

Curriculum Intent Statement for Science

At Chase Terrace Academy we aspire for all of our students to achieve greater things than they ever thought possible.

We pride ourselves on being a warm and welcoming school that places community at the heart of everything we do. Our ambitious curriculum is enriching and inclusive, providing challenge and breadth for all. This empowers our students to become compassionate, confident and creative individuals who are resilient, respectful and equipped with a desire to take up a fulfilling role in society and the wider world.

Through the study of science we want to encourage our students to understand and value different cultures, countries and people as well as having an appreciation of how the world works and science in the media which can often be misinterpreted.

We aspire for our students to retain a sense of wonder about our vast and complex Universe. Future generations should be aware of how scientific and technological progress is changing the world, and to help the wider public understand it. It is important to ensure that these changes are heading in the right direction. In a democratic society, this means that everyone needs to have a basic understanding of science to make informed, responsible decisions about the future.

We put student-teacher relationships at the heart of what we do and therefore we start our lessons promptly and greet students at the door when they arrive and when they leave.

We provide the opportunity for those students with a particular passion for science to study single sciences. This gives students the scope to further broaden and deepen their scientific knowledge in preparation for study at A-level and beyond.

Curriculum Implementation Plan

Science Overall Big Picture			
	Term 1	Term 2	Term 3
Year 7	<ul style="list-style-type: none"> • Cells • Particles & the Particle Model of Matter • Energy 	<ul style="list-style-type: none"> • Reproduction • Separating Mixtures • Electricity & Magnetism 	<ul style="list-style-type: none"> • Ecosystems • Acids & Bases • Space & Waves • End of year exam
Year 8	<ul style="list-style-type: none"> • Nutrition & Digestion • Atoms, Elements (including Periodic Table) & Compounds • Forces 	<ul style="list-style-type: none"> • Respiration • Chemical Reactions • Light & Sound 	<ul style="list-style-type: none"> • Plants & Photosynthesis • Chemical Quantities • Pressure & Speed • End of year exam
Year 9	<ul style="list-style-type: none"> • Maths skills & science skills 1 • Cells • Atomic structure & Periodic Table • Particle model of matter 		<ul style="list-style-type: none"> • Maths skills & science skills 2 • Transport in cells • Energy changes • Atomic structure & radiation (physics) • Practical investigations
Year 10	Biology <ul style="list-style-type: none"> • Organisation • Infection & Response Chemistry <ul style="list-style-type: none"> • Structure & bonding • Quantitative chemistry Physics <ul style="list-style-type: none"> • Particle model of matter • Atomic structure & radiation 	Biology <ul style="list-style-type: none"> • Bioenergetics • Homeostasis Chemistry <ul style="list-style-type: none"> • Chemical changes Physics <ul style="list-style-type: none"> • Energy 	Biology <ul style="list-style-type: none"> • Homeostasis Chemistry <ul style="list-style-type: none"> • Energy changes • Rate & extent of chemical change 2 (equilibria) Physics <ul style="list-style-type: none"> • Forces 1
Year 11	Biology <ul style="list-style-type: none"> • Inheritance • Ecology Chemistry	Biology <ul style="list-style-type: none"> • Ecology • Revision Chemistry	Revision and exam preparation



	<ul style="list-style-type: none"> • Extent of chemical change • Organic • Analysis • Using resources Physics <ul style="list-style-type: none"> • Forces (part 2) • Waves • Electromagnetism • Static electricity (single only) • Space (single only) 	<ul style="list-style-type: none"> • Using resources • Atmosphere revision Physics <ul style="list-style-type: none"> • Electromagnetism • Space (single science only) • Maths skills & science terms • Revision and exam preparation after half term 	
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Curriculum Implementation Plan

Biology			
	Term 1	Term 2	Term 3
Year 7	<ul style="list-style-type: none"> • Intro into Science • Cells 	<ul style="list-style-type: none"> • Reproduction 	<ul style="list-style-type: none"> • Ecosystems
Year 8	<ul style="list-style-type: none"> • Nutrition & Digestion 	<ul style="list-style-type: none"> • Respiration 	<ul style="list-style-type: none"> • Plants & Photosynthesis
Year 9	<ul style="list-style-type: none"> • Maths skills & science skills 1 • Cells 	<ul style="list-style-type: none"> • Maths skills & science skills 2 • Transport in cells 	
Year 10	<ul style="list-style-type: none"> • Organisation • Infection & Response 	<ul style="list-style-type: none"> • Bioenergetics • Homeostasis 1 	<ul style="list-style-type: none"> • Homeostasis 2
Year 11	<ul style="list-style-type: none"> • Inheritance • Ecology 	<ul style="list-style-type: none"> • Ecology • Revision 	<ul style="list-style-type: none"> • Revision and exam preparation
Year 12	<ul style="list-style-type: none"> • Monomers and polymers • Carbohydrates • Lipids • Proteins and Enzymes • Nucleic acid • ATP, water and inorganic ions • Cell structure 	<ul style="list-style-type: none"> • Transport across cell membranes • Surface area: volume ratio • Gas exchange • Mass transport • Cell recognition and the immune system • DNA, gene and chromosomes 	<ul style="list-style-type: none"> • Mass transport • Species and taxonomy • Biodiversity within a community • Investigating diversity • Photosynthesis (A-Level)



	<ul style="list-style-type: none"> All cells arise from other cells Transport across cell membranes 	<ul style="list-style-type: none"> DNA and protein synthesis Genetic diversity and adaptations Species and taxonomy 	
Year 13	<ul style="list-style-type: none"> Energy in ecosystems Inheritance Populations and evolution Populations and ecosystems Photosynthesis and respiration Response to stimuli Nervous coordination and muscles 	<ul style="list-style-type: none"> Gene expression DNA technology Nervous coordination and muscles Skeletal muscle Homeostasis 	<ul style="list-style-type: none"> Examination preparation Essay writing

Biology Curriculum Implementation Plan

Biology				
Knowledge and Skills – Students will be taught to...	Reading, Oracy, Literacy and Numeracy	Formative Assessment	Summative Assessment	Link to GCSE Content
<p>Throughout their Biology journey students will learn to analyse patterns, draw conclusions, present data, read, understand and respond to information, justify opinions, collect data, plan variables, test hypotheses, estimate and minimise risks, examine consequences, review theories and interrogate sources of information.</p> <p>Intro into Science</p> <ul style="list-style-type: none"> Lab safety & hazards 	<p>Reading:</p> <ul style="list-style-type: none"> Regular use of on screen sources and science news articles in lessons. Research and online reading Science revision guides <p>Recommended reading:</p> <p>Frozen Planet – Alistair Fothergill</p>	<p>Questioning in lessons</p> <p>Whole class feedback during lessons</p> <p>Regular verbal feedback</p> <p>Peer and self-assessment of written work</p>	<p>4 end of unit assessments based on all previous work which continues to build on ideas from previous topics completed in the academic year to inform reports.</p> <p>At the end of each year students will sit an end</p>	<p>Most of the topics in year 7&8 are designed to maintain student’s natural curiosity, develop practical skills and also to provide solid foundations of the concepts they will meet at GCSE</p> <p>In year 9 students revisit and build upon some of the key</p>

<ul style="list-style-type: none"> • Microscopes & Bunsen burners • The scientific method <p>B1 - Cells & Organisation</p> <ul style="list-style-type: none"> • Structure & function of cells /using microscopes. • Movement of materials in & between cells • Unicellular organisms • Organisation of multicellular organisms • The human skeleton, muscles & biomechanics <p>B2 - Reproduction and genetics</p> <ul style="list-style-type: none"> • Reproduction in humans (gametes, fertilisation, gestation and birth) • Structure and function of the male and female reproductive systems • Menstrual cycle • Reproduction in plants, including flower structure • Heredity, DNA, genes • Variation <p>B3 - Ecosystems and Populations</p> <ul style="list-style-type: none"> • Interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • Importance of plant reproduction in food security 	<p>Horrible Science (collection of books) – Nick Arnold</p> <p>Longitude – Dava Sobel</p> <p>Nightwatch – Terence Dickinson</p> <p>Planet Earth – Alistair Fothergill</p> <p>The Planets – Dava Sobel</p> <p>Science: The Definitive Visual Guide – Adam Hart Davis (Dorling Kingsley)</p> <p>Wonders of the Universe - Brian Cox</p> <p>WOW: The Visual Encyclopaedia – Dorling Kingsley</p> <p>Oxygen – Nick Lane</p>	<p>Low stakes quizzing</p> <p>Exit strategies</p>	<p>of year exam covering all the key ideas from the current year and some topics from previous years</p>	<p>ideas in science (e.g. cells, particles and energy) to provide a solid foundation for the concepts they will meet in year 10 & 11 (e.g. cells, particles, chemical reactions, energy & forces).</p> <p>All set questions are GCSE style.</p> <p>Range of language based skills to prepare for GCSE.</p>
	<p>Numeracy:</p> <ul style="list-style-type: none"> • Standard form (not in yr7&8) this is introduced in year 9 to set a basis for GCSE ideas they meet in yr 10 & 11. • Graphing & scales • Averages • The idea of uncertainties is met in year that build on the ideas of averages met in Yr 7 & KS2 • Formula & balancing equations 			



<ul style="list-style-type: none">• Variation, adaptation and natural selection <p>B4 - Nutrition & digestion</p> <ul style="list-style-type: none">• What makes a healthy diet?• Calculations of energy requirements in a healthy daily diet• Consequences of imbalances in the diet, deficiency diseases• The human digestive system• Importance of bacteria in the digestive system• Effects of recreational drugs. <p>B5 - Respiration and fitness</p> <ul style="list-style-type: none">• Structure and functions of the gas exchange system in humans• Lungs and our breathing, measuring lung volume• Impact of exercise, asthma and smoking• Aerobic and anaerobic respiration <p>B6 - Plants and photosynthesis</p> <ul style="list-style-type: none">• Photosynthesis, equations and energy changes• How plants are adapted for photosynthesis• Role of leaf stomata in gas exchange <p>Maths & Science Skills 1</p> <ul style="list-style-type: none">• Averages & Uncertainties	<ul style="list-style-type: none">• Using and rearranging equations is briefly met in yr 8 and built upon in the following years <p>Literacy & Oracy:</p> <ul style="list-style-type: none">• Encourage group discussion and debate.• Communicate ideas clearly & effectively.• Make sure spelling and punctuation is accurate			
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<ul style="list-style-type: none">• Significant figures & precision• Standard form• Units & conversions• Ratios & percentages• HSW terms• ISA investigation 1 <p>Cells</p> <ul style="list-style-type: none">• Eukaryotes & prokaryotes• Microscopes• Measuring cells• Culturing microbes• Stem cells• Mitosis and the cell cycle• Diffusion <p>Maths & Science Skills 2</p> <ul style="list-style-type: none">• Averages & frequency• Writing methods• Graph skills• Data analysis• Rearranging formulae• Further HSW terms• ISA investigation 2 <p>Transport in cells</p> <ul style="list-style-type: none">• Diffusion• Osmosis• Active transport• Plant tissues• Plant transport systems				
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<p>Organisation</p> <ul style="list-style-type: none">• Principles of organisation• The properties of enzymes• Human digestive system and enzymes• Food Tests• Heart and blood vessels• CHD• Health and non-communicable diseases• Cancer <p>Infection & Response</p> <ul style="list-style-type: none">• Communicable diseases• Viral diseases• Malaria• Human defence systems• Vaccination• Treating disease and antibiotics• New drugs• Culturing microorganisms and preventing bacterial growth (Bio only)• Plant diseases (Bio only)• Detection and identification of plant deficiencies (Bio only)• Uses of monoclonal antibodies (Bio only) <p>Bioenergetics</p> <ul style="list-style-type: none">• Photosynthesis• Respiration• Metabolism				
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<p>Homeostasis & Response</p> <ul style="list-style-type: none">• Human nervous system• Endocrine system• Blood glucose• Menstrual cycle• Contraception• Treating infertility• Negative feedback• The brain (Bio only)• The eye (Bio only)• Water and nitrogen balance (Bio only)• Kidney function and kidney failure (Bio only)• Plant hormones (Bio only) <p>Inheritance, Variation & Evolution</p> <ul style="list-style-type: none">• Reproduction• Meiosis• DNA structure and Mendel (Bio only)• Genetic inheritance• Inherited disorders• Sex determination• Variation and evolution• The development of understanding of genetics and evolution• Cloning (Bio only)• Theories of evolution (Bio only)• Speciation (Bio only) <p>Ecology</p> <ul style="list-style-type: none">• Classification of living organisms• Communities				
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<ul style="list-style-type: none">• Abiotic & Biotic factors• Adaptations• Levels of organisation• Trophic levels and pyramids of biomass (Bio only)• How materials are cycled• Decomposition (Bio only)• Biodiversity• Waste management• Land use• Deforestation• Global warming• Maintaining biodiversity• Factors affecting food security (Bio only)• Farming techniques (Bio only)• Sustainable fisheries (Bio only)• Role of biotechnologies (Bio only)				
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