**SCIENCE**

**KS3**

All students commence their Science journey at the start of Year 7 with the Investigations unit, which introduces them to safe working in the laboratory and allows them to gain confidence using equipment such as beakers, balances, and of course the classic Bunsen burners! Beyond this point, students embark on an adventure of discovery of a range of different topics within the three core disciplines of Biology, Chemistry and Physics, starting with the key themes of Cells, Particles and Forces, and then branching out into more specific topics. These include:

**Biology –** Reproduction, Breathing and Digestion, Respiration and Photosynthesis, and Evolution

**Chemistry –** Acids and Alkalis, Periodic Table, Reactions and Energy, Atmosphere and Earth

**Physics** – Circuits and Electricity, Waves, Magnetism, Energy, Gravity and the Universe

The main focus of Science teachers in Year 7 and 8 is to build students’ skills levels, particularly with carrying out scientific testing and investigations in a safe and effective way, and to enhance their knowledge of the topics specified by the National Curriculum for KS3. Students will also work towards our key objective of improving scientific literacy, enabling them to engage fully with the more complex topics in KS4 (GCSE) with greater ease.

Students are assessed regularly through the following ways:

**Drill Tests** require students to recall information learned from their Knowledge Organisers

**DMAs** (Deep Mark Assessments) are our “end of unit tests” which give students a chance to prove their knowledge and understanding of the Science content they learn as they go.

**Formal Assessments** – students sit two formal exams a year which are used to support feedback and also setting of students in the following term.

Students should expect to receive one hour of homework each week which will focus on memorisation of key facts, and practice of their literacy and numeracy skills.

**KS4**

In KS4 Science students study one of the following courses:

* AQA Combined Science
* AQA Triple Science (Biology, Chemistry and Physics)

Students are placed into “trial” Triple classes at the start of Year 9 and usually a single class is selected to progress with Triple Science from Year 10 onwards; everybody else continues with our Combined (Double) Science GCSE qualification.

From Year 9 students have a separate teacher for Biology, Chemistry and Physics (including all Combined Science students). This allows us to provide students with an enhanced experience of each scientific discipline, as they are taught by an expert in each topic. The KS4 topics are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Biology | Chemistry | Physics |
| Year 9 | Cells, Ecology, Organisation | Atoms Elements Compounds and Mixtures, Bonding and Structure, Metal Reactions | Particle Model, Atomic Structure, Energy |
| Year 10 | Infections, Bioenergetics, Homeostasis, Inheritance | Electrolysis, Energy Changes, Organic Chemistry | Electricity, Forces |
| Year 11 | Variation (and final revision) | Rates of Reaction, Earth’s Atmosphere and Resources | Waves, Magnetism |

Students are internally assessed regularly with End-of-Unit tests throughout Key Stage 4 and are required to score within a grade of their target, so careful revision is required!!

For their GCSE assessments, students sit exams as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Biology | Chemistry | Physics |
| Combined Science | 2x 1hr 15min papers | 2x 1hr 15min papers | 2x 1hr 15min papers |
| Triple Science | 2x 1hr 45min papers | 2x 1hr 45min papers | 2x 1hr 45min papers |

Students are set a programme of homework designed to improve their knowledge and recall of scientific information, and to enhance their exam skills. The homework is comprised of

* A set of electronic questions via our educational app Tassomai
* Exam questions printed and given to students.

Practical work remains at the heart of our Science curriculum in Key Stage 4, with students challenged to complete a wide range of “required practicals” which range from fieldwork and food tests in Biology, to chemical titrations and endo/exothermic reactions in Chemistry, and calculating the resistance of a wire and building an electromagnet in Physics!

**KS5**

Science offers four qualifications at KS5:

**Biology**

Students study AQA Biology A-Level, a 2 year course with three 2hr terminal exams (no coursework element). The course delves into the deepest secrets of life, from the diffusion processes that allow living things to exchange substances with the environment, into the inner workings and bondings of the DNA that instructs our bodies how to construct the proteins that make us who we are. Our Biology course is perfect for students aspiring to medical careers or work in research or ecology, but unlocks a huge number of university courses when studied alongside Chemistry. The topics include:

**AS –** Biological Molecules, Cells, Exchange of Substances, DNA and Evolution

**A2** – Respiration and Photosynthesis, Homeostasis, Variation, Epistasis

Students complete 12x Required Practicals in order to gain their skills certification in Biology; the course is, however, entirely assessed by the three final exams.

**Chemistry**

Students study AQA Chemistry A-Level, a 2 year course with three 2hr terminal exams (no coursework element). The course challenges students with an in-depth involvement in Organic and Physical Chemistry, with a wide range of required and standard practicals that give students a chance to really discover the inner workings of a range of complex chemical reactions and processes. Our Chemistry course is great for students who aspire towards becoming Chemical Engineers, or who wish to work in medicine or pharmacy, and is particularly valuable for university entry when paired with Biology. The topics are covered as follows:

**AS –** Physical Chemistry 1, Organic Chemistry 1, Inorganic Chemistry 1

**A2 –** Physical Chemistry 2, Organic Chemistry 2, Inorganic Chemistry 2

Students complete 12x Required Practicals in order to gain their skills certification in Chemistry; the course is, however, entirely assessed by the three final exams.

**Physics**

Students study AQA Physics A-Level, a 2 year course with three 2hr terminal exams (no coursework element). The course immerses students in the key Physics concepts, allowing them to grasp processes such as Mechanics, Radiation and Quantum Phenomena, and Magnetic Fields. This course is perfect for students who aspire towards a future career in engineering or mechanics, and unlocks a wide range of university courses when studied alongside Maths. The topics include:

**AS** – Particles and Radiation, EM Radiation, Waves, Mechanics, Materials, Electricity

**A2** – Further Mechanics, Thermal Physics, Gravitational Fields, Nuclear Physics

Students complete a wide range of standard class practicals and 12x Required Practicals in order to gain their skills certification in Physics; the course is, however, entirely assessed by the three final exams.

**Forensic and Criminal Investigation**

Our popular FCI Course offers an Applied Science-style qualification to our students who want to continue learning Science into Key Stage 5, but for whom the A-Level courses might not be a good fit. It provides students with a sound basis in scientific principles, with a more in depth look at the topics and themes students have learned in GCSE and an emphasis on Scientific Skills. Students then go on to develop forensic analysis skills and are required ultimately to assess a crime scene and collect and process evidence! This course is great for students who prefer a course with a more accessible coursework element and fewer exams, but also, it would be great for any student with an interest in studying Forensics at university. It is particularly useful when paired with Biology, or Criminology.

The topics are covered as follows:

**Year 12 –** Principles of Science, Practical Procedures and Techniques, Science Investigation Skills

**Year 13 –** Forensic Investigation Procedures, Physiology of Human Body Systems, Environmental Forensics

Students complete a wide range of practicals which they are required to write up in a well organised way. The final qualification produces a grade that is either Pass, Merit or Distinction, and is assessed as follows:

* External Assessments are in place for two units: Principles of Science (3x exams lasting 40mins each) and Science Investigation Skills (Part A 45min exam, and Part B 1hr 30min exam).
* The remaining units are internally assessed through assignment briefs.