

YEAR 7	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	<p><u>Composite 1: Understand the Safety and Skills required for working Practically in Science:</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how to stay safe in science Understand the use for different types of lab equipment Understand how to use a Bunsen burner Understand how to read scales and take measurements <p>Component 2:</p> <ul style="list-style-type: none"> Understand when results are accurate or precise Understand how to identify and control risks in a lab Understand how variables are used in scientific investigations Understand how to present data in bar graphs and line graphs <p>Component 3:</p> <ul style="list-style-type: none"> Understand how to plan an investigation <p><u>Composite 2: Explore Chemical Reactions and Particle Rearrangements</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand atoms and elements Explore what compounds are and how they are formed Understand chemical formulas and equations <p>Component 2:</p> <ul style="list-style-type: none"> Understand what a mixture is Explore the properties of a compound compared to the elements in it Understand what physical and chemical changes are <p>Component 3:</p> <ul style="list-style-type: none"> Understand what combustion is Understand the reactivity of metals Understand how group 1 metals react with oxygen <p>Component 4:</p> <ul style="list-style-type: none"> Understand how metals react with water 	<p><u>Composite: Use the Particle Theory of Matter to explore Solutions, Chemical changes and the Rates of Chemical Reactions</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand the properties of solid, liquids and gases State ways matter can change Understand what makes objects more dense than others <p>Component 2:</p> <ul style="list-style-type: none"> Use the particle theory of matter Understand why some substances are soluble Explore a factor that can affect the rate of solubility <p>Component 3:</p> <ul style="list-style-type: none"> Understand the concentration of solutions Explore what the pH scale shows Understand how to identify acidic and alkaline solutions <p>Component 4:</p> <ul style="list-style-type: none"> Explore the uses of acids Explore the uses of alkalis Explore neutralisation reactions <p>Component 5:</p> <ul style="list-style-type: none"> Explore which antacid tablet is the most effective at neutralizing acid Understand why some reactions are reversible Consolidate learning in the unit <p>Component 6:</p> <ul style="list-style-type: none"> Understand what is meant by the collision theory Explore how changes in temperature can affect reaction rate Explore how changes in concentration can affect reaction rate <p>Component 7:</p> <ul style="list-style-type: none"> Explore how changes in surface area can affect reaction rate Explore how changes in pressure can affect reaction rate Understand the effect of using a catalyst on reaction rate Calculate rates of reaction <p><u>Composite 2: Know the body basics for Sex education</u></p>	<p><u>Composite: Understand how Energy is stored and how it is transferred</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how energy is stored Explore the difference between heat and temperature Understand how to present changes in energy stores <p>Component 2:</p> <ul style="list-style-type: none"> Understand how to calculate efficiency Understand what a gravitational potential energy store is Understand what kinetic energy stores are <p>Component 3:</p> <ul style="list-style-type: none"> Understand what elastic potential energy is Understand what work done is Understand how to calculate Power using different equations <p>Component 4:</p> <ul style="list-style-type: none"> Explore ways of reducing unwanted energy transfers Understand how energy transfers by conduction Understand how energy transfers by convection <p>Component 5:</p> <ul style="list-style-type: none"> Understand how energy transfers by radiation Understand how non-renewable energy is used to generate electricity Understand how energy can be generated from renewable resources <p>Component 6:</p> <ul style="list-style-type: none"> Understand how to perform calculations using significant figures Understand how to handle data 	<p><u>Composite: Understand the Fundamentals of Force and Motion</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand what scalar and vector quantities are Understand the difference between contact and non-contact forces Explore the difference between mass and weight <p>Component 2:</p> <ul style="list-style-type: none"> Explore what happens to motion when forces are balanced Understand how levers affect moments Understand how pressure acts in a fluid <p>Component 3:</p> <ul style="list-style-type: none"> Understand how to calculate speed Understand how to calculate average speed from a distance-time graph Understand how to calculate acceleration using velocity <p>Component 4:</p> <ul style="list-style-type: none"> Understand how to calculate acceleration from velocity-time graphs Understand how and when objects reach terminal velocity Understand how mass and acceleration can affect force <p>Component 5:</p> <ul style="list-style-type: none"> Understand Newton's third law Understand what factors can affect the stopping distance of a car Explore car safety features 	<p><u>Composite: Understand the structure and function of living organisms</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how the body is organised Understand how microscopy techniques have developed over time Explore the structure of animal cells <p>Component 2:</p> <ul style="list-style-type: none"> Explore the structure of plant cells Explore prokaryotic cells Explore how some cells are specialised to carry out a particular function <p>Component 3:</p> <ul style="list-style-type: none"> Understand the process of diffusion Understand the process of osmosis Explore how water is lost from the leaves of a plant <p>Component 4:</p> <ul style="list-style-type: none"> Understand the process of photosynthesis Explore how the rate of photosynthesis can be affected Understand the structure of the leaf <p>Component 5:</p> <ul style="list-style-type: none"> Explore how the human digestive system works Understand the role of enzymes on digestion Explore the factors that affect the rate of enzyme activity <p>Component 6:</p> <ul style="list-style-type: none"> Explore how digestion is made efficient in the body Understand the process of aerobic respiration in the body Understand the process of anaerobic respiration Explore what metabolism is 	<p><u>Composite: Understand how species are interdependent and Interact within an Environment</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Explore the importance of ecosystems Explore how changing abiotic factors can affect an ecosystem Understand how to construct food chains <p>Component 2:</p> <ul style="list-style-type: none"> Explore organism relationships from food webs Explore the relationship between predator and prey populations Explore what pyramids for food chains can represent <p>Component 3:</p> <ul style="list-style-type: none"> Explore how animals compete for resources Explore how animals are adapted to survive Explore how plants are adapted to survive <p>Component 4:</p> <ul style="list-style-type: none"> Explore different conservation methods Understand how carbon is recycled Understand how to measure population size in a habitat <p>Component 5:</p> <ul style="list-style-type: none"> Understand how indicator species are used to determine pollution levels

	<ul style="list-style-type: none"> Understand how to test for hydrogen gas Understand how to test for carbon dioxide Component 5: <ul style="list-style-type: none"> Understand how substances can be displaced during reactions Consolidate unit of learning to transfer understanding to new contexts 	Component 1: <ul style="list-style-type: none"> Understand the process of Puberty State the changes that occur during Puberty Understand how hormones control the menstrual cycle Explore the different forms of contraception that are available Component 2: <ul style="list-style-type: none"> Understand how infertility treatments are used Understand the process of sexual intercourse 				
Prior knowledge and skills (from previous year / key stage)	<p>Students should recognise how to control variables where necessary</p> <p>Students should be able to record results</p> <p>Students should be able to take measurements</p> <p>Students can identify that some changes cannot be reversed if a new material is made</p>	<p>-students know that some materials dissolve to form solutions</p> <p>-students can identify solids, liquids and gasses and suggest how to separate mixtures based on filtering, sieving and evaporating</p>	<p>-Students should recognise that frictional forces cause heat energy</p>	<p>-students can identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>-students recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>-students understand that objects fall towards Earth because of the force of gravity</p>	<p>-Students can identify characteristics in plants, animals and microorganisms</p> <p>-students can identify the main parts of the human circulatory system</p>	<p>-Students recognise how living things are classified</p> <p>-students can describe differences in life cycles of mammals, amphibians, insects and birds.</p> <p>-students can identify how animals and plants are adapted to suit their environment</p>
Assessment Objectives	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p>	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific enquiry, techniques and procedures.</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p>	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific enquiry, techniques and procedures.</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p>	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific enquiry, techniques and procedures.</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p> <p>3a) develop experimental procedures</p> <p>3b) improve experimental procedures.</p>	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific enquiry, techniques and procedures.</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p> <p>3a) develop experimental procedures</p> <p>3b) improve experimental procedures.</p>	<p>AO1: Demonstrate knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific techniques and procedures.</p> <p>AO2: Apply knowledge and understanding of:</p> <p>1) scientific ideas</p> <p>2) scientific enquiry, techniques and procedures.</p> <p>AO3: Analyse information and ideas to:</p> <p>1a) interpret</p> <p>1b) evaluate</p> <p>2a) make judgements</p> <p>2b) draw conclusions</p>
Vocabulary / Key Subject Terminology	<p>Independent variable</p> <p>Dependant Variable</p> <p>Control Variable</p> <p>Hypothesis</p> <p>Accuracy</p> <p>Precision</p>	<p>Density</p> <p>Solubility</p> <p>Solvent</p> <p>Solute</p> <p>Saturated solution</p> <p>Neutralisation</p> <p>Rate of reaction</p>	<p>Energy store</p> <p>Kinetic Energy</p> <p>Gravitational potential energy</p> <p>Elastic energy</p> <p>Thermal energy</p> <p>Chemical energy</p> <p>Efficiency</p> <p>Finite</p>	<p>Non Contact force</p> <p>Contact force</p> <p>Speed</p> <p>Velocity</p> <p>Friction</p> <p>Pressure</p>	<p>Nucleus</p> <p>Cytoplasm</p> <p>Chloroplasts</p> <p>Chlorophyll</p> <p>Photosynthesis</p> <p>Enzymes</p> <p>Aerobic respiration</p> <p>Anaerobic respiration</p>	<p>Community</p> <p>Ecosystem</p> <p>Population</p> <p>Biotic</p> <p>Abiotic</p> <p>Interdependent</p> <p>Biodiversity</p>

Assessment 1	100 knowledge retrieval questions from AUT1	100 knowledge retrieval questions from AUT1 and AUT2	100 knowledge retrieval questions from AUT1, AUT2 and SP1	100 knowledge retrieval questions from AUT1, AUT2, SP1 and SP2	100 knowledge retrieval questions from AUT1, AUT2, SP1, SP2 and SUM1	100 knowledge retrieval questions from AUT1, AUT2, SP1, SP2, SUM1 and SUM2
Assessment 2	Mastery task	Mastery tasks	Mastery tasks	Mastery tasks	Mastery tasks	- Mastery tasks - End of year progression test to formally assess progress against the curriculum
Cross Curricular Links with other Faculties	-Skills topics for analysing data and drawing conclusions links with the skills course in Geography for AUT 1 whereby students in both science and geography will be analysing raw data to identify trends and patterns along with valid conclusions using their knowledge and understanding. -Maths AUT 1 focuses on drawing graphs and describing trends -British Value link to ‘Rule of Law’ and why we have rules and regulations in the laboratory	-Maths focus on drawing graphs and describing trends -Links with food technology in terms of accurately measuring amounts of substances -British Value link to ‘Mutual Respect’ when engaging in group work	-Students use formulas and change the subjects of equations which is in line with maths SPR 1 SOL -British Value link to ‘Individual Liberty’ in regards to the use of non-renewable energy resources	-The autobiographical unit in English can serve to look at Isaac Newton -The use of equations, formulas and graph interpretation links with mathematics - students study weight/mass with quantities in year 8 composite 4 for Spanish -British Value link to ‘Rule of Law’ and the use of drugs whilst driving	Links to PE in terms of the content surrounding gas exchange, respiration and the effects of exercise on the body. - students study body parts and illnesses in year 9 composite 3 for Spanish -British Value link to ‘Mutual respect’ in regards to scientists making valuable discoveries.	Links with Geography ecosystems, desert, weather and climate discussing the impact of human population explosion -British Value link to ‘Individual Liberty’, ‘Mutual Respect’ and ‘Tolerance’ in regards to gender identity. -British Value link to ‘Rule of Law’ in regards to the protection of wildlife.
Knowledge Organiser content	Variables, accuracy and precision, planning an investigation, presenting data, drawing graphs, Atoms, elements, compounds, mixtures, types of chemical reactions, word equations, gas tests	Particle theory, changes of state, density, solubility, acids, alkalis, neutralisation, reversible and irreversible reactions, reaction rates	Energy stores, kinetic energy, gravitation potential energy, elastic energy, conservation of energy, work done, power, energy resources, energy transfer diagrams, maths in science	Forces, speed, distance-time, velocity-time, acceleration, momentum, Newton’s Laws, moments, levers, gears, road safety, pressure, Hooke’s Law	microscopes and magnification , animal cells, plant cells, prokaryotes, specialised cells, diffusion, osmosis, transpiration, cells tissues and organs, organ systems, respiration, photosynthesis, digestion and enzymes, metabolism	Ecosystems, food chains, food webs, predator prey relationships, pyramids of numbers and biomass, abiotic and biotic factors, competition, animal adaptations, plant adaptations, maintaining biodiversity, carbon cycle, sampling techniques, investigating pollution
Extra-Curricular Offer	Practical planners Club -students carry out a series of practical investigations looking into hypotheses and variables	Solution Squad Club- Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Bright Sparks club- Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	May the force be with you club- Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Metabolic masters club Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Earth Warriors club- Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning

SCIENCE YEAR 8

YEAR 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	<p><u>Composite: Understand the Structure of the atom and its Historical Development over time</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand the structure of the atom Understand what an Isotope is Understand the difference between an atom and an Ion <p>Component 2:</p> <ul style="list-style-type: none"> Understand how the periodic table has been developed Understand how the model of the atom has changed over time. Understand the properties of metals and non-metals <p>Component 3:</p> <ul style="list-style-type: none"> Understand the properties of the transition elements Understand the properties of the group 1 elements Understand the properties of the group 7 elements <p>Component 4:</p> <ul style="list-style-type: none"> Understand the patterns in reactivity of Group 1 and 7 Understand the properties of the group 8/0 elements Consolidate learning and understanding through a Mastery Task <p>Component 5:</p> <ul style="list-style-type: none"> Understand chemical formula and chemical equations Understand how to calculate the relative formula mass of a compound Understand the Law for the Conservation of mass <p>Component 6:</p> <ul style="list-style-type: none"> Understand why some chemical reactions appear to change in mass Understand how measurements can have a degree of uncertainty 	<p><u>Composite: Understand the different processes of Separating Mixtures and the Use of Materials on the Earth's Atmosphere</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand what a mixture is Understand the process of Filtration Understand what Hydrocarbons are and how they can be used <p>Component 2:</p> <ul style="list-style-type: none"> Understand what an Alkane is Understand what Crude oil is and how it can be separated Understand what an Alkene is <p>Component 3:</p> <ul style="list-style-type: none"> Understand what Cracking is Understand what a Polymer is Understand the properties of Polymers <p>Component 4:</p> <ul style="list-style-type: none"> Understand the importance of Recycling Explore ideas surrounding the burning of fuels Consolidate learning through the application to unfamiliar contexts State some uses of fuels. Describe what makes a good fuel. Write word and symbol equations for burning common fuels <p>Component 5:</p> <ul style="list-style-type: none"> Understand the implications of Global Warming Understand the implications of Acid rain Understand the composition of gases in earths early atmosphere <p>Component 6:</p> <ul style="list-style-type: none"> Understand the composition of gases in earth's atmosphere Understand the importance of the Carbon Cycle Understand how humans are impacting their environment <p><u>Composite 2: Understand changes within the human body, how to stay healthy</u></p>	<p><u>Composite: Understand the Principles of Electricity and how Magnetic Forces can Induce an Electrical Current</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Explore static electricity Explore key features in electrical circuits Explore the properties of series circuits <p>Component 2:</p> <ul style="list-style-type: none"> Explore the properties of parallel circuits Explore the effects of resistance on current and voltage in a circuit <p>Component 3:</p> <ul style="list-style-type: none"> Explore the structure of plugs Explore the power of electrical appliances Understand magnetism and magnetic forces <p>Component 4:</p> <ul style="list-style-type: none"> Understand how a compass works and how magnetic field lines are formed around a magnet Understand what a solenoid is Understand what an Electromagnet is <p>Component 5:</p> <ul style="list-style-type: none"> Understand how an Electric Motor works Understand how a loud speaker is able to generate sound Understand how transformers work 	<p><u>Composite: Understand the Properties and uses of Different Types of Wave</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Explore the features of a wave Understand the difference between transverse and longitudinal waves Investigate how to measure the speed of a wave <p>Component 2:</p> <ul style="list-style-type: none"> Understand the reflection of light Understand the refraction of light Explore the properties of sound waves <p>Component 3:</p> <ul style="list-style-type: none"> Explore the properties and uses of ultrasound Explore how Earthquakes are detected Understand the types of wave that make up the electromagnetic spectrum <p>Component 4:</p> <ul style="list-style-type: none"> Understand the properties and uses of gamma rays Explore the structure of the solar system Explore the development of the earth <p>Component 5:</p> <ul style="list-style-type: none"> Explore the development of Mars Explore the search for extra-terrestrial life 	<p><u>Composite: Understand the Development of Genetic Evolution</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand what DNA is and the importance of Genes Explore how features can be affected by genes or the environment Predict the probability of a characteristic being inherited <p>Component 2:</p> <ul style="list-style-type: none"> Understand the importance of Mendel's investigations in testing and investigating Hypotheses Predict the probability of an inherited disease being passed on to offspring Understand the importance and usefulness of stem cells <p>Component 3:</p> <ul style="list-style-type: none"> Understand the importance of Genetic screening Understand the importance of the human genome Explore how variation exists within all species <p>Component 4:</p> <ul style="list-style-type: none"> Understand how all species of living things evolved from simple life forms Understand the process of Natural Selection Explore how Lamarck's theory of evolution was different to Darwin's <p>Component 5:</p> <ul style="list-style-type: none"> Explore how organisms can become extinct Understand how fossils can give us evidence for evolution Explore how organisms can be Classified <p>Component 6:</p> <ul style="list-style-type: none"> Understand the difference between Sexual and Asexual reproduction 	<p><u>Composite: Understand how our Body Regulates and Responds to Changes in the internal and external environments</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand what homeostasis is and the importance of regulating internal conditions in the body Explore how the body coordinates movement and protects itself from harm Explore the factors that affect the reaction times of an individual <p>Component 2:</p> <ul style="list-style-type: none"> Understand what the Endocrine system is and what it is responsible for Understand the importance of controlling the glucose levels in the body Explore the different hormones involved in the menstrual cycle <p>Component 3:</p> <ul style="list-style-type: none"> Explore the different forms of contraception that are available Understand what a non-communicable disease is and the factors that can increase your chances of developing a non-communicable disease Understand what a communicable disease is and the role pathogens play in spreading diseases <p>Component 4:</p> <ul style="list-style-type: none"> Explore bacterial diseases and preventing their spread Explore viral diseases and compare them to bacterial diseases

	<ul style="list-style-type: none"> Understand how to find the concentration of a solution Component 7: <ul style="list-style-type: none"> Understand how the yield of a chemical reaction is calculated Understand why the yield in a chemical reaction is never 100% 	<u>within a sexual relationship and methods to treat infertility in Sex education</u> Component 1: <ul style="list-style-type: none"> Explore how puberty prepares us for conception Explore the female reproductive system Explore the male reproductive system Consolidate our knowledge of Sex Education 			<ul style="list-style-type: none"> Understand how Selective Breeding can be used to choose desirable characteristics Explore the different methods of producing cloned organisms Understand the benefits and concerns of Genetically Modified crops 	<ul style="list-style-type: none"> Understand the difference between a fungal disease and a protist disease Component 5: <ul style="list-style-type: none"> Understand how the immune system protects the body from disease Understand how Antibiotics can be used to protect us from some types of disease Understand how a Vaccination can protect us from diseases Explore the process by which new drugs are developed
Prior knowledge and skills (from previous year / key stage)	-Students can identify changes associated with some reactions such as burning and on the action of acid with bicarbonate of soda -students should be able to construct simple word equations	-Students should have knowledge of how to separate mixtures through filtering, sieving and evaporation -students should recognise some gases released from reactions	-students can recognise symbols used in a simple circuit diagram -students can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	-Students recognise that light appears to travel in straight lines -Students understand that objects are seen because light enters the eyes -Students can recognise reflection -Students may have prior knowledge of the space from primary school	-Recognise that living things have changes over time and that fossils provide information about living organisms that inhabited the Earth millions of years ago -identify that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. -identify how adaptations may lead to evolution	-students should be able to describe how some nutrients and water are transported within animals, including humans. -students should recognise the effects of exercise
Assessment Objectives	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2b) draw conclusions	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2b) draw conclusions 3b) improve experimental procedures.
Vocabulary / Key Subject Terminology	Proton Electron Neutron Conservation Exothermic Endothermic	Global warming Emission Alkane Alkene Physical process Mixture	Resistance Current Charge Voltage Series circuits Parallel Circuit Permanent magnet	Longitudinal Transverse Oscillation Reflection Refraction Perpendicular Orbit Asteroid Satellite Red shift	Gamete Allele Homozygous Heterozygous Dominant Recessive Extinction	Hormone Receptor Stimulus Effector Placebo Efficacy Toxicity

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Assessment 2	Mastery tasks	Mastery tasks	Mastery tasks	Mastery tasks	Mastery tasks	- Mastery tasks - End of year progression test to formally assess progress against the curriculum
Cross Curricular Links with other Faculties	Links to maths for plotting data on graphs as well as completing algebraic style equations and interpreting data to describe trends -British Value link to ‘Mutual respect’ in regards to scientists making valuable discoveries.	- students study environmental problems and solutions in year 9 composite 4 for Spanish Links to English in relation to ‘News’ for the impact of global warming in current Government arguments and politics which is represented in the News frequently Links to Maths with interpretation data from graphs and pie charts along with describing trends in data -British Value link to ‘Individual Liberty’ and views in regards to Global Warming.	Links with KS3 maths when students must change the subject of a formula and complete calculations using standard form -British Value link to ‘Rule of Law’ and why we have rules and regulations in the laboratory.	Links with KS3 maths when students must change the subject of a formula and complete calculations using standard form -British Value link to ‘Individual Liberty’ when using medical equipment to check the health of an unborn baby.	This unit serves to aid in the science behind natural selection and evolution ready for the yr 9 AUT 1 teaching of Jekyll and Hyde -British Value link to ‘Tolerance’ and ‘Mutual Respect’ when discussing ethical issues surrounding stem cell therapy.	Links to KS4 History for the unit titled History of medicine -British Value link to ‘Individual Liberty’ in regards to the use of contraception.
Knowledge Organiser content	Atomic structures and electron configuration, isotopes, atoms into ions, periodic table, atomic model, metals and non metals, transition elements, group 1, group 7, group 0/8, chemical formulas and balancing equations, masses in reactions, % yield and atom economy, exothermic and endothermic, equilibrium	Cracking, alkanes, alkenes, polymers, distillation, reduce, recycling, global warming, Early atmosphere of the Earth	circuits, circuit symbols, current, potential difference, voltage, parallel and series circuit, electro magnets, generators, magnets, magnetism, static electricity ,	Transverse, Longitudinal waves, properties of waves, uses of waves, electromagnetic spectrum, uses of EM waves, reflection, refraction, communicating with waves, space, planet, asteroid, orbit	DNA, Genes, inherited and environmental characteristics, Genetic crosses, the human genome, Mendel, genetic disorders, genetic screening, stem cells, variation, evolution, natural selection, Lamarck, fossils, extinction, selective breeding, cloning, GM crops, classification	Homeostasis. The nervous system and reflexes, Reaction times, endocrine system, controlling blood glucose levels, hormones in menstruation, contraception, non-communicable diseases, communicable diseases and pathogens, bacterial diseases, viral diseases, fungal and protist diseases, the immune system and white blood cells, antibiotics, vaccinations, developing new drugs
Extra-Curricular Offer	The Big Bang Club: Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	The Climate Club Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Essential Electronics Club: Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Space Blasters Club: Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	DNAwesome Club: Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning	Germ Busters Club: Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning

SCIENCE YEAR 9

Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	<p><u>Composite: Understand the Role of Science in Pharmaceuticals and Similar based Industries</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand the differences between elements, compounds and mixtures Understand what makes a chemical substance pure Understand what makes a chemical substance impure Investigate the purity of a medicine based on properties <p>Component 2:</p> <ul style="list-style-type: none"> Understand how formulations are used in the medicine and other industries Explore the origins of common medical drugs Understand how illness and disease spread in society Understand how the body's immune system works <p>Component 3:</p> <ul style="list-style-type: none"> Consolidate learning and demonstrate skills of mastery Explore the role of antibiotics using analysis from aseptic techniques Explore how vaccination programmes work Understand how diseases are spread by viruses <p>Component 4:</p> <ul style="list-style-type: none"> Understand how diseases are spread by bacteria Understand how diseases are caused by fungi] Understand how diseases are caused by protists Understand how monoclonal antibodies are produced and used <p>Component 5:</p> <ul style="list-style-type: none"> Understand the stages in the development of new medical drugs Consolidate learning and demonstrate skills of mastery 	<p><u>Composite: Understand the Role of Science in Forensics and analysis</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how DNA is used for profiling Understand DNA and the genome Understand the process of decomposition Understand factors that can affect the rate of decay <p>Component 2:</p> <ul style="list-style-type: none"> Explore the rate of decomposition Explore how different microscopes are used to observe samples Consolidate learning and demonstrate skills of mastery Explore the use of chromatography in forensic science <p>Component 3:</p> <ul style="list-style-type: none"> Understand how to test for different gases Understand how to evaluate air and water pollution using indicator species Explore the level of pollution in samples of water <p>Component 4:</p> <ul style="list-style-type: none"> Explore why drinking some water could cause illness or death Explore water samples to investigate whether they are potable Understand how waste water is treated <p>Component 5:</p> <ul style="list-style-type: none"> Understand what factors can affect the stopping distance of a car Explore how speed is used by forensics science Understand how mass and acceleration can affect force Investigate factors that can affect momentum <p>Component 6:</p>	<p><u>Composite: Understand the role of science in Zoology and marine biology</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how organisms interact in an ecosystem Understand how organisms compete in an ecosystem Understand how organisms are adapted to their environment Understand how organisms are adapted to their environment <p>Component 2:</p> <ul style="list-style-type: none"> Understand how fish are adapted to aquatic environments Understand the adaptations of a fish's Anatomy <p>Component 3:</p> <ul style="list-style-type: none"> Understand how organisms are organised into feeding relationships Consolidate learning and demonstrate skills of mastery Understand how human population can affect biodiversity and ecosystems Understand methods that achieve food security <p>Component 4:</p> <ul style="list-style-type: none"> Explore the impact of natural habitat destruction Understand how the effect upon the environment causes changes to organism distribution Explore reasons why animals become extinct Explore how fossils develop <p>Component 5:</p> <ul style="list-style-type: none"> Explore how the impact of human activities is being reduced Explore careers in science 	<p><u>Composite: Understand the Role of Science in Cardiology and the Human Body</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand how the body is organised Understand what makes up the components in our blood Explore the role of the blood vessels in the body Explore the role of the heart in the body <p>Component 2:</p> <ul style="list-style-type: none"> Understand how coronary heart disease can be treated Consolidate learning and demonstrate skills of mastery Understand how surface area:volume ratio can affect exchange surfaces Understand how we release energy and the effects of exercise <p>Component 3:</p> <ul style="list-style-type: none"> Understand how the digestive system works to break down food Understand how to test for starch and sugars Understand how to test for protein Understand how to test for lipids <p>Component 4:</p> <ul style="list-style-type: none"> Understand metabolic rate and factors that can affect it Understand the application of maths in science Explore the role of a neurologist in studying the brain 	<p><u>Composite: Understand the Role of Science in Radiography:</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Understand the structure of the atom and isotopes Understand the difference between irradiation and contamination Understand the properties of alpha, beta and gamma radiation Understand the uses of radiation in society and their dangers <p>Component 2:</p> <ul style="list-style-type: none"> Understand what happens during radioactive decay Understand why a knowledge of half-life is important for radiography Understand what causes background radiation Understand how nuclear fission reactions occur <p>Component 3:</p> <ul style="list-style-type: none"> Understand how nuclear fusion reactions occur Explore the Chernobyl disaster Explore the properties of transverse and longitudinal waves Investigate the speed of waves <p>Component 4:</p> <ul style="list-style-type: none"> Explore the properties and uses of sound waves Explore the properties and uses of the electromagnetic spectrum Explore the use of X rays and CT scans Explore the properties and uses of ultrasound <p>Component 5:</p> <ul style="list-style-type: none"> Understand how heat travels by infrared radiation Explore black body radiation Understand why objects appear to be the colour they are Explore the reflection of light waves <p>Component 6:</p> <ul style="list-style-type: none"> Explore the refraction of light waves Understand the application of maths in science 	<p><u>Composite 1: Understand the Role of Science Engineering and automotive:</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Explore contact and non-contact forces Understand resultant forces Understand what work done is Understand the principles of moments <p>Component 2:</p> <ul style="list-style-type: none"> Understand the use of levers and gears Understand how pressure is used for hydraulics Explore the use of forces in industry Accurately read and find the average speed from a distance-time graph <p>Component 3:</p> <ul style="list-style-type: none"> Understand how to interpret velocity time graphs Understand how to calculate acceleration Understand how and when objects reach terminal velocity Explore how air resistance acts on objects <p>Component 4:</p> <ul style="list-style-type: none"> Explore how an understanding of how air resistance is used in sports Explore how an understanding of how water resistance is used in sports Explore how shape affects water resistance Explore car safety features

	<ul style="list-style-type: none"> Explore and understand non-communicable diseases Understand the effect of lifestyle on non-communicable diseases Component 6: <ul style="list-style-type: none"> Understand how the body controls blood glucose Understand the causes of diabetes Understand how cancers form and spread Understand the effects of caffeine on the body Component 7: <ul style="list-style-type: none"> Understand the application of maths in science Explore careers in science 	<ul style="list-style-type: none"> Understand the application of maths in science Explore careers in science Composite 2: Understand how Sexual Intercourse leads to Fertilisation in Sex education Component 1: <ul style="list-style-type: none"> Explore the process of sexual intercourse Understand how STIs affect the human reproductive system Understand the various stages of pregnancy Consolidate our knowledge of sex education 			<ul style="list-style-type: none"> Explore the role of a radiographer is diagnosing cancer 	
Prior knowledge and skills (from previous year / key stage)	Pupils should identify how pathogens can spread and examples of bacterial, viral and fungal infections	Pupils should recognise that two liquids can be soluble and identify how to take measurements to calculate speed	Students should be able to state examples of biotic and abiotic factors and recognise adaptations for animals living in different habitats	Students should be able to identify key structures of the heart and blood vessels that transport blood through the double circulatory system. Students should identify the equations for aerobic and anaerobic respiration.	Students should be able to state key differences between longitudinal and transverse wave and know the properties of waves. They should be able to state the law of reflection.	Students should identify examples of contact and non contact forces and how forces can affect an objects shape, speed and direction.
Assessment Objectives	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.	AO1: Demonstrate knowledge and understanding of: 1) scientific ideas 2) scientific techniques and procedures. AO2: Apply knowledge and understanding of: 1) scientific ideas 2) scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: 1a) interpret 1b) evaluate 2a) make judgements 2b) draw conclusions 3a) develop experimental procedures 3b) improve experimental procedures.
Vocabulary / Key Subject Terminology	Pathogens Placebo Efficacy Toxicity Formulations	Genome Chromosomes DNA Stopping distances	Biotic Abiotic Competition Biodiversity Ecosystem	Enzymes Catalysts Respiration Aerobic Anaerobic	Longitudinal Transverse Isotope Irradiation Contamination	Acceleration Pressure Contact force Non-contact force Resultant force
Assessment 1	100 knowledge retrieval questions from AUT1	100 knowledge retrieval questions from AUT1 and AUT2	100 knowledge retrieval questions from AUT1, AUT2 and SP1	100 knowledge retrieval questions from AUT1, AUT2, SP1 and SP2	100 knowledge retrieval questions from AUT1, AUT2, SP1, SP2 and SUM1	100 knowledge retrieval questions from AUT1, AUT2, SP1, SP2, SUM1 and SUM2

Assessment 2	Mastery tasks	Mastery tasks	Mastery tasks	Mastery tasks	Mastery tasks	<ul style="list-style-type: none"> - Mastery tasks - End of year progression test to formally assess progress against the curriculum
Cross Curricular Links with other Faculties	<ul style="list-style-type: none"> - students study body parts and illnesses in year 9 composite 3 for Spanish English are studying Jekyll and Hyde at this stage in their curriculum which has links to the science of developing drugs, bacterial resistance and immunity-the assessment mastery task in science is in the context of Dr Jekyll and Mr Hyde -British Value link to ‘Rule of Law’ in regards to the development of drugs 	Cross curricular links with maths using standard form, significant figures and SI units for data analysis -British Value link to ‘Individual Liberty’ and ‘Rule of Law’ in regards to national databases that store DNA information.	Links with Geography ecosystems, desert, weather and climate -British Value link to ‘Individual Liberty’ and ‘Rule of Law’ in regards to the protection of wildlife.	Cross-curricular links with PE who also study the structure of the heart and look into some of the effects of exercise such as breathing and pulse rates. -British Value link to ‘Individual Liberty’ in regards to the lifestyle people choose to lead.	Links with mathematics who also focus on changing the subject in an equation and rearrange formulas. For science tangents, algebra and describing trends in graphs also relies heavily on mathematics. -British Value link to ‘Individual Liberty’ when using medical imaging	Links with mathematics who also focus on changing the subject in an equation and rearrange formulas. Links with PE for resistance training from year 7. -British Value link to ‘Individual Liberty’, ‘Mutual Respect’ and ‘Tolerance’ in regards to lifestyle choices around sexual behaviour -British Value link to ‘Democracy’ in regards to using enhanced sports equipment
Knowledge Organiser content	Elements, compounds, mixtures, pure substances, impure substances, formulations, discovery of drugs, communicable diseases, immune system, bacterial, viral, fungal and protist diseases, monoclonal antibodies, developing new drugs, non communicable diseases, health and lifestyle, blood glucose levels, diabetes, cancer, smoking and its effects, alcohol, caffeine and reaction times, careers	DNA profiling, human genome, decomposition, factors affecting decay, microscopes, chromatography, testing for gases, indicator species, analysing water samples, potable water, waste water treatment, stopping distance, speed and velocity, force and acceleration, momentum	Communities, ecosystems, biotic and abiotic factors, competition, adaptations, feeding relationships, human impact and population, food security, deforestation, peat bogs, global warming, environmental impacts, extinction, fossils, maintaining biodiversity	Blood, blood vessels, heart, coronary heart disease, tissues, organs and organ systems, organs in exchange, Aerobic and anaerobic respiration, the effects of exercise, digestive system, food, enzymes, metabolism	Atoms, isotopes, contamination, irradiation, nuclear radiation, decay, background radiation, half-life, dangers and uses of radiation, fission, fusion, waves, reflection, refraction. EM spectrum waves	Contact and non-contact forces, resultant forces, work done, moments, levers and gears, pressure, distance-time graphs, velocity-time graphs, terminal velocity, acceleration, uniform acceleration, resistance, car safety features
Extra-Curricular Offer	The chemist club -students will develop their understanding of formulations further using practical investigative work	CSI Club -students will incorporate a range of forensic analysis techniques to solve a crime	Animal welfare club -Students will study a variety of animals including the science pets and a range of other species that will be brought in to see. Their understanding will be stretched beyond the specification to enhance their application skills.	Bodily basics club -students will explore the human body and the anatomy of other species in detail to apply their learning to familiar and unfamiliar contexts.	Astronomy club -students will explore how waves and radiation have helped build our knowledge of the solar system	Engineering enterprise club - Students explore this unit further using a series of practical investigations off the specification but relevant to the application of their learning