Science

Curriculum Intent

At Carnforth we are excited to teach science to every student who joins us, regardless of their starting points from Primary school. We aim that by the end of the 5 years at Carnforth, we have encouraged students to have confidence to ask questions about the world around them and how it works and given them the knowledge and skills to understand this.

Our curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. All students follow the same curriculum with scaffolded support where needed which is withdrawn as and when pupils are confident in a concept. KS3 covers the whole of the National Curriculum for Science and one Biology, Chemistry and Physics topic is taught each term. At KS4 we build on this knowledge and deliver AQA trilogy or triple science to all students.

We aim to prepare students thoroughly for the examination experience in year 11 by building in a culture of retrieval and interleaving from year 7, developing disciplinary knowledge as soon as they arrive at Carnforth. We promote the importance of Science by developing their knowledge of how science is part of everyday life, their awareness of developments in science and how scientists from all backgrounds contribute to the worldwide scientific community. Literacy skills are developed alongside scientific knowledge and skills, using guided reading material in all topics, exploring the origins of key root words and ensuring our lessons and assessment encourages the use of tier 3 language.

By the end of the course students should have a key understanding of the three areas of Biology, Physics and Chemistry. They will be able to apply scientific ideas and models to help them explain phenomena and events. Their skills will include being able to consider advantages and drawbacks of scientific and technological developments as well as respecting that people have ideas and opinions that may differ to theirs. We hope that by delivering an ambitious curriculum to all that we will encourage more and more students to pursue a scientifically academic pathway post 16.

Implementation

The science curriculum is heavily knowledge based which means the sequence of teaching has been designed in order to allow students to develop their disciplinary knowledge alongside developing the substantive knowledge across 24 different topics at KS4. The order of topics at KS3 reflects the need to develop basic understanding – e.g. students cover cells early in year 7 and so are prepared to look at how sperm and egg cells as specialised cells are involved in reproduction – a later topic and then later still how the reproductive organs work together as a system. As students move through KS3 they develop a mastery of concepts which makes the transition to KS4 in year ten smoother as they already have a sound base of knowledge from which to develop and understanding of more complex and often abstract concepts. This can be seen in detail on the curriculum plan document and a summary of topics covered below. Our retrieval and assessment model is designed to encourage students to learn more and remember more as they progress through the key stages.

Carnforth High School

Key Stage 3

Year 7 All 3 disciplines of science are studied during year seven. The topics are: Cells and organisation, Forces and motion, Atoms, Elements and Compounds, Space, States and separation, Reproduction, Chemical reactions and Diet and Health.

Year 8 The topics covered are: Genetics and Evolution, Electricity and magnetism, Acids and alkalis, Photosynthesis and respiration, Rocks, Energy, Interdependence and Ecology, Light and Sound

Year 9 The topics are: Cells mastery, Atomic structure, Energy in systems, Biological Organisation, Chemical bonding, Forces, Infection and response, Chemical change, Particle model of matter.

Key Stage 4

Year 10 In Biology learners go on to study processes such as Bioenergetics and Homeostasis in more detail, gaining a deeper understanding of how body systems work, while retrieving basic knowledge covered at KS3 – such as cells, and applying it in new contexts.
In Chemistry, learners look at chemical changes in more detail as well as energy changes in reactions, quantitative chemistry, rates of reactions and organic chemistry.
In Physics, learners look in detail about atomic structure, waves and forces.

Year 11 The remaining topics are taught in year 11. These allow students to use knowledge gained from the previous 2 years to understand more complex phenomena. Topic in Biology are Inheritance and Ecology. In Chemistry, Chemical analysis is covered as well as Chemistry of the Atmosphere and Using resources.
In Physics, students revisit electricity and link this with magnetism and for triple science students, they study Space.

Impact

Assessment

All exams are externally assessed as below:

Board	AQA
Course Type	GCSE

Component Title	Bio paper 1	Bio paper 2	Chem paper 1	Chem paper 2	Phys paper 1	Phys paper 2
Component Type	Exam	Exam	Exam	Exam	Exam	Exam
Structure	Multiple choice, structured, closed short answer, and open response					
Content	Biology topics 1–4: Cell Biology; Organisation; Infection and response; and Bioenergetics.	Biology topics 5–7: Homeostasis and response; Inheritance, variation and evolution; and Ecology.	Chemistry topics 8–12: Atomic structure and the periodic table; Bonding, structure, and the properties of matter; Quantitative chemistry; Chemical changes; and Energy changes.	Chemistry topics 13–17: The rate and extent of chemical change; Organic chemistry; Chemical analysis; Chemistry of the atmosphere; and Using resources.	Physics topics 18–21: Energy; Electricity; Particle model of matter; and Atomic structure.	Physics topics 22–24: Forces; Waves; and Magnetism and electromagnetism + Space (Phys only)
Value (%) **Trilogy** Triple	16.7 % 50%	16.7 % 50%	16.7 % 50%	16.7 % 50%	16.7 % 50%	16.7 % 50%
Length trilogy **Triple**	 1 hr 15 m 1 hr 45 m	 1 hr 15 m 1 hr 45 m	 1 hr 15 m 1 hr 45 m	 1 hr 15 m 1 hr 45 m	 1 hr 15 m 1 hr 45 m	 1 hr 15 m 1 hr 45 m
Date						

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