

Medium Term Planning Document: Combined science Year 11

Curriculum Intent:

The Northampton Academy science curriculum is designed to let all students thrive and develop a love for science. When students reach KS4 they will have a strong foundation of understanding and appreciation of the scientific world and will continually work on their competence in all aspects of science, building a better understanding of how the world around us works and our place within it.

In Science at KS4 pupils should be able to develop the independence, resilience and character traits required to prepare them to be able to critically analyse information and apply these traits to their everyday lives. In Science the skill of processing information and data can be used in problem solving, planning, and strategising when required. Students will also be exposed to careers and learn about the types of careers that would use the knowledge they will learn about in each of their topics.

'Why This, Why Now?'

In our planning, we have asked ourselves 'why this, why now?' Here we provide some examples of the curriculum choices we have made, and why the units have been placed in the order we have chosen:

- DNA, genes and inheritance is taught before evolution as a basic understanding of how characteristics are passed on is needed in order to more fully grasp the concepts of natural selection and why species evolve.
- Rates of reaction is taught before Organic Chemistry; this way pupils have a better understanding of why a catalyst must be used when cracking alkanes.

Curriculum Intent Science



*We aim to **stoke your curiosity** and **better your understanding** about the world around you.*

You will have the opportunity to:

- **Gain investigative skills**, allowing you to question and inquire.
- **Expand your scientific knowledge** about the world you live in.
- **Improve and develop existing numeracy, literacy and problem solving skills**



Medium Term Planning Document: Combined science Year 11

The Medium Term Planning document below is designed to show the journey that every student takes through our curriculum. Some elements of the curriculum may be taught over several lessons, others in a single lesson.

Science				
Topic	Content	Key words	Formative Assessments?	
C6 – The Rate and Extent of Chemical Change	Rates of reaction	Activation energy Collision theory Temperature Surface area Concentration Pressure Equilibrium Dynamic Equilibrium	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Chemistry Click 'The rate and extent of chemical change'
	Collision Theory			
	Factors affecting rates of reaction			
	Reversible Reactions			
	The Effect of Changing Conditions on Equilibrium (HT)			
	Le Chatelier's Principle uses in industry (HT)			
B5 - Homeostasis	The Nervous System	Neurone Synapse Synaptic Gap Endocrine Gland Target Organ Hormone Pituitary gland Adrenalin Thyroxin Luteinising hormone Follicle Stimulating hormone Testosterone Oestrogen Progesterone	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Biology Click 'Homeostasis'
	Hormonal Responses			
	Blood Sugar and Diabetes			
	Menstrual Cycle			
	Fertility (HT)			
	Contraception			
C7 – Organic Chemistry	Crude Oil	Alkane Hydrocarbon Distillation Evaporate		
	Fractional Distillation			
	Cracking and Uses of Hydrocarbons			

Medium Term Planning Document: Combined science Year 11

		Condensation Polymer		
--	--	-------------------------	--	--



Medium Term Planning Document: Combined science Year 11

Science				
Topic	Content	Key words	Formative Assessments?	
P5 - Forces	Forces	Newton Weight Mass Spring constant Momentum Reaction time Factors	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Physics Click 'Forces'
	Weight, Mass and Gravity			
	Forces and Work			
	Elasticity			
	Velocity and Acceleration			
	Newtons Laws of Motion			
	Stopping Distance			
	Momentum (HT)			
B6 - Inheritance	Reproduction	Meiosis Fertilisation Chromosomes DNA Nucleotide Gametes Genotype Phenotype Homozygous Heterozygous Kingdom Domain Species Genus Competition Gene	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Biology Click 'Inheritance, variation and evolution'
	Genetic Inheritance			
	Genetic disorders			
	Natural Selection and Evolution			
	Selective Breeding and Genetic engineering			
	Classification			
C8 – Chemical Analysis	Pure and Impure substances	Formulation Pure Impure	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette	https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Chemistry Click 'Chemical Analysis
	Chromatography			
	Gas tests			

Medium Term Planning Document: Combined science Year 11

		Mobile Phase Stationary Phase Precipitate	Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	
--	--	---	--	--

Medium Term Planning Document: Combined science Year 11

Summative Assessment:

Pupil Mid-Year Assessments will take place towards the end of half term 2. These will cover all content taught in Year 10 (All of the Paper 1 content). This assessment will inform Rank Order and will therefore inform group moves once this data is published to students and parents.

Science	Year 11 – Half Term 3			
Topic	Content	Key words		Link(s) to an example lesson
P6 - Waves	Wave properties	Wave speed		https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Physics Click 'Waves'
	Measuring Waves	Wavelength		
	Refraction	Frequency		
	Electromagnetic Spectrum	Amplitude Period Ionisation		
C9 – Atmosphere	The Earth's Atmosphere	Greenhouse gas		https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Chemistry Click 'Chemistry of the atmosphere'
	The Greenhouse Effect	Climate Change		
	Climate Change	Acid rain		
	Pollutants	Erosion Melting		
P7 - Magnetism				https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Physics Click 'Magnetism'
C10 – Using Resources				https://continuityoak.org.uk/lessons Click 'KS4 Science' Under Chemistry Click 'Using Resources'

Medium Term Planning Document: Combined science Year 11



Science	Year 11 – Half Term 4 onwards		
Topic	Content	Formative Assessments?	Link(s) to an example lesson
All content	Individually tailored revision by group	Prior knowledge checks Bell work- retrieval quizzes/retrieval roulette Exam question plenaries (low stakes application) End of topic 'Pause Point' assessment.	https://continuityoak.org.uk/lessons Click 'KS4 Science'

Extra Support	SEND Adaptations
We primarily address the needs of our students by continually improving our teaching and ensuring high quality lessons. To ensure all students, regardless of SEND needs or ability can access the content, we also embed the following measures in our lessons -->	<ul style="list-style-type: none"> • Instructions kept short and clear • Use of a 'slow practical' approach • Use of visual practical sheets • Planning lessons with a common predictable structure (Do now, I, We You, etc) • Use clear timings for task completion where appropriate • Using scaffolds for calculations (VESRAU) • Lots of key term repetition to aid with retention • Model answers/scaffolding for written work • Coloured resources for students with visual stress