

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.

In 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 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 is designed to be ambitious & meet the needs' 'Develops skills for future learning & employment'

Outcomes: For competitive statistics and outcomes in-line and beyond National averages for KS4 courses – particularly Grade 7 & beyond. Destination figures which show student's passion for the subject.

Students to have a 'deeper' knowledge: teaching is designed to help students to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts. Students confident to debate and discuss their knowledge of topics and respond to feedback in a way that is progressive.



Curriculum, implementation - How and what we do

Schemes of learning

- Revised curriculum at KS3 mastery and deeper learning embedded into lessons including key command words working across the JTMAT.
- Literacy and numeracy activities incorporated into lessons and all schemes of learning as well as within our assessments particularly graphs and data.
- Science in the news built is incorporated into lessons as and when.
- Curriculum at KS4 is appropriate and engaging to students. Content is relevant to all learners and diverse.
- Transition unit completed in Year 9 to help prepare students for the KS4 course.
- Revision is woven into SOW to ensure content is retained in the long-term.
- Assessments are reviewed and amended where necessary to support outcomes and to ensure the 'deeper learning' approach.
- Knowledge organisers are updated every year in line with latest assessments and feedback from exam boards and examiners

Quality of marking and feedback

- Clear expectations and routines for student response to feedback (E.g. purple pens and QLA)
- Standardisation activities for mock assessments and book trawls carried out on a termly basis.
- Informal learning walks.
- Use of open-door policy.

Extra-curricular and intervention

- Quality first teaching to ensure gap is narrowed.
- Year 11 intervention held after school in line with the intervention programme.
- Year 10 intervention held afterschool in line towards the end of Y10 when capacity allows.



Science Curriculum Implementation Plan

Science Overall Big Picture					
	Term 1	Term 2	Term 3		
Year 7		 Genes 1 – Variation ↓ 	 JTMAT End of Year Exam ↓ 		
	 Organisms 1 – Movement & Cells ↓ 	 Matter 1 – Separating Mixtures ↓ 	 Genes 1 – Plant Reproduction ↓ 		
	 Matter 1 – Particle Model ↓ 	 Energy 1 – Energy Costs & Transfer ↓ 	 Reactions 1 – Acids & Bases ↓ 		
	 Forces 1 – Speed & Gravity ↓ 	 Assess / DIRT / RETEACH → 	• Earth 1 – Earth Structure & Universe		
	• Assess / DIRT / RETEACH →				
Year 8	 Atoms, elements, compounds ↓ 	 Chemical reactions ↓ 	 Chemical quantities ↓ 		
	 Electricity & Magnetism ↓ 	 Light & Sound ↓ 	 Pressure & speed ↓ 		
	 Nutrition & digestion ↓ 	 Respiration ↓ 	 Plants & photosynthesis ↓ 		
	● Assess / DIRT / RETEACH →	 Assess / DIRT / RETEACH → 	 Assess / DIRT / RETEACH → 		
Year 9	 Applied science skills ↓ 	 Cells (continued) ↓ 	 Energy changes (continued) ↓ 		
	Energy ↓	 Atomic structure & radiation ↓ 	 Transport in cells ↓ 		
	 Atomic structure & Periodic Table ↓ 	 Energy changes / formula / equations 	 Assess / DIRT / RETEACH ↓ 		
	• Cells ↓	• Transport in cells (10)	Applied science skills 2 (6)		
	Assess / DIRT / RETEACH				
Year 10	Biology – Organisation → Infection & Re	esponse \rightarrow Bioenergetics \rightarrow Review of Cells \rightarrow	Homeostasis		



	• Chemistry – Review of atomic structure → Structure & bonding → Quantitative chemistry → Chemical changes → Energy
	changes review -> Rates of reaction
	 Physics – Electricity → Particle model of matter → Review of atomic structure & radiation → Forces (part 1)
	Required practical revision if needed
	 Biology – Homeostasis review → Inheritance → Ecology → Review → Exams
Year 11	
	• Chemistry – Rates review + equilibria → Organic → Chemical analysis → Earth's atmosphere → Using resources → Review →
	Exams
	 Physics – Forces → Waves → Electromagnetism → Static electricity → Space (single only) → Review → Exams
Year 12	<u>Biology</u>
	 Biological molecules → Cells → Organisms exchange substances with their environment → Genetic information, variation and
	relationships between organisms $ ightarrow$ Energy transfers in and between organisms (photosynthesis only)
	Ch and interest
	<u>Cnemistry</u>
	 Physical – Atomic structure – Amount of substance – Bonding – Energetics – Kinetics – Equilibria Fauilibria
	$= \text{Inorganic} - \text{Periodicity} \rightarrow \text{Group } 2 \rightarrow \text{Group } 7$
	Morganic – Periodicity – Group 2 – Group 7
	• Organic – Nomenciature – isomensin – Aikanes – Halogenoaikanes – Aikenes – Aikonois – Organic analysis
	Physics
	 Measurements and their errors → Particles and radiation → Mechanics and materials
	 Waves → Electricity
Year 13	Biology
	• Energy transfers in and between organisms (respiration only and energy in ecosystems only) → Organisms respond to changes
	in their internal and external environment $ ightarrow$ Genetics, populations, evolution and ecosystems $ ightarrow$ The control of gene
	expression → Essay writing → Revision & Exams



 Chemistry Physical – Thermodynamics → Rate equations → Equilibrium constants → Electrode potentials → Acids & Bases → Revision & Exams Inorganic – Properties of period 3 → Transition metals → Reaction of ions in aqueous solution → Revision & Exams Organic – Optical isomerism → Aldehydes & ketones → Acids & their derivatives → Aromatic chemistry → Amines → Polymers → Amino acids, proteins & DNA → Organic synthesis → Nuclear magnetic resonance → Chromatography → Revision & Exams
 Physics Further mechanics → Thermal physics → Nuclear physics → Revision & Exams Fields and their consequences → Medical physics → Revision & Exams

Chemistry Implementation Plan

	CHEMISTRY					
	Term 1	Term 2		Term 3		
Year 7	Lab Safety	Matter 1 – Separente	rating Mixtures	 Reactions 1 – Acids & Bases 		
	 Matter 1 – Particle Model 					
Year 8	Atoms, Elements & Compounds	Chemical Reaction	ons	Chemical Quantities		
	Applied science skills 1		Energy changes			
Year 9	Atomic structure & Periodic Table		Applied science sk	ills 2		
Year 10	Structure & bonding	Chemical change	es	 Energy changes revisit 		
	Quantitative chemistry			Rate & extent of chemical change		
Year 11	Organic chemistry	Atmosphere rev	ision	Revision & exam preparation		
	Chemical analysis	Using resources				
	Earth & its atmosphere					
Year 12	Atomic structure	Organic – alkene	25	Analysis, Mass spec & IR		
	Amount of substance	Halogenoalkane	S	Optical isomerism		
	Bonding	Alcohols		Aldehydes & ketones		
	Kinetics	Equilibria		Revision & exam preparation		



	Intro into organic & Alkanes	Redox	Thermodynamics (A2)
	• Energetics	• Group 2	
		• Group /	
		Periodicity	
Year 13	Carboxylic Acids & Esters	Polymers	Revision & exam preparation
	Aromatic Chemistry	Amino Acids, Proteins & DNA	
	Amines	Organic synthesis	
	• NMR	Chromatography	
	Acids & Bases	Transition metals	
	 Electrode potentials 	Reactions of ions in aqueous solutions	
		 Properties of period 3 elements and 	
		their oxides	

Chemistry Curriculum Implementation Plan

Chemistry					
Knowledge and Skills – Students will be taught	Reading, Oracy, Literacy and	Formative Assessment	Summative Assessment	Link to GCSE Content	
to	Numeracy				
Throughout their Chemistry journey students	Reading:	Questioning in lessons	4 end of unit	Most of the topics in year	
will learn to analyse patterns, draw	 Regular use of on screen 		assessments based on	7&8 are designed to	
conclusions, present data, read, understand	sources and science news	Whole class feedback	all previous work which	maintain student's natural	
and respond to information, justify opinions,	articles in lessons.	during lessons	continues to build on	curiosity, develop practical	
collect data, plan variables, test hypotheses,	 Research and online 		ideas from previous	skills and also to provide	
estimate and minimise risks, examine	reading	Regular verbal	topics completed in the	solid foundations of the	
consequences, review theories and	 Science revision guides 	feedback	academic year to inform	concepts they will meet at	
interrogate sources of information.			reports.	GCSE.	
	Recommended reading:	Peer and self-			
Intro into Science	Frozen Planet – Alistair	assessment of written	At the end of each year	In year 9 students revisit and	
 Lab safety & hazards 	Fothergill	work	students will sit an end	build upon some of the key	
Microscopes & Bunsen burners	Horrible Science (collection		of year exam covering	ideas in science (e.g. cells,	



The sector of the sector of	of books) Nich America			
Ine scientific method	of books) – Nick Arnold	LOW STAKES QUIZZING	all the key ideas from	particles and energy) to
	Longitude – Dava Sobel		the current year and	provide a solid foundation
C1 - Particles	Nightwatch – Terence	Exit strategies	some topics from	for the concepts they will
 Properties of solids, liquids and gases 	Dickinson		previous years	meet in year 10 & 11 (e.g.
The particle model	Planet Earth – Alistair			cells, particles, chemical
 Density, expansion, diffusion, change of 	Fothergill			reactions, energy & forces).
state	The Planets – Dava Sobel			All set questions are GCSE
C2. Comparating Minterna	Science: The Definitive			style
C2 - Separating Wixtures	Visual Guide – Adam Hart			Style.
Soluble and insoluble substances	Davis (Dorling Kingsley)			Range of language based
Filtration	Wonders of the Universe -			skills to prepare for GCSE
Distillation	Brian Cox			
Chromatography	WOW: The Visual			
C2 Acids and Bases	Encyclopaedia – Dorling			
• Testing acids and alkalis	Kingsley			
Aling indicators	Oxygen – Nick Lane			
The pH Scale and neutralisation	Numeracy:			
• The ph scale and neutralisation	Writing chemical formula.			
B4 - Nutrition & digestion	 Standard form (not in 			
 What makes a healthy diet? 	vr7&8) this is introduced			
 Calculations of energy requirements in a 	in year 9 to set a basis for			
bealthy daily diet	GCSE ideas they meet in			
 Consequences of imbalances in the diet 	yr 10 & 11.			
deficiency diseases	 Graphing & scales 			
The human digestive system	Averages			
 Importance of bacteria in the digestive 	• The idea of uncertainties			
system	is met in year that build			
Effects of recreational drugs	on the ideas of averages			
	met in Yr 7 & KS2			
C4 - Atoms, Elements and Compounds	Formula & balancing			
	equations			



Elements & The Periodic Table	 Using and rearranging 		
 Compounds and chemical reactions 	equations is briefly met in		
Atoms and molecules	yr 8 and built upon in the		
	following years		
P4 - Matter	Literacy & Oracy:		
Density	 Encourage group 		
 Physical changes of state 	discussion and debate.		
Brownian motion	Communicate ideas clearly		
 Internal energy and temperature 	& effectively.		
B5 - Respiration and fitness	 Make sure spelling and 		
• Structure and functions of the gas	punctuation is accurate		
exchange system in humans			
• Lungs and our breathing, measuring lung			
volume			
• Impact of exercise, asthma and smoking			
Aerobic and anaerobic respiration			
C5 - Chemical Reactions			
Chemical and physical changes			
 Reactions of acids and metals 			
Gas tests			
Atoms and molecules			
P3 - Space & Waves			
 Sound waves and hearing 			
 Seasons , day & night 			
Phases of the moon			
Planets			
Solar System and ET			
Crater investigation			
B6 - Plants and photosynthesis			
 Photosynthesis, equations and energy 			
changes			
• How plants are adapted for photosynthesis			



Role of leaf stomata in gas exchange		
C6 - Further Chemical Reactions		
Combustion		
Oxidation and reduction		
Beactions of metals and the reactivity		
series		
Displacement		
P6 - Forces Pressure & Moments		
Types of force		
Balanced and unbalanced forces		
Balanced and unbalanced forces Prossure and moments		
• Pressure and moments		
Applied Science Skills 1		
Applied Science Skills 1		
 Averages Writing mathads 		
Writing methods		
Graph skills		
Data analysis		
Conclusions & evaluations		
Atomic Structure & Poriodic Table		
Atomic Structure & Periodic Table		
 Models of the atom (plum pudding & pucloar) 		
• Structure of stom		
Structure of atom Electron arrangement		
Mondology		
Medern Periodic Table		
Groups 1.7.0		
Groups 1,7,0		
Industion metals		
Applied Science Skills2		
Averages		
Writing methods		



Graph skills		
Data analysis		
Conclusions & evaluations		
Energy Changes		
Exothermic & endothermic reactions		
Reaction profile diagrams		
Energy changes in reactions (Bond		
breaking & making)		
Fuel cells & batteries		
Structure & Bonding		
Ionic bonding		
Covalent bonding		
Metallic bonding & their properties		
Simple & giant molecules (including		
fullerenes 7 graphene)		
Quantitative Chemistry		
Conservation of mass		
Relative formula mass (Mr)		
The Mole		
Limiting reactants		
Reacting quantities		
Concentrations & solutions		
Chemical Changes		
Reactions of metals		
Displacement reactions		
Reactivity series		
Oxidation & reduction		
Half equations		



Acids, Bases & Salts		
Making salts		
Electrolysis		
Rate & Extent of Chemical Change		
Defining & measuring rate of reaction		
Factors affecting rate of reaction		
Collision theory and explaining factors		
affecting rate		
Reversible reactions		
Dynamic equilibria		
Organic Chemistry		
Crude Oil & Fractional distillation		
Alkanes		
Types of Combustion		
Cracking & Alkenes		
Alkenes, Alcohols, Carboxylic acids, Esters		
and Polymers (single chemistry only)		
Chemical Analysis		
Pure & impure substances		
Chromatography		
Testing for gases		
• Flame tests, testing for cations using NaOH		
(single chemistry only)		
Testing for anions (single chemistry only)		
 Instrumental analysis (single chemistry 		
only)		
Earth & The Atmosphere		
Early atmosphere		



Modern atmosphere		
Combustion & Greenhouse effect		
Climate change		
Atmospheric pollutants		
Using Resources		
Sustainable development		
Renewable & non-renewable resources		
Obtaining potable water		
Purifying water		
Extracting copper and alloys		
Life Cycle assessment		
Reusing, reducing & recycling		
Single chemistry only		
Corrosion		
Ceramics, Composites & Polymers		
Fertilisers & Haber Process		