the opportunity to visit off site educational facilities when they interact with other scientific resources, for example the investigations in to bacterial evolution which took part in at TechniQuest.

A-Level Biology

A level Biology is a very challenging but popular subject as it answers many questions that you may have such as how do the cells in your body make 10,000 different types of protein? How did Gregor Mendel describe laws of inheritance many years before the discovery of DNA? How does your body maintain its delicate equilibrium, homeostasis, amid its inner hive of activity?

The course is broken up over the two years, where students will study two units in their first year (AS Level). By dividing each unit up into short sections, confidence and knowledge will develop progressively throughout the course. This will be built upon with practical enquiry which is embedded throughout the course. Practical skills are essential in biology and are gained throughout the course along with analytical and problem-solving skills. Studying biology will also involve discussion, debate, individual work and research.

Students study the WJEC specification which is assessed over the two years. At the end of year one students will sit two papers. Unit one (20%) includes basic biochemistry and cell organisation. Unit two (20%) covers biodiversity and physiology of body systems. Then in the second year, students will sit a further two papers and carry out a practical examination. A2 unit three includes energy, homeostasis and the environment (25%). Unit four covers variation, inheritance and options from immunology and disease, human musculoskeletal anatomy or neurobiology and behaviour (25%). Finally, unit five worth 10% of the qualification allows students to demonstrate their ability to carry out an investigation and to analyse and evaluate experimental data under controlled conditions.

'Biology is the study of complicated things that have the appearance of having been designed with a purpose'.

Richard Dawkins

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