Science – Aims/Intent Science follows the National Curriculum

www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study

A high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, so students are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, students are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. Students are encouraged to understand how science can be used to explain what is occurring and to predict how things will behave, and analyse causes.

The aims in Science are that students will be taught:

1. To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
2. 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.
3. To be equipped with the scientific knowledge required to understand the uses and implications of science today and for the future.
4. To read and develop specific technical vocabulary.
5. All learners (including EAL, SEND and M.A.) to make strong progress.

How cultural capital is enhanced through Science:

Personal Development

Careers in Science and associated areas (Medicine/Veterinary, etc.) and information on further and higher education. Developing confidence through speaking to peers and discussing how what we are learning links to real jobs.

Social Development

Political and current affairs awareness.

Understanding that the social context of the formation of scientific ideas and laws causes social change.

Physical Development

Developing students' ability to use, manipulate and record raw data from scientific experimentation.

Reflecting in their work through evaluation of their results versus the expected results.

Spiritual Development

Through assemblies and collective worship. Through the studying of scientists who confronted religious points of view even to their own detriment.

Cultural Development

Cultural development of our way of thinking and working based around scientific discovery.

Moral Development

Through deep thought and discussion students are posed numerous moral questions. We explore these and hope that students are able to use evidence that they have obtained to form an opinion that is in line with society. Giving an opinion of the moral questions posed with a justification for their point of view.

How students' vocabulary is developed through Science:

- Students demonstrate an understanding of key words and vocabulary through their analysis of their experimental work in lessons.
- Students are encouraged to use technical vocabulary and understand what it means In relation to scientific processes and different applications of these words.
- Key vocabulary is used when answering exam style questions either in end of topic tests or final external examinations.

https://filestore.aqa.org.uk/resources/science/AQA-SCIENCE-GCSE-SUBJECT-VOCAB.PDF

Implementation

Key stage 3:
In Year 7, every student is introduced to a sequence of 'Super Safe Science' lessons for the first two weeks. Here they look at how to handle apparatus for various experiments, as well as the level of caution required. Some of the other topics that are taught in Year 7 include Cells (Biology), Mixing, Dissolving and Separating (Chemistry) and Forces and their Effects (Physics). At the end of each unit, there is a test or a graded assessment piece, so that students and parents know how much progress is being made. There is also an end of year test.

In Year 8, students look at units, such as Getting the Energy your Body Needs (Biology), Explaining Chemical Changes (Chemistry) and Magnetism and Electricity (Physics). As in Year 7, all topics covered will have an end of unit and an end of year test or a graded assessment piece. Students are assessed throughout the year, using peer and self-assessment and a set success criteria that is shared with the students in each lesson, based on taught content. Teachers will follow their long term planning to ensure the curriculum is well sequenced and students can build on their knowledge skills and understanding.

AQA Specification

Key stage 4:
In Year 9, all students start their GCSE preparation again, covering units in Biology, Chemistry and Physics. A majority of our students will complete the AQA Combined Science course. Top science students will be given the option to have additional lessons in one of the option blocks and complete the Triple Science AQA course of separate Biology, Chemistry and Physics GCSEs.

In Year 10 and Year 11, students continue their GCSE preparation; they will do all their linear examinations at the end of Year 11. There will, therefore, be a number of assessments and intervention programmes before they sit these exams.
Students are assessed throughout the year, using peer and self-assessment and a set success criteria that is shared with the students in each lesson, based on taught content. Teachers will follow their long term planning to ensure the specification is well sequenced and students can build on their knowledge and hone in their skills and understanding in a deep and rich way.

Key stage 5:
In Year 12 and Year 13 students may opt to study one or a combination of either Physics, Chemistry and/ or Biology A Level courses in preparation for their prospective university degree courses. These courses will be examined at the end of Year 13.
Students are assessed throughout the year, using peer and self-assessment and a set success criteria that is shared with the students in each lesson, based on taught content. Students take part in critique sessions that enable them to take advice from others to refine practice. Teachers will follow their long term planning to ensure the specification is well sequenced and students can build on their knowledge, skills and understanding, taking ownership of their work as it progresses in a deep and rich way.

Impact

Through the study of the sciences our students will demonstrate that they have made good progress from their starting points and become well rounded individuals. Work in students' books and in practical experiments show they can observe and explain the world around them. Discussions with students illustrate that they can explain and explore their own personal beliefs and feelings towards science. Through monitoring teacher's long term sequencing/planning and students' work it will be clear that student's knowledge, understanding of the sciences and their cultural capital have been considerably enhanced.

Students will see the relevance of science in their everyday life and build on their knowledge already acquired in the subject. Some students come to Chiltern Hills Academy already with a wealth of information and experiences in science. Here, they will have the opportunity to observe and participate in many exciting experiments. We also want students to develop the skills to explain and analyse what they are seeing in experiments and its relevance in a wider context. Students will know what it means to be a scientist and the career pathways that are available to them.

In Science we run many opportunities to enrich students' experiences, such as STEM events both within school as well as national events. These help students work collaboratively and problem solve. We run trips to the Science conferences in London, BIG BANG fairs locally and TEENTECH. We also like to work with the Royal Institute for Science conducting student and parent engagement sessions when allowed by central government.

CHILTERN HILLS ACADEMY

Create, Aspire and Excel
to 'Live life in all its fullness' (John 10:10)

*This table outlines the key topic areas covered in **Science** across KS3, KS4 and KS5. They are divided into the topics outlined below.*
A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, so students are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, students are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. Students are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Curriculum map- subject: Science

AGE-STAGE						
Year 7	Safety Mixing, Dissolving, Separating Magnets, Gravity, Floating	Cells Physical Changes	Energy and sound Cells-Reproduction	Elements, Compounds, Reactions	Eating, Drinking Magnetism, Electricity	Plants and Ecosystems Forces
Year 8	Chemical Changes Energy into the Body	Breathing Pressure Obtaining Useful Materials	Obtaining Useful Materials Variation for Survival	Motion on Earth and Space Using the Earth Sustainably	Waves and Light Plants and Ecosystems	Health and Effect of Drugs
GCSE Y9	B1 Cell Structure and Transport (12hrs) B2 Cell Division (4hrs) C1 Atomic Structure (8hrs) C2 The Periodic Table (5hrs) C3 Structure and Bonding (10hrs) P1 Energy and Energy Resources (9hrs)		B3 Organisation and the Digestive System (9hrs) B4 Organising Animals and Plants (9hrs) C5 Chemical Changes (9hrs) P2 Energy Transfer by Heating (4hrs) P3 Energy Resources (5hrs)		B5 Communicable Disease (7hrs) B6 Preventing and Treating Disease (4hrs) B7 Non-communicable Diseases (5hrs) C6 Electrolysis (5hrs) P4 Electrical Circuits (8hrs) P5 Electricity in the Home (5hrs)	
GCSE Y10	B8 Photosynthesis (4 hrs)		B12 Reproduction (7hrs)		B14 Genetics and Evolution (6hrs)	

	B9 Respiration (4 hrs) B10 The Nervous System (3hrs) B11 Hormonal Co-ordination (8hrs) C7 Energy Changes (5 hrs) C8 Rates and Equilibrium (10hrs) P6 Molecules and Matter (6hrs)	B13 Variation and Evolution (5hrs) P7 Radioactivity (5hrs) P8 Forces in Balance (6hrs) P9 Motion (4hrs)	C9 Crude Oil and Fuels (4hrs) C10 Chemical Analysis (4hrs) P10 Forces in Motion (6hrs) P11 Wave Properties (6hrs) MOCK EXAMS
GCSE Y11	B15 Adaptations, Interdependence and Competition (9hrs) B16 Organising an Ecosystem (3hrs) C11 The Earth's Atmosphere (5hrs) C12 The Earth's Resources (7hrs) C4 Chemical Calculations (4hrs) MOCK EXAMS	B17 Biodiversity and Ecosystems (6hrs) P12 The Electromagnetic Spectrum (6hrs) P13 Electromagnetism (3hrs) REVISION	REVISION and FINAL EXAMS
A-level Y12	Biological Molecules Nucleic Acids Cell Structure Transport across the Cell Membrane Atomic Structure Amount of Substance Bonding Alkanes Halogenoalkanes Electricity Mechanics and Materials	Cell Recognition and the Immune System Exchange DNA, Genes and Protein Synthesis Energetics Kinetics Equilibria Alkenes Alcohols Organic Analysis Particles and Radiation Mechanics and Materials	Mass Transport Genetic Diversity Biodiversity Populations in Ecosystems Response to Stimuli Oxidation,Reduction, Redox Periodicity Group 2 Alkaline Earth Metals Group 7 Halogens Thermodynamics Waves and Optics Motion in a Circle
A-level Y13	Photosynthesis Respiration Energy and Ecosystems Inherited Change Populations and Evolution Kinetics 2 Equilibrium Constant Electrode Potentials and Electrochemical Cells Nomenclature and Isomerism Carbonyl Compounds Aromatic Chemistry Amines Polymerisation Further Mechanics and Thermal Physics Nuclear Physics	Nervous Co-ordination and Muscles Homeostasis Gene Expression Recombinant DNA Technology Periodicity Transition Metals Reactions of Inorganic Compounds Amino Acids, Proteins and DNA Organic Synthesis and Analysis Structure Determination Chromatography Fields Optional unit	REVISION and FINAL EXAMS

KS3/4/5 National Curriculum coverage – Colour code for ease

Green	**Biology**
Pink	**Chemistry**
Blue	**Physics**