Department	SCIENCE (Combined Science)
Key Stage	KEY STAGE 4
Course Level	GCSE
Exam Board	AQA

Dates Delivered	Unit Title	End Points	Substantive Knowledge What will they learn about in this topic?	Disciplinary Knowledge What subject concepts will be developed through this topic?	Assessment Method	Key Course Guides & Reading

Year 10 Autumn term	Chemistry - Chemical Changes Physics - Atomic structure Physics - Particle model and pressure Physics - Forces Biology - Bioenergetics	Students will be able to describe the patterns that different chemical reactions follow. Students will be able to identify sub-atomic particles and state their properties. Students will be able to analyse the uses of radiation, the dangers associated with it. Students will be able to model nuclear decay using dice or a graph. Students will be able to discuss how changes in temperature affect the way particles move. Students will be able to investigate how photosynthesis is affected by the conditions of the environment.	Reactivity of metals, The reactivity series, Extraction of metals, oxidation and reduction, reactions of acids, soluble salts, the pH scale, Electrolysis. Atoms and isotopes, developing the model of the atom, nuclear radiation, radioactive decay and half-lives. Changes of state, density, internal energy, specific heat capacity, latent heat, particle motion in gases. Forces and their interactions, work done and energy transfer, forces and elasticity, speed, velocity and acceleration, Newton's laws of motion, momentum. Photosynthesis and respiration.	Predicting the outcome of different chemical reactions. Describing the products of electrolysis. Graph and data analysis. Description of scientific concepts i.e. developing a theory and testing using experiments. Application of scientific laws to real world examples.	End of topic tests at the end of topic (identified in substantive knowledge) Assessed in year 10 end of year assessments	Specification for combined science: https://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF

Dates Delivered	**Unit Title**	**End Points**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Assessment Method**	**Key Course Guides &**

			What will they learn about in this topic?	What subject concepts will be developed through this topic?		Reading
Year 10 Spring term	Biology - Homeostasis and response Biology - Inheritance, variation and evolution Chemistry - The rate and extent of chemical change Chemistry - Organic chemistry Physics - Waves Physics - Magnetism and electromagnetism	Students will be able to discuss how messages are sent around the body. Students will be able to compare the types of diabetes with reference to their causes and treatments. Students will be able to analyse how fossils are formed and how organisms are classified according to their genome. Students will be able to describe the processes of fractional distillation and cracking and discuss why these are done. Students will be able to label the properties of transverse waves and calculate the frequency and period.	The human nervous system, the endocrine system, blood glucose control and diabetes, contraception and infertility. Reproduction, meiosis, DNA and the genome, inheritance, variation, evolution, selective breeding, genetic engineering, fossils, extinction and classification. Calculating rates of reaction and the factors that affect this, collision theory, catalysts, reversable reactions and dynamic equilibrium. Carbon compounds as fuels and feedstock, fractional distillation, hydrocarbons, cracking and alkanes. Properties of waves, electromagnetic waves. Poles of a magnet, magnetic fields, the motor effect, electromagnetism.	Analysis of key biological concepts with real world examples such as diabetes. Descriptions of how selective breeding and genetic engineering affects their own lives in respect to food availability. Calculations using chemical moles or mass. Descriptions of industry processes in the use of crude oil. Ability to model a scientific process such as nuclear decay in an relatable scenario. Safe laboratory skills for required practical's.	End of topic tests at the end of topic (identified in substantive knowledge) Assessed in year 10 end of year assessments	Specification for combined science: https://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF

Dates Delivered	Unit Title	End Points	Substantive Knowledge	Disciplinary Knowledge	Assessment Method	Key Course Guides & Reading

			What will they learn about in this topic?	**What subject concepts will be developed through this topic?**		
Year 10 Summer term	Biology - Ecology Chemistry - Chemical analysis Chemistry - Chemistry of the atmosphere Chemistry - Using resources	Students will be able to discuss the adaptations of example organisms and how this helps the species survive. Students will be able to discuss the carbon and water cycles. Students will be able to separate mixtures in a practical setting. Students will be able to discuss how the atmosphere has changed and the reasons for this. Students will be able to complete a life cycle assessment of an unfamiliar object using data given to them. Students will be able to describe how to obtain potable water.	Adaptations, interdependence and competition, organisation of an ecosystem, cycling of nutrients, biodiversity and effects of human interaction. Purity, formulations and chromatography, identifications of common gases. Composition and evolution of the Earth's atmosphere, greenhouse gases and climate change, atmospheric pollutants. Finite and renewable resources, potable water, waste water treatment, alternative methods of extracting metals, life cycle assessments.	Descriptions of how cycles of nutrients allow communities of organisms to live. Understanding of laboratory skills that are used in industry. Evaluation of how climate change is occurring based on data given to them. Graph and table skills when analysing climate change data. Discussion of how pollutants can affect the daily life and health of humans. Water insecurity and how water can be filtered and sterilised to produce potable water. Laboratory skills when performing chromatography required practical.	End of topic tests at the end of topic (identified in substantive knowledge) Assessed in year 10 end of year assessments	Specification for combined science: https://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF