

- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- To be equipped with the scientific skills required to understand the uses and implications of science, today and for the future.
- To explore how scientific ideas, develop and how we learn by experimentation
- To enable all our students to develop scientific consciousness, from the subatomic to the intergalactic

Curriculum Implementation

KS3

KS3 Science is linked to the National Curriculum composites, comprising of Biology, Chemistry and Physics topics. Each component is around 6-7 weeks in duration with an assessment at the end of each topic and regular check and review points throughout.

The aim of KS3 is to enthuse students with appreciation of science learning and allow them to discover how things work. We aim to provide a grounding in the basic concepts of Biology, Chemistry and Physics as well as looking at scientific problem solving and use of evidence to develop theories and explanations. The emphasis of KS3 is on practical and investigative work with a constant effort to relate what we teach to the world around them.

TERM	Year 7	Year 8
1	Introduction to Science skills	Healthy body
2	Cells and interdependence Atoms and periodic table	Reactions in chemistry
3	Waves	Forces
4	Reproduction and evolution	Transport systems (plants and animals)
5	Matter	Earth's resources
6	Refining the Earth	National Grid

The sequencing of year 7 is based around introducing them to key science skills in the first few lessons for example graph skills, using Bunsen burners and measuring. They then study a Biology topic cells to help build their confidence as this is usually a key area that is covered well as KS2 and allows us as a department to build and develop on that knowledge. It also allows us to embed the basic/key knowledge needed in Biology

The second topic is based around the fundamentals of chemistry, this was second again to excite their inner scientists, as this involves a large number of experiments based around the basic knowledge of chemistry. It also gives a great opportunity to introduce students to the Periodic table – ‘a chemists best friend’

After that we then alternate between physics, biology and chemistry topics to allow students to experience a range of scientific components, while developing the skills needed across all three disciplines. These lessons are practically based as often as they can be to develop inquisitive scientists and enable a strong link to context.

The sequencing in year 8 is so the first two topics can review and build on the previous year 7 topics. Healthy body builds on cellular knowledge to an organ system level and reactions builds on the fundamentals of chemistry studied in year 7.

Again similar to year 7, the students alternate between physics, biology and chemistry topics to allow students to experience a range of scientific components, while developing the skills needed across all three disciplines. These lessons are practically based as often as they can be to develop inquisitive scientists and enable a strong link to context.

The sequencing of year 9 components is linked to a similar order to year 7 and 8. This enables students to make strong links between components and then apply this knowledge both scientifically and to context of science relating to the world around them. This enables students to develop the breadth and depth of their conceptual knowledge. This will also support students moving on to their KS4 journey in Science.

Students will also complete several practical's, after which they will complete, mark and improve a written piece of work, looking at key how science works knowledge, based on errors, graphs skills and writing a scientific method.

Topic	Year 9
Biology	Cells Organisation of systems Infectious diseases Respiration and photosynthesis
Chemistry	Periodic table Bonding Reaction energies Reactivity
Physics	Energy Electrical circuits Matter models Radiation

KS4

KS4 Science follows the AQA (9-1) Trilogy and Single Science pathways with a focus on building on previous knowledge from KS3 to develop conceptual knowledge and skills. Triple science is the demanding option for students and is designed for those who have a real love and aptitude for Science and who may wish to carry on their studies at A-level, classes are mixed but higher ability.

TERM	Year 10 Single Science		
	<i>Chemistry</i>	<i>Biology</i>	<i>Physics</i>
1	Chemical changes	Bioenergetics	Atomic structure
2	Energy changes	Homeostasis	Forces
3	Quantitative chemistry	Inheritance and variation	Waves
4	Rates of chemical change		
5	Organic chemistry	Ecology	Magnetism and electromagnetism
6	Chemical analysis		

TOPIC	Year 10 Combined
Biology	Bioenergetics Homeostasis Inheritance

Chemistry	Quantitative chemistry Rates of chemical changes Organic Chemistry Chemical analysis
Physics	Atomic structure Forces Waves Magnetism

Year 10 sequencing is in an order that allows students to link effectively but also recall and use previous knowledge. For example, quantitative chemistry requires students to understand the terms mass number and atomic number for several calculations.

TERM	Year 11 Single Science			Year 11 Trilogy Science
	<i>Biology</i>	<i>Chemistry</i>	<i>Physics</i>	
1	Cell biology	Periodic table	Energy	Cells/periodic table/energy
2	Organisation	Bonding	Electricity	Organisation/bonding/electricity
3	Infection and response	Chemistry of the atmosphere	Particle model of matter	Infection and response/ Particle model of matter
4	Ecology	Using Resources	Space	Ecology/Using resources
5	Revision	Revision	Revision	Revision
6	Exams	Exams	Exams	Exams

Year 11 sequencing is in an order that allows students to build on knowledge and develop their application of this knowledge effectively. The components are ordered so appropriate links can be made but allows learning to happen in a logical order.

Curriculum Impact

Regular low stakes retrieval practice is used across year groups, this allows students to check and review their own learning, while improving their recall of information that can then be used and applied to context, as well as link across subjects. Throughout topics there are regular check points for students which may consist of a piece of extended writing, drawing conclusions from investigations or mathematical skills in science. Teachers will feedback on these check points and provide students with individualised feedback and tasks to develop any areas of improvement needed.

This is allowing a high level of engagement in Science, allowing students to aim for mastery across Biology, Chemistry and Physics topics

Extended learning

Useful websites

https://www.youtube.com/channel/UCqbOeHaAUXw9II7sBVG3_bw - freesciencelessons

<https://www.senecalearning.com/>

Useful textbooks

CGP: Grade 9-1 GCSE Combined Science: AQA Revision Guide

Collins: Grade 9-1 GCSE Combined Science Trilogy Foundation AQA All-in-One Complete Revision and Practice