

INTENT

Our faculty mission is to create knowledgeable and scientifically literate learners by nurturing students' curiosity and bringing scientific phenomena into the classroom. We will prepare our students to become educated citizens capable of comprehending global and contemporary issues. The Ormiston SWB Science faculty will develop the minds of life-long learners by providing access to a fully inclusive Science education that will support their development through the acquisition of skills and knowledge through a progressively challenging curriculum. We want our students to experience and learn new skills and ideas in as many subjects as possible for as long as possible. We want our curriculum to provide students with knowledge and skills to retain and apply knowledge required to be successful and provide deep learning that accelerates our students understanding of the world around them.

	Prior learning	Year 7 focuses on the key fundamentals of Science to build on KS2 understanding of the building blocks of biological life, atoms and their link to materials as well as our solar system.
	Conscious curriculum links	Maths links: In maths students are required to manipulate data including, constructing graphs from tabular data, provide answers to specific significant figures, identify discrete and continuous data as well as calculating percentages etc. Students will practice these skills with a scientific focus throughout this year. Geography links: In geography students will be introduced to the three different rock types and how they influence the landscape. Students will build on this in science by understanding the rock cycle.
	Fieldwork opportunities	Students will have many opportunities throughout this year to practice their disciplinary skills and put theory into practice with scientific experiments. Students also have the opportunity to attend KS3 Science club and annual SciFest/Big Bang fair.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	BOM5 – Particle Model The differences in arrangements, motion of particles. -Atoms and molecules as particles. -The properties of different states of matter (solid, liquid and gas) in terms of particle model, including gas pressure. -The difference between physical and chemical changes. BOM6- The Atom -A simple (Dalton) atomic model. -Difference between atoms, elements and compounds. -Chemical symbols and formulae for elements and compounds. -Conservation of mass changes of state and chemical reactions. BE3 – Astrophysics -Our Sun as a star, other stars in the galaxy and other galaxies -Gravity force, weight = mass x gravitational fields strength (g), on Earth g=10 N/kg, different on other planets and stars. -Gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)	BBL1 – Animal Cells -The function of key subcellular organelles. -The hierarchical organisation of multicellular organisms -How to observe, interpret and record cell structure using a light microscope. -The structure, functions and biomechanic of the human skeleton and muscles. OEOO4 – Changing Shape -Forces measured in Newtons. -Forces as pushes or pulls, arising from the interaction between objects. -Non-contact forces: gravity forces acting at a distance on earth and in space. -Draw contact and non-contact forces, including magnetism, using force arrows to show each force acting upon an object. -Balanced forces and equilibrium. -Measurements of stretching or compression as force is changed.	BBL2 – Human reproduction -Reproduction in humans (as an example of a mammal) including the structure and function of the male and female reproductive systems and gametes. -The menstrual cycle (without details of hormones) -Fertilisation, gestation and birth, to include the role of the placenta. BOM7 – Changes of State -Conservation of materials and mass, reversibility, in melting, freezing, evaporation, sublimation, condensation and dissolving. -Similarities and differences, including density differences, between solids, liquids and gases. -Brownian motion of gases. -Diffusion in terms of the particle model. -Diffusion in liquids and gases by differences in concentration.	CR3 – Types of Reactions -Rearrangement of atoms. -Representing chemical reactions using formulae and using equations. -Combustion, thermal decomposition, oxidation and displacement reactions. -Word equations. THB7 – The Breathing System -The structure and functions of the gas exchange systems in humans, including adaptations to function. -The role of diffusion in the movement of materials. -The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume.	THB8 – Healthy Living -The structural adaptations of some unicellular organisms -The effects of recreational drugs (including substance misuse) on behaviour, health and life processes -The impact of exercise, asthma and smoking on the human gas exchange system -The effect of maternal lifestyle on the foetus through placenta. OE3 – The Cycles -The composition of the earth. -The structure of the earth. --The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. -Water cycle (First introduced in BOM3) -Water poverty and how it's being addressed.	BOM8 - Purity -Demonstrate that dissolving, mixing and changing of state are reversible changes. -The concept and identification of a pure substance -Mixtures, including dissolving. -Simple techniques for separating mixtures; filtration, evaporation, and distillation. BE4 – The Space Race -The light-year as an astronomical value. -Gravity force = weight x gravitational field strength, different on other planets and stars. -The objects that can be observed in the night sky; objects that can be observed by telescopes
SKILLS	Construct line graphs with given axis; Describe patterns and trends in given data; Recognise real applications of specific scientific ideas; Give specific examples of scientific or technological development, stating the purpose; Using a model to describe the structure of something we can't see with the eye; Recognise the importance of new evidence on the ideas/laws/theories of science and their real-world application; Provide answers to 2 significant figures and give answers in decimal form; Identify the strengths and weaknesses of specific models; Formulate a prediction based on learnt science; Identify one or more control variables in an investigation; Identify data as categoric, discrete or continuous; Interpret frequency tables, line graphs, bar graph and pie charts; Describe observations using cause and effect, identifying sources of random/systematic error; Draw straight forward conclusions from data presented; Find the mean, median and mode of a data set; Calculate percentage of a value; Formulate an opinion for or against a scientific or technological development, using moral and ethical implications to inform your opinion; Convert in, and out of standard form; Use a scientific calculator; Solve simple algebraic calculations (FIFA/FNAU)					
ASSESSMENT	Each topic will have an end of topic assessment in the form of a Live mark book test or a Silver assessment test. These assessments will be knowledge and skills tests which will be formally marked and feedback will be provided meaningful feedback on student learning, to aid in clearing misconceptions with students before moving onto another topic. Silver assessment feedback will provide a percentage achievement along with a QLA to show question by question analysis for individual students.					
	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BE3 Silver Assessment 1: BOM5 & BOM6	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BBL1 Silver Assessment 2: BBL1 & OEOO4	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BBL2 Gold Assessment	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BOM7 Silver Assessment 4: CR3 & BOM7	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: THB7 Silver Assessment 5: THB8 & OE3	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BOM8 Silver Assessment 6: BO8 & BE4 Platinum Assessment
VOCAB	•Mixture •Chemical compound •Reactants •Products. •Conservation of mass •Word equation	•Electrostatic force •Magnitude •Extension •Equilibrium •Motion •Gravity •Weight •Comet •Asteroid	•Sublimation •Displacement •Concentration •Meniscus •Diffusion •Melting •Freezing	•Combustion •Thermal decomposition •Oxidation •Displacement reactions •Bronchi •Bronchioles •Diaphragm •Vital Capacity	•Mantle •Atmosphere •Igneous •Sedimentary •Metamorphic •Tectonic •Protozoa •Plasmid •Stimulant	•Distillation •Insoluble •Soluble •Suspension •Mixture •Telescope •Light year •Gravity

READING SKILLS

In Science we use the careful reading strategy – before we read, we pre-teach vocabulary in context, during reading we have varying tasks such as picking out experimental variables; after reading we complete comprehension questions or conduct practical work based on our understanding.

PERSONAL DEVELOPMENT

CAREERS – Molecular biologist, midwifery
CORE: *Character* – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders

SUPPORTING STUDENT'S AT HOME

Students will have homework distributed weekly on a given day, to complete. Students can also be supported to revise and be tested on the content on their knowledge organisers.

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	Prior learning		Year 8 focuses on building onto the key fundamentals of Science learnt in Year 7. Key foci on topics of the biological building blocks of life are revisited and taken further with topics such as 'Cellular respiration' and 'Plants'.			
	Conscious curriculum links		Maths links: In maths students will go onto utilise and manipulate equations to change the subject- this skill is taught in this year. Further maths skills include conversion between units as well as graphical skills. Geography links: In geography students will revisit 'The Rock Cycle' taught in year 7 as well as the water and carbon cycle. These are all shared curricular taught in geography. Geographers will further be taught about global warming and climate change, something with is revisited in Science.			
	Fieldwork opportunities		Students will have many opportunities throughout this year to practice their disciplinary skills and put theory into practice with scientific experiments. Students also have the opportunity to attend KS3 Science club and annual SciFest/Big Bang fair.			
TOPIC, KNOWLEDGE	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
	CR4- The pH Scale -Define acids and alkalis in terms of neutralisation reactions -The PH Scale for measuring acidity, alkalinity; and indicators -Reactions of acids with metals to produce a salt plus hydrogen -Reactions of acids with alkali to produce a salt plus water. -Energy changes on changes of state (qualitative) -Exothermic and endothermic chemical reactions (qualitative) THB9- The Digestive System -Content of a healthy diet; carbohydrates, lipids, (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. -Calculations of energy requirements in a health daily diet. - The consequences of imbalances in the diet, including obesity, starvation, and deficiency disease. -The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply and biological catalysts). -The importance of bacteria in the human digestive system.	OE4- Our Atmosphere -The composition of the atmosphere -The carbon cycle -The production of carbon dioxide by human activity and the impact on climate -Earth as a source of limited resources and the efficacy of recycling BOE10- The Principles of Energy -Energy as a quantity that can be calculated -Internal energy stored in materials. -Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes. -The total energy has the same value before and after a change. -Comparing the starting with the final conditions of a system and describing increases and decreases in amounts of energy associated with movements, temperature, changes in position in field, in elastic distortions and chemical compositions. -Other processes that involve energy transfer, changing motion, dropping an object, completing an electrical circuit, BOE11- Heating and Cooling -Temperature and how to measure temperature difference. -Comparing energy values of different foods (from labels and testing) kJ. -Energy transfer from hotter to cooler objects by conduction and convection. -Energy transfer and thermal equilibrium.	BBL3- Cellular Respiration -Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical process necessary for life. -A word summary for aerobic respiration. -The process of anaerobic respiration in humans and microorganisms, including, fermentation, and a word summary for anaerobic respiration. The difference between aerobic and anaerobic respiration in terms of reactants, the products formed and the implications of the organisms. BOE12- Energy in the Home -Fuels and energy resources. -Compare the power ratings of appliances in watts (W, kW). -Comparing amounts of energy transferred (J, kJ, kW hour). -Domestic fuel bills, fuel use and costs. BBL4- Plant Cells -The function of the cell wall, vacuole and chloroplasts. -Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope. -The similarities and differences between plant and animal cells. -Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms	OEOO5- Electrical Circuits Electrical current measured in amperes, in circuits, series and parallel circuits, current and where branches meet and current flow of charge. -Potential difference, measured in volts, battery, and bulb ratings; resistance, measured in ohms, as the ratio of potential difference. -differences in resistance between conducting and insulating components (quantitative) BOE13- Mechanical Waves -Waves on water as undulations which travel through water with transverse motion. -Frequencies of sound waves, measured in Hertz; echoes, reflection and absorption of sound. -Sound needs a medium to travel, the speed of sound in air, in water, in solids. -Sound produced by vibrations of objects, in loudspeakers. -The auditory range of humans and animals. -Pressure waves transferring energy; used for cleaning and physiotherapy.	OEOO6- Forces and Motion -The representation of a journey on distance on a distance-time graph -Speed and the quantitative relationships between average speed, distance, and time § Speed = distance ÷ time. -Relative motion: trains and cars passing each other. -Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative) resolving forces with multiple forces acting in parallel. -Change depending on direction of force and its size. IO12- Photosynthesis -The reactants in, and products of photosynthesis and a word summary of photosynthesis. -The dependence of almost all life on earth on the ability of photosynthesis organisms such as algae to use photosynthesis to build organic molecules that are an essential energy store and maintain levels of oxygen and carbon dioxide. -The adaptations of leaves for photosynthesis. -The role of stomata in gas exchange for plants. -Plants making carbohydrates in their leaves by photosynthesis and gains Disciplinary (those in bold being revisited in this unit)	BOM9- The Periodic Table -The principles underpinning the Mendeleev periodic table. -The periodic table; periods and groups; metals and non-metals -How patterns in reactions can be predicted with reference to the periodic table -The properties of metals and non-metals -The chemical properties of metal and non-metal oxides with respect of acidity OEOO7- Changing Forces -Forces: associated with deforming objects; stretching and squashing springs. -Force extension linear relation; Hooke's Law -Moment as the turning effect of a force -Simple machines give bigger force but at the expense of smaller movement
SKILLS	CCc4 Use scientific and mathematical conventions and vocabulary when communicating approaches to specific experiments or investigations may improve the evidence collected WCc3 Draw straight forward conclusions from data presented WCa3ii Construct scientific plans which will allow for reliable results to be collected 8h Make order of magnitude calculations 7h Interpret frequency tables, line graphs, bar graph and pie charts					
ASSESSMENT	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: CR4	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: THB9 Silver Assessment 1: OE4 & BOE10	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BOE11 Silver Assessment 2: BBL3 & BOE12 Gold Assessment	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BBL4 & OEOO5	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning Silver Assessment 3 BOE13 & OEOO6	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: IO12 & BOM9 Silver Assessment 4: BOM9 & OEOO7 Platinum Assessment
VOCAB	•Biuret •Enzyme •Lipid •Pancreas •Oesophagus •Acid •Neutralisation •Exothermic	•Photosynthesis •Climate change •Recycling •Joule •Lubricant •Kinetic Store •Thermal Store •Thermal Equilibrium	•Aerobic respiration •Anaerobic respiration •Fermentation •Stamen •Carpel •Stigma •Ovule	•Series circuit •Current •Resistance •Potential difference •Transverse •Longitudinal •Vibration	•Stomata •Xylem •Guard cells •Speed •Journey •Relative motion	•Malleable •Sub-atomic •Periodicity •Rotate •Pivot •Extension

READING SKILLS

In Science we use the careful reading strategy – before we read, we pre-teach vocabulary in context, during reading we have varying tasks such as picking out experimental variables; after reading we complete comprehension questions or conduct practical work based on our understanding.
A book year 8 students could read is DK (Dorling Kindersley), The Science Book: Big Ideas Simply Explained. This book Explores more than 80 of the world's most scientific theories and big ideas across the fields of physics, chemistry, biology, astronomy, geology and maths

PERSONAL DEVELOPMENT

CAREERS: Plant Geneticist; Environmental Impact Assessor; Industrial hygienist
CORE: *Character – Being a kind critical friend when giving peer feedback.*
Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders

SUPPORTING STUDENT'S AT HOME

Students have knowledge organisers and revision guides which correspond to the topics being taught at school. These are used to promote and assist SOLO work during revision and/or homework.
Students are provided with a fully detailed revision list prior to their mock exams with clear learning outcomes corresponding to the exam board specification.
Students are given revision homework tailored to their learning needs and assessment which is set and marked in class every week leading up to their assessment.

CURRICULUM AND ASSESSMENT PLAN

SCIENCE

YEAR 9

INTENT

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	Prior learning	Year 9 focuses on interleaving topics to deepen learning and a establish a solid foundation to begin GCSE content. This year the basic concepts of Science are revisited and built on to ensure building on current knowledge occurs in all lessons.
	Conscious curriculum links	Maths links: In maths students are required to rank order numbers based on their place value- these skills are used in topic such as OE009
	Extra-curricular	Students will have many opportunities throughout this year to practice their disciplinary skills and put theory into practice with scientific experiments. Students also have the opportunity to attend KS3 Science club and annual SciFest/Big Bang fair.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC: KNOWLEDGE	KS3- OE008. Magnetism -Magnetic poles; attraction and repulsion. -Magnetic fields by plotting with compass, representation by field lines. -Earth magnetism, compass, and navigation. -The magnetic effect of a current, electromagnets, DC motors (principles only). KS3- IOL13. Interdependence -The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops -Differences between species -The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops -The importance of plant reproduction through insect pollination in human food security -How organisms affect, and are affected by, their environment, including the accumulation of toxic material KS3- OE009. Gas Pressure -Atmospheric pressure decreases with increase of height as weight of air above decreases with height. -Pressure in liquids, increasing with depth, upthrust effects, floating and sinking. -Pressure measured by ratio force over area - acting normal to any surface. -Forces: associated; resistance to motion of air and water.	KS3- BBL5. Inheritance and Evolution -Heredity as the process by which genetic information is transmitted from one generation to the next. -A simple model of chromosomes, genes and DNA in heredity -Differences between species. -The variation between species being continuous of discontinuous -The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. -Changes in the environment may lead to lack of adaptation, which in turn may lead to extinction. -The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. KS3 - BOE14. Light waves - The differences between light and sound waves - How ray diagrams prove the law of reflection - How light waves change speed and direction due to different densities - How the eye produces images	KS3- CR5. The reactivity - Series of Metals -The order of metals and carbon in the reactivity series -The use of carbon in obtaining metals from metal oxides -What catalysts do -Properties of ceramics, polymers and composites (qualitative) -Introduction to symbol equations KS3 – OE010. Static Electricity -Forces between magnets and forces due to static electricity -Relationship between an electron and an atom. -Separation of positive or negative charges when objects are rubbed together, transfer of electrons, forces between charged objects. -The idea of electric field, forces acting across the space between objects not in contact KS3 – BE5. Life on Earth - How the Earth's axial tilt affects the length of days and seasons - How the rotation of the Earth on its axis affects day and night - How the angle of the Sun's rays affects the intensity of heat on the Earth's surface	GCSE- BBL6- Cells to Systems AQA Chemistry Specification points. 4.1.1.1 Eukaryotes and prokaryotes 4.1.1.2 Animal and Plant cells 4.1.1.5 Microscopy 4.1.1.3 Cell specialisation 4.1.1.4 Cell differentiation 4.1.2.3 Stem cells 4.2.1 Principles of organisation 4.2.2.2 Heart and blood vessels 4.2.2.3 Blood 4.2.2.5 Health issues 4.2.2.6 The effect of lifestyle style on some non-communicable diseases 4.2.2.4 Coronary heart disease	GCSE- BOM10. Atoms and the Periodic table AQA Chemistry Specification points 4.1.1.3 Development of the atomic model 4.1.1.1 Atoms, Elements and Compounds 4.1.1.4 Relative electrical charges of subatomic particles 4.1.1.5 Size and mass of atoms 4.1.1.6 Relative atomic mass 4.1.1.7 Electronic Structure 4.1.2.1 The periodic table 4.1.2.3 Metals and Non-metals 4.1.2.2 Development of the periodic table 4.1.1.2 Mixtures 4.1.2.5 Group 1 4.1.2.6 Group 7 4.1.2.4 Group 4.4.1.3 The development of the model of the atom 4.4.1.1 The structure of the atom 4.4.1.2 Mass number, atomic number and isotopes GCSE- BOM11. Energy and the particle model AQA Chemistry Specification points 4.2.2.2 State symbols 4.2.2.1 The three states of matter - AQA Physics Specification points 4.3.1.2 Changes of state 4.3.1.1 Density of Materials 4.3.2.1 Internal Energy 4.3.2.2 Temperature changes in a system and specific heat capacity 4.3.2.3 Changes of state and specific latent heat 4.3.3.1 Particle motion in gases	GCSE– OE011. Defining a force. AQA Chemistry Specification points 4.5.1.1 Scalar and Vector Quantities 4.5.1.2 Contact and non-contact forces 4.5.1.3 Gravity 4.5.1.4 Resultant Forces 4.5.6.1.1 Distance and Displacement 4.5.2 Work done and energy transfer 4.5.3 Forces and Elasticity 4.1.2 Changes in Energy (GPE only) *the relationship between Work done and Changes in energy will be explored in BOE16 (with the exception of GPE GCSE - CR6. Chromatography and Analysis. AQA Chemistry Specification points 4.1.1.2 Mixtures 4.8.1.1 Pure Substances 4.8.1.2 Formulations 4.8.1.3 Chromatography 4.8.2.1 Test for Hydrogen 4.8.2.2 Test for Oxygen 4.8.2.3 Test for Carbon Dioxide 4.8.2.4 Test for Chlorine
SKILLS	TSC5ii Categorise data as quantitative or qualitative; WCC3 Draw straight forward conclusions from data presented (WS3c); ASB4 Identify aspects of our lives, or the jobs that people do, which are based on scientific ideas; ASC4 Identify simple ethical or moral issues linked to scientific or technological developments; TSB5 Use abstract models when describing processes or phenomena. (WS1.2) TSC4i Use straight forward scientific evidence to answer questions, or to support their findings; 8f Use ratios; 8i Understand and use the symbols <>=>; TSC5i Identify scientific evidence that is being used to support or refute ideas or arguments; CCA3ii Identify data as categoric, discrete or continuous; IAA5ii Use appropriate sampling techniques, and or scientific procedures to collect data; 8g Construct a frequency table, identifying appropriate headings, values; 9e Construct and interpret histograms; 9f plot two variables from experimental data ASC6 Recognise complex moral and ethical implications of a scientific or technological development (WS1c) CCA8 Critically evaluate information, data and evidence from various sources, explaining limitations, misrepresentation or lack of balance in the process of interpretation IAA6iii Independently making and recording observations and measurements using a range of apparatus and methods. IAB6 Independently recognise familiar risks and make suggestions on how to control them. ATB7 Use a microscope to make observations of biological specimens and produce labelled scientific drawings. ATp1 Use of appropriate apparatus to make and record a range of measurements accurately, including length, area, mass, time, volume and temperature. Use of such measurements to determine densities of solid and liquid objects.					
ASSESSMENT	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: OE008 Silver Assessment 1: IOL13 & OE009	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BBL5 Silver Assessment 2: BBL5 & BOE14	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: CR5 Silver Assessment 3: OE010 & BE5 Gold Assessment	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: BBL6	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMBS: BOM10 & BOM 11	Formative: Live marking Verbal feedback 1,2,3 show me Write, pair, share Questioning LMB: OE011 & CR6 Platinum Assessment
VOCAB	• Magnetic field • Aroua Borealis • Electromagnet • DC Motor • Population • Ecosystem • Food security • Upthrust • Surface area • Air resistance	• Genome • Natural Selection • Conservation • Transverse • Longitudinal • Reflection • Refraction • Lens	• Friction • Electrostatic force • Van-de-Graaff • Highest common factor • Extraction • Polymer • Composite • Hemisphere • Equator • Axis • Rotation	• Ribosome • Prokaryotic • Embryonic stem cell • Platelets	• Neutron • Nuclear attraction • Electron configuration • Aqueous solution • Absolute zero • Resolution • Specific heat capacity	• Elastic deformation • Resultant force • Weight • Work done • Formulation • Retention factor • Bleach • Chromatography

READING SKILLS

In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

PERSONAL DEVELOPMENT

Career: Jeweller, Ecologist; Particle physicist
CORE: Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

Students have knowledge organisers and revision guides which correspond to the topics being taught at school. These are used to promote and assist SOLO work during revision and/or homework.
Students are provided with a fully detailed revision list prior to their mock exams with clear learning outcomes corresponding to the exam board specification.
Students are given revision homework tailored to their learning needs and assessment which is set and marked in class every week leading up to their assessment.

CURRICULUM AND ASSESSMENT PLAN

COMBINED SCIENCE

YEAR 10

INTENT

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Prior learning

GCSE Biology topic:
BBL6 – cells to systems

GCSE Chemistry topics:
BOM10. Atoms and the Periodic table
CR6. Chromatography and Analysis.

GCSE Physics topics:
BOM11. Energy and the particle model
OE0011. Defining a force.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	BBL7 – Digestion and Respiration AQA Combined Specification points. 4.1.3.1 Diffusion 4.2.2.1 The human digestive System 4.4.2.1 Aerobic and anaerobic respiration 4.4.2.2 Response to exercise 4.4.2.3 Metabolism OE0012 – IV Relationships AQA Combined Specification points. 4.2.1.1 Standard circuit diagram symbols 4.2.1.2 electrical charge and current 4.2.1.3 current, resistance and potential difference 4.2.1.4 resistors 4.2.2. Series and parallel circuits BOM12 – Types of Bonding AQA Combined Specification points. 4.2.1.5 Metallic Bonding 4.2.1.4 Covalent Bonding 4.2.1.3 Ionic Compounds 4.2.1.2 Ionic Bonding 4.2.1.1 Chemical bonds	BOM13 – Quantitative Chemistry AQA Combined Specification points. 4.3.2.5 Concentration of Solutions 4.3.2.4 Limiting Reactants 4.3.2.3 Using moles to balance equations 4.3.2.2 Amounts of substances in equations 4.3.1.4 Chemical measurements 4.3.1.2 Relative formula mass 4.3.1.3 Mass changes when a reactant or product is a gas 4.3.1.1 Conservation of mass and balanced equations 4.3.2.1 Moles BOE15 – Principles of Waves AQA Combined Specification points. 4.6.2.1 Types of electromagnetic waves 4.6.2.3 Properties of electromagnetic waves 4.6.2.2 Properties of electromagnetic waves 4.6.2.3/4 Use and application of EM waves 4.6.1.1 Transverse and longitudinal waves 4.6.1.2 Properties of waves OE0013 – Forces 2 Velocity and Acceleration AQA Combined Specification points. 4.5.1.1 Scalar and vector quantities 4.5.6.1.2 Speed 4.5.6.1.3 Velocity 4.5.6.1.4 Distance time relationships 4.5.6.1.5 Acceleration 4.1.1.2 changes in energy (KE and Elastic potential energy)	IO114 – Human Health AQA Combined Specification points. 4.1.2.1 Chromosomes 4.1.2.2 Mitosis and the cell cycle 4.2.2.7 Cancer 4.3.1.1 Communicable (infectious) diseases 4.3.1.5 Protist diseases 4.3.1.6 Human defence systems 4.3.1.4 Fungal diseases 4.3.1.3 Bacterial diseases 4.3.1.2 Viral diseases 4.3.1.8 Antibiotics and painkillers 4.3.1.9 Discovery and development of drugs 4.3.1.7 Vaccination OE5 – Carbon Chemistry AQA Combined Specification points. 4.7.1.4 Cracking and alkenes 4.7.1.2 Fractional distillation and petrochemicals 4.7.1.3 Properties of hydrocarbons 4.7.1.1. Crude oil, hydrocarbons, and alkenes 4.9.2.1 Greenhouse gases 4.9.1.4 How carbon dioxide decreased 4.9.1.3 How oxygen increased 4.9.1.1 the proportion of gases in our atmosphere 4.9.1.2 the earth early atmosphere CR7 – Trends and Patterns in the Reactivity Series AQA Combined Specification points. 4.4.1.2 The reactivity series 4.4.1.3 Extraction of metals and reduction 4.4.1.4 Oxidation and reduction in terms of electrons 4.4.1.1 Metal oxides 4.4.2.1 Reactions of acids with metals 4.4.2.2 Neutralisation of acids and salt production 4.4.2.3 Soluble salts 4.4.2.4 The pH Scale and neutralisation 4.4.2.6 Strong and weak acids	THB10 - Homeostasis AQA Combined Specification points. 4.5.1 - Homeostasis 4.5.2.1 - Structure and function 4.5.6.3.2 - Reaction time 4.5.3.1 - Human Endocrine System 4.5.3.2 - Control of blood glucose concentration 4.5.3.7 - Negative Feedback 4.5.3.4 - Hormones in human reproduction 4.5.3.6 - The use of hormones to treat infertility 4.5.3.5 - Contraception CR8 – Energy in Reactions AQA Combined Specification points. 4.5.1.1 Energy transfer during exothermic and endothermic reactions 4.5.1.2 Reaction profiles 4.5.1.3 The energy change of reactions	BOM14 – Atoms and Nuclear Radiation AQA Combined Specification points. 4.4.2.3 Half-lives and the random nature of radioactive decay 4.4.2.2 Nuclear equations 4.4.2.1 Radioactive decay and nuclear radiation 4.4.2.4 Radioactive Contamination 4.4.1.1 The structure of the atom 4.4.1.2 Mass number, atomic number and isotopes) OE0014 – Energy and Electricity AQA Combined Specification points. 4.2.3.2 Mains electricity 4.2.3.1 Direct and alternating potential difference 4.2.4.1 Power 4.2.4.2 Energy transfers in everyday appliances 4.2.4.3 The national grid 4.1.2.2 Efficiency 4.1.2.1 Energy transfers in a system, 4.3.2.2 4.1.1.4 Power 4.1.1.3 Energy changes in a system 4.1.1.1 Energy stores and systems OE6 – Resources AQA Combined Specification points. 4.1.3 National and global energy resources 4.10.2.2 ways of reducing the use of resources 4.10.2.1 Life cycle assessment 4.10.1.3 Wastewater treatment 4.10.1.4 Alternative methods of extracting metals 4.10.1.1 Using the earth's resources and suitable development 4.10.1.2 Potable water	BBL8 – Transport in Plants AQA Combined Specification points. 4.1.3.2 Osmosis 4.1.3.3 Active transport 4.2.3.1 Plant tissues 4.2.3.2 Plant and organ system 4.4.1.1 Photosynthetic reaction 4.4.1.2 Rate of photosynthesis 4.4.1.3 Uses of glucose from photosynthesis OE7 – Human Impact AQA Combined Specification points. 4.9.3.1 Atmospheric pollutants from fuels 4.9.3.2 Properties and effects of atmospheric pollutants 4.9.2.4 The carbon footprint and its reduction 4.9.2.3 global climate change 4.9.2.2. human activities which contribute to an increase in greenhouse gases in the atmosphere
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form of graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 3 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 3 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 3 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 3 Live mark book assessments • OAT Common Assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments

READING SKILLS

In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

CAREERS LINKS

- Health care professions
- Electrical engineering
- Industrial/Environmental chemist
- Robotics/Aerospace engineer

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

Students have knowledge organisers which correspond to the topics being taught at school. These are used to promote and assist SOLO work during revision and/or homework.

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Students are given revision homework tailored to their learning needs and assessment which is set and marked in class every week leading up to their assessment. We also offer homework club twice a week tailored for science SEND students lead by our specialist TA.

CURRICULUM AND ASSESSMENT PLAN

BIOLOGY

YEAR 10



INTENT

Our faculty mission is to create knowledgeable and scientifically literate learners by nurturing students' curiosity and bringing scientific phenomena into the classroom. We will prepare our students to become educated citizens capable of comprehending global and contemporary issues. The Ormiston SWB Science faculty will develop the minds of life-long learners by providing access to a fully inclusive Science education that will support their development through the acquisition of skills and knowledge through a progressively challenging curriculum.



Prior learning

GCSE Biology topic:
BBL6 – cells to systems

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC KNOWLEDGE	BBL7 – Digestion and Respiration AQA Biology Specification points. 4.1.3.1 Diffusion 4.2.2.1 The human digestive System 4.4.2.1 Aerobic and anaerobic respiration 4.4.2.2 Response to exercise 4.4.2.3 Metabolism IOL14 – Human Health AQA Biology Specification points. 4.1.2.1 Chromosomes 4.1.2.2 Mitosis and the cell cycle 4.2.2.7 Cancer 4.3.1.1 Communicable (infectious) diseases 4.3.1.5 Protist diseases 4.3.1.6 Human defence systems	IOL14 – Human Health AQA Biology Specification points. 4.3.1.4 Fungal diseases 4.3.1.3 Bacterial diseases 4.3.1.2 Viral diseases 4.3.1.8 Antibiotics and painkillers 4.3.1.9 Discovery and development of drugs 4.3.1.7 Vaccination THB10 - Homeostasis AQA Biology Specification points. 4.5.1 - Homeostasis 4.5.2.1 - Structure and function 4.5.6.3.2 - Reaction time 4.5.3.1 - Human Endocrine System 4.5.3.2 - Control of blood glucose concentration 4.5.3.7 - Negative Feedback 4.5.3.4 - Hormones in human reproduction 4.5.3.6 - The use of hormones to treat infertility 4.5.3.5 - Contraception	BBL8 – Transport in Plants AQA Biology Specification points. 4.1.3.2 Osmosis 4.1.3.3 Active transport 4.2.3.1 Plant tissues 4.2.3.2 Plant and organ system 4.4.1.1 Photosynthetic reaction 4.4.1.2 Rate of photosynthesis 4.4.1.3 Uses of glucose from photosynthesis	IOL17 – Identification of disease AQA Biology Specification points. 4.1.1.6 Culturing microorganisms 4.3.2.1 - Producing monoclonal antibodies 4.3.2.2 - Uses of monoclonal antibodies 4.3.3.1 - Detection and identification of plant diseases 4.3.3.2 - Plant defence responses	BBL9 – Reproduction AQA Biology Specification points. 4.6.1.1 Sexual and asexual reproduction 4.6.1.2 Meiosis 4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction 4.6.1.4 DNA and Genome 4.6.1.5 DNA 4.6.1.6 Genetic inheritance 4.6.1.7 Inherited disorders 4.6.1.8 Sex determination 4.6.2.1 Variation 4.6.2.2 Evolution 4.6.2.3 Selective breeding 4.6.2.4 Genetic engineering 4.6.2.5 Cloning	IOL15 – Classification AQA Biology Specification points. 4.6.3.1 The theory of evolution 4.6.3.2 Speciation 4.6.3.3 The understanding of genetics 4.6.3.4 Evidence of evolution 4.6.3.5 Fossils 4.6.3.6 Extinction 4.6.3.7 Resistant bacteria 4.6.4 Classification of living organisms
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment • OAT Common Assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment
VOCAB	• Cellular respiration • Digestion • Metabolism • Disease • Mitosis • Immune system • Phagocyte • Lymphocyte	• Antibiotic • Vaccine • Virus • Homeostasis • Endocrine • Gland • Glucoregulation	• Osmosis • Active transport • Xylem • Phloem • Sieve tube • Companion cell • Lignin • Photosynthesis	• Microorganism • Monoclonal antibodies • Myeloma • Hybridoma • Mechanical defences	• Reproduction • Meiosis • Gametes • Inheritance • Variation • Plasmid • Micropropagation	• Evolution • Speciation • Lamarck • Darwin • Wallace • Natural selection • MRSA

READING SKILLS

In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

CAREERS LINKS

- Health care profession
- Agriculture
- Ecology
- Geneticist

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.

Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes

Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment

Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

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CURRICULUM AND ASSESSMENT PLAN

CHEMISTRY

YEAR 10



INTENT

Our faculty mission is to create knowledgeable and scientifically literate learners by nurturing students' curiosity and bringing scientific phenomena into the classroom. We will prepare our students to become educated citizens capable of comprehending global and contemporary issues. The Ormiston SWB Science faculty will develop the minds of life-long learners by providing access to a fully inclusive Science education that will support their development through the acquisition of skills and knowledge through a progressively challenging curriculum.

←

Prior learning

GCSE Chemistry topics:
BOM10. Atoms and the Periodic table
CR6. Chromatography and Analysis.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	BOM12 – Types of Bonding AQA Chemistry Specification points. 4.2.1.5 Metallic Bonding 4.2.1.4 Covalent Bonding 4.2.1.3 Ionic Compounds 4.2.1.2 Ionic Bonding 4.2.1.1 Chemical bonds BOM13 – Quantitative Chemistry AQA Chemistry Specification points. 4.3.2.5 Concentration of Solutions 4.3.2.4 Limiting Reactants 4.3.2.3 Using moles to balance equations 4.3.2.2 Amounts of substances in equations 4.3.1.4 Chemical measurements 4.3.1.2 Relative formula mass 4.3.1.3 Mass changes when a reactant or product is a gas 4.3.1.1 Conservation of mass and balanced equations 4.3.2.1 Moles 4.3.5 Use of amount of substance in relation to volumes of gases	BOM13 – Quantitative Chemistry AQA Chemistry Specification points. 4.3.3.2 Atom Economy 4.3.3.1 Percentage Yield OE5 – Carbon Chemistry AQA Chemistry Specification points. 4.7.1.4 Cracking and alkenes 4.7.1.2 Fractional distillation and petrochemicals 4.7.1.3 Properties of hydrocarbons 4.7.1.1. Crude oil, hydrocarbons, and alkenes 4.9.2.1 Greenhouse gases 4.9.1.4 How carbon dioxide decreased 4.9.1.3 How oxygen increased 4.9.1.1 the proportion of gases in our atmosphere 4.9.1.2 the earth early atmosphere CR7 – Trends and Patterns in the Reactivity Series AQA Chemistry Specification points. 4.4.1.2 The reactivity series 4.4.1.3 Extraction of metals and reduction 4.4.1.4 Oxidation and reduction in terms of electrons	CR7 – Trends and Patterns in the Reactivity Series AQA Chemistry Specification points. 4.4.1.1 Metal oxides 4.4.2.1 Reactions of acids with metals 4.4.2.2 Neutralisation of acids and salt production 4.4.2.3 Soluble salts 4.4.2.4 The pH Scale and neutralisation 4.4.2.6 Strong and weak acids 4.4.2.5 Titrations 4.3.4 Using concentrations of solution in mol/dm3 CR8 – Energy in Reactions AQA Chemistry Specification points. 4.5.1.1 Energy transfer during exothermic and endothermic reactions 4.5.1.2 Reaction profiles 4.5.1.3 The energy change of reactions	OE6 – Resources AQA Chemistry Specification points. 4.1.3 National and global energy resources 4.10.2.2 ways of reducing the use of resources 4.10.2.1 Life cycle assessment 4.10.1.3 Wastewater treatment 4.10.1.4 Alternative methods of extracting metals 4.10.1.1 Using the earth's resources and suitable development 4.10.1.2 Potable water	OE7 – Human Impact AQA Chemistry Specification points. 4.9.3.1 Atmospheric pollutants from fuels 4.9.3.2 Properties and effects of atmospheric pollutants 4.9.2.4 The carbon footprint and its reduction 4.9.2.3 global climate change 4.9.2.2. human activities which contribute to an increase in greenhouse gases in the atmosphere BOM15 – Structure, Materials and their properties AQA Chemistry Specification points. 4.2.2.3 Properties of ionic compounds 4.2.3.3 Graphene and fullerenes 4.2.3.2 Graphite 4.2.3.1 Diamond 4.2.2.8 Metals as conductors 4.2.2.7 Properties of metals and alloys 4.2.2.6 Giant Covalent Structures 4.2.2.5 Polymers 4.2.2.4 Properties of small molecules 4.2.4.2 Uses of nanoparticles 4.2.4.1 Sizes of particles and their properties	CR9 – Electrolysis AQA Chemistry Specification points. 4.4.3.1 The process of electrolysis 4.4.3.2 Electrolysis of molten ionic compounds 4.4.3.3 Using electrolysis to extract metals 4.4.3.5 Representation of reactions at electrodes as half equations (HT only) 4.4.3.4 Electrolysis of aqueous solutions 4.5.2.1 Cells and batteries 4.5.2.2 Fuel cells BOM10 – Atoms and the periodic table AQA Chemistry Specification points. 4.1.3.2 Typical properties 4.1.3.1 Comparison with group 1 elements.
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments • OAT Common Assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments
VOCAB	• Bonding • Ionic • Covalent • Metallic • Mass number • Moles	• Alkane • Hydrocarbon • Alkene • Crude oil • Greenhouse gases • Reactivity series	• Acid • Alkali • Base • Salt • Neutralise • pH • Exothermic • Endothermic	• Life cycle assessment • Recycle • Potable water • Resources • Finite • Sustainable • Metal extraction	• Pollution • Climate change • Global warming • Greenhouse effect • Allotropes of carbon • Alloys • Polymers • Nanoparticles	• Electrolysis • Electrolyte • Cathode • Anode • Cation • Anion • Molten • Chemical cell • Fuel cell

READING SKILLS
In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

- CAREERS LINKS**
- Industrial/Environment al Chemistry
 - Pharmaceu tical Research
 - Chemical Engineer
 - Materials Engineer

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.

Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes

Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment

Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

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INTENT

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Prior learning

GCSE Physics topics:
BOM11. Energy and the particle model
OE0011. Defining a force.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	OE0012 – IV Relationships AQA Combined Specification points. 4.2.1.1 Standard circuit diagram symbols 4.2.1.2 electrical charge and current 4.2.1.3 current, resistance and potential difference 4.2.1.4 resistors 4.2.2. Series and parallel circuits BOE15 – Principles of Waves AQA Combined Specification points. 4.6.2.1 Types of electromagnetic waves 4.6.2.3 Properties of electromagnetic waves 2	BOE15 – Principles of Waves AQA Combined Specification points. 4.6.2.2 Properties of electromagnetic waves 1 4.6.2.3/4 Use and application of EM waves 4.6.1.1 Transverse and longitudinal waves 4.6.1.2 Properties of waves OE0013 – Forces 2 Velocity and Acceleration AQA Combined Specification points. 4.5.1.1 Scalar and vector quantities 4.5.6.1.2 Speed 4.5.6.1.3 Velocity 4.5.6.1.4 Distance time relationships 4.5.6.1.5 Acceleration 4.1.1.2 changes in energy (KE and Elastic potential energy) 4.5.6.1.5 Terminal velocity (graphs and forces)	BOM14 – Atoms and Nuclear Radiation AQA Combined Specification points. 4.4.2.3 Half-lives and the random nature of radioactive decay 4.4.2.2 Nuclear equations 4.4.2.1 Radioactive decay and nuclear radiation 4.4.2.4 Radioactive Contamination 4.4.1.1 The structure of the atom 4.4.1.2 Mass number, atomic number and isotopes)	OE0014 – Energy and Electricity AQA Combined Specification points. 4.2.3.2 Mains electricity 4.2.3.1 Direct and alternating potential difference 4.2.4.1 Power 4.2.4.2 Energy transfers in everyday appliances 4.2.4.3 The national grid 4.1.2.2 Efficiency 4.1.2.1 Energy transfers in a system, 4.3.2.2 4.1.1.4 Power 4.1.1.3 Energy changes in a system 4.1.1.1 Energy stores and systems 4.2.5.2 Electric Fields 4.2.5.1 Static charge	BOM11 - Energy and the particle model 4.5.4 Moments, levers and gears (OE0011) 4.3.3.2 Gas pressure 4.3.3.3 Increasing gas pressure BOM18 – Pressure 4.5.5.2 Atmospheric pressure 4.5.5.1.1 Pressure in fluids 4.3.3.2 Pressure in gases 4.3.3.3 Increasing the pressure of a gas 4.5.5.1.2 Pressure in Fluids 2	OE0015 – Newtons Laws (Forces 3) 4.5.6.3.1 Stopping distance 4.5.6.3.3 factors affecting braking distance 1 4.5.6.3.4 Factors affecting braking distance 2 4.5.6.2.1 Newtons first law (Revisit Forces 1) 4.5.6.2.2 Newtons second law 4.5.6.2.3 Newtons third law 4.5.7 Momentum (all aspects) (4.5.7.1.4.5.7.2,4.5.7.3) 4.5.7.3 Changes in Momentum
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 1 Live mark book assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments • OAT Common Assessment	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning • Cold calling Summative: • 2 Live mark book assessments
VOCAB	• Series • Parallel • Current • Potential difference • Resistance • Electromagnetic Spectrum • Transverse wave	• Frequency • Wavelength • Scalar • Vector • Speed • Velocity • Acceleration • Terminal Velocity • Potential energy	• Mass number • Isotope • Radiation • Contamination • Decay • Becquerels • Half-life • Nuclear	• Power • Energy transfer • Efficiency • Energy store • Static • National grid • Transformer	• Particles • Pressure • Collisions • Moment • Level • Gear • Pivot • Load • Effort	• Balanced forces • Unbalanced forces • Resultant force • Action-Reaction forces • Momentum • Collision • Conservation of momentum

READING SKILLS
In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

CAREERS LINKS
• Electrical engineer
• Mechanical engineer
• Renewable Energy Researcher
• Medical physicist
• Robotics

CORE
Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

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CURRICULUM AND ASSESSMENT PLAN

COMBINED SCIENCE

YEAR 11

INTENT

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Prior learning

CC Topics 5-13:
Chemical Bonding, Acids & Alkalis, Calculations Involving Masses, Electrolytic Processes, Obtaining & Using Metals, Dynamic Equilibrium and Groups in the Periodic Table

CP Topics 2, 4, 5, 6, 7, 8 & 9:
Motion & Forces, Waves, Light & the EM Spectrum, Radioactivity, Forces Doing work, Forces & their Effects and Electricity & Circuits

CB Topics 2, 3, 5-7
Cells & Control, Genetics, Health, Disease & the Development of Medicine, Plant Structures & their Functions and Animal Control & Coordination

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	CP10-13, CC14 All students will know: - Permanent and induced magnets and magnetic fields - How fields from individual coils in a solenoid react - Using the power equation for transformers - Calculating density - Specific heat capacity and specific latent heat - Kelvin and Celsius temperature scales - The relationship between force and extension - Calculating spring constant and work done when stretching a spring	CC15-17, CB 7 All students will know: - Measuring and calculating rates of chemical reactions - Energy transfers in a chemical reaction - Alkanes as a homologous series - Fractional distillation of crude oil and cracking of alkanes - Changes in the Earth's atmosphere over time - Endocrine glands - How the menstrual cycle is controlled by hormones and how hormones are used in contraception - How glucoregulation occurs	CB8-9 All students will know: - Gas exchange and surface area:volume ratio - Anaerobic and aerobic respiration - The circulatory system - How ecosystems are organised - How communities are affected by abiotic and biotic factors - How the abundance and distribution of organisms are measured - How energy is transferred through trophic levels - How humans affect ecosystems and biodiversity - Carbon, nitrogen and water cycle	REVISION PROGRAMME All students will recap knowledge and skills from: CB1-5 - Key concepts in biology - Cells and control - Genetics - Natural Selection & Genetic Modification - Health, disease and development of medicine CC1-12 - States of matter - Atomic structure - Periodic table - Ionic & Covalent bonding - Types of substances - Acids & alkalis - Calculations involving masses - Electrolytic Processes - Using & Obtaining Metals - Reversible reactions & Equilibria CP1-6 - Forces & Motion - Conservation of energy - Waves - Light & the electromagnetic spectrum - Radioactivity	REVISION PROGRAMME All students will recap knowledge and skills from: CB6-9 - Plant structure & function - Animal coordination & control - Exchange & transport in animals - Ecosystems & material cycles CC13-17 - Groups of the periodic table - Rates of reaction - Energy changes in reactions - Fuels - Earth & atmospheric science	REVISION PROGRAMME All students will recap knowledge and skills from: CP7-13 - Energy - Forces & their effects - Electricity & circuits - Magnetism & the motor effect - Electromagnetic induction - Particle model - Forces & matter
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments	One summative assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments - One assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)
VOCAB	- Magnetic field - Permanent magnet - Induced magnet - Plotting compass - Solenoid - Electromagnet - Motor effect - Magnetic flux density - Alternating , direct current - Transmission line - Kinetic theory - Conserved - Density - Specific heat capacity - Specific latent heat - Kelvin	- Rate of reaction - Successful collisions - Frequent collisions - Exothermic - Endothermic - Reaction profile - Fractional distillation - Hydrocarbon - Alkane - Cracking - Endocrine gland - Hormone - Oestrogen - Progesterone - Insulin - Glycogen - Diabetes - Target organ	- Alveoli - Aerobic respiration - Anaerobic respiration - Mitochondria - Blood vessel - Artery - Vein - Capillary - Biotic - Abiotic - Gas exchange - Belt transect - Quadrat - Random sampling - Eutrophication - Fertilisers - Biodiversity - Fish farming - Abundance - Distribution			

READING SKILLS

In science we use the careful reading strategy with our core practicals and other relevant tasks – before we read, we cover the theory behind the practical using carefully selected tasks that apply, during reading we highlight the method and identify equipment and variables; after reading, we allow pupils to demonstrate the practical, collect data and use data where applicable e.g drawing a graph using raw results.

CAREERS LINKS

- Health care profession
- Electrician
- National Grid engineer
- Environmental Biologist

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.

Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes

Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment

Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

Students have knowledge organisers and revision guides which correspond to the topics being taught at school. These are used to promote and assist SOLO work during revision and/or homework.

Students are provided with a fully detailed revision list prior to their mock exams with clear learning outcomes corresponding to the exam board specification.

Students are given revision homework tailored to their learning needs and assessment which is set and marked in class every week leading up to their assessment. We also offer homework club twice a week tailored for science SEND students lead by our specialist TA.

INTENT

Our faculty mission is to create knowledgeable and scientifically literate learners by nurturing students' curiosity and bringing scientific phenomena into the classroom. We will prepare our students to become educated citizens capable of comprehending global and contemporary issues. The Ormiston SWB Science faculty will develop the minds of life-long learners by providing access to a fully inclusive Science education that will support their development through the acquisition of skills and knowledge through a progressively challenging curriculum.



Prior learning

SB Topics 2, 3, 5 & 6
Cells & Control, Genetics, Health, Disease & the Development of Medicine, Plant Structures & their Functions

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	SB7 All students will know: - Endocrine glands - How the menstrual cycle is controlled by hormones and how hormones are used in contraception - The importance of homeostasis - How thermoregulation, osmoregulation and glucoregulation occurs - How thyroxine and adrenaline affect the body - How a negative feedback mechanism works	SB8 All students will know: - Gas exchange and surface area:volume ratio - Fick's law and diffusion - Anaerobic and aerobic respiration - The circulatory system	SB9 All students will know: - How ecosystems are organised - How communities are affected by abiotic and biotic factors - How the abundance and distribution of organisms are measured - How energy is transferred through trophic levels - Parasitism and mutualism - How humans affect ecosystems and biodiversity - Carbon, nitrogen and water cycle - Indicator species to assess pollution levels - Rates of decomposition and why they vary	REVISION PROGRAMME All students will recap knowledge and skills from: SB1-5 - Key concepts in biology - Cells and control - Genetics - Natural Selection & Genetic Modification - Health, disease and development of medicine	REVISION PROGRAMME All students will recap knowledge and skills from: SB6-8 - Plant structure & function - Animal coordination & control - Exchange & transport in animals	REVISION PROGRAMME All students will recap knowledge and skills from: SB9 Ecosystems & material cycles
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments	One summative assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments - One assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)
VOCAB	- Endocrine gland - Hormone - Oestrogen - Progesterone - Insulin - Glycogen - Diabetes - Target organ	- Alveoli - Aerobic respiration - Anaerobic respiration - Mitochondria - Blood vessel - Artery - Vein - Capillary	- Biotic - Abiotic - Gas exchange - Belt transect - Quadrat - Random sampling - Eutrophication - Fertilisers - Biodiversity - Fish farming - Abundance - Distribution			

READING SKILLS

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CAREERS LINKS

- Health care profession
- Environmental Biologist
- Ecologist
- Sports Scientist

CORE

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Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes

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CURRICULUM AND ASSESSMENT PLAN

CHEMISTRY

YEAR 11

INTENT

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Prior learning

SC Topics 5-19:
Chemical Bonding, Acids & Alkalis, Calculations Involving Masses, Electrolytic Processes, Obtaining & Using Metals, Dynamic Equilibrium, Transition Metals, Alloys & Corrosion, Quantitative Analysis, Chemical & Fuel Cells, Groups in the Periodic Table and Energy Changes in Chemical Reactions

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	SC20-22 All students will know: - Changes in the Earth's atmosphere - Causes and effects of climate change - Structures and properties of alkanes and alkenes	SC23-24 All students will know: - Structures and properties of alcohols and carboxylic acids - Production of ethanol from carbohydrates - Composition of biological polymers - Production of poly(ethane) and other polymers - Disposal and recycling of polymers	SC25-26 All students will know: - Identification of metal ions - Chemical tests for non-metal ions and ammonia - Instrumental methods of analysis and their advantages - Comparing the physical properties of different materials - Composite materials - Uses, properties and risks of nanoparticles	REVISION PROGRAMME All students will recap knowledge and skills from: SC1-16 - States of matter - Atomic structure - Periodic table - Ionic & Covalent bonding - Types of substances - Acids & alkalis - Calculations involving masses - Electrolytic Processes - Using & Obtaining Metals - Transition metals, corrosion & alloys - Quantitative analysis - Reversible reactions & Equilibria - Chemical and fuel cells	REVISION PROGRAMME All students will recap knowledge and skills from: SC17-25 - Groups of the periodic table - Rates of reaction - Energy changes in reactions - Fuels - Earth & atmospheric science - Hydrocarbons - Qualitative analysis - Polymers - Alcohols & carboxylic acids	REVISION PROGRAMME All students will recap knowledge and skills from: SC26 Bulk & surface properties of matter including nanoparticles
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments	One summative assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments - One assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)
VOCAB	- Fractional distillation - Hydrocarbon - Alkane - Alkene - Cracking - Functional group - Double bond - Saturated - Unsaturated - Bromine water - Decolourise - Addition reaction	- Carboxylic acid, - Alcohol - Fermentation - Polymer - Addition polymerisation - Condensation polymerisation - Ester link - Oxidation	- Cation - Anion - Flame test - Flame photometry - Qualitative test - Precipitate - Nanoparticle - Bulk material - Property			

READING SKILLS

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CAREERS LINKS

- Health care profession
- Industrial chemistry
- Life Cycle Assessment Certified Professional

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.

Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes

Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment

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SUPPORTING STUDENT'S AT HOME

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INTENT

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 Prior learning

CP Topics 2, 4, 5, 6 & 7:
Motion & Forces, Waves, Light & the EM Spectrum, Radioactivity, Astronomy

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	SP8,9,11,12 All students will know: - Work and power - Rotational forces, levers and moments - Current, charge and potential difference - Calculating resistance, power and energy transferred - Changing resistance - UK domestic electricity supply and earthing - Shape and size of electric fields - Phenomena caused by static electricity	SP13,14 All students will know: - Permanent and induced magnets - Magnetic fields - Electromagnetic fields around a coil of wire and factors that affect it - How fields from individual coils in a solenoid react - Using the power equation for transformers - Transformers in the national grid - Calculating the size and direction of the force in a wire carrying a current in a magnetic field - Calculating density - Specific heat capacity and specific latent heat	SP15 All students will know: - Kelvin and Celsius temperature scales - The relationship between force and extension - Calculating spring constant and work done when stretching a spring	REVISION PROGRAMME All students will recap knowledge and skills from: SP1-6 - Forces & Motion - Conservation of energy - Waves - Light & the electromagnetic spectrum - Radioactivity - Astronomy	REVISION PROGRAMME All students will recap knowledge and skills from: SP8-14 - Energy - Forces & their effects - Electricity & circuits - Static electricity - Magnetism & the motor effect - Electromagnetic induction - Particle model	REVISION PROGRAMME All students will recap knowledge and skills from: SP15 Forces & matter
SKILLS	Working scientifically: - Development of scientific thinking - Experimental skills and strategies - Representation, handling and manipulation of primary and secondary data in the form a graphs and tables - Analysis and evaluation - Scientific vocabulary, quantities, units, symbols, numerical conversion and nomenclature					
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling One summative assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning - Cold calling Summative: - Two Live mark book assessments - One assessment (exam) per discipline (3 exams total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)	Formative: - Live marking - Verbal feedback 1,2,3 show me - Questioning - Cold calling Summative GCSE examination – two exam papers per discipline (6 total)
VOCAB	- Free body diagram - Resultant force - Component - Moment - Rotation - Gears - Static induction - Discharge - Electrostatic - Force field - Field lines - Charge, - Coulomb (c) - Ohm (Ω) - Resistance - Diode - Light Dependent Resistor (LDR) - Thermistor - Watt (w) - Mains electricity - National grid	- Magnetic field - Permanent magnet - Induced magnet - Plotting compass - Solenoid - Electromagnet - Motor effect - Magnetic flux density - Split-ring commutator - Generator - Alternator - Alternating & Direct current - Transmission line - Transformer - Kinetic theory - Specific heat capacity - Specific latent heat - Kelvin	- Elastic - Inelastic - Compress - Linear - Non-linear - Proportional - Distortion - Spring constant - Extension - Work done - Immersion - Magnitude - Displacement			

READING SKILLS

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CAREERS LINKS

- Electrician,
- Automotive safety engineer
- Optician

CORE

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CURRICULUM AND ASSESSMENT PLAN

BTEC AAQ APPLIED SCIENCE

INTENT

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	Prior learning	KS3 link: Structure of the atom, structure and function of eukaryotic cells, energy transfers, changes of state, writing word equations, the periodic table KS4 link: Thermoregulation, osmoregulation, waves, Newtons laws of motion, refraction, ionic bonding, covalent bonding, metallic bonding, incomplete combustion, Ohms law, equations			
	Extra-curricular	University visits focused on healthcare careers, visits from meducators UK to deliver science/medical based workshops and 1 to 1 careers meetings to help pupils access subject specific work experience.			
	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1 & 2
TOPIC, KNOWLEDGE	Unit 3: Principles and Applications of Physics - A1 Working with waves - A2 Principles of optical fibres - B1 Measurement and representation of motion - B2 Laws of motion - C1 Use of electrical components - C2 Equations - C3 Electrical energy usage - C4 Energy transfer - C5 Change of state	Unit 1: Principles and Applications of Biology - A1 Structure and function of cells and tissues - A2 Structure and function of specialised cells in multicellular organisms - A3 Structure and function of biological tissues - B1 Structure and function of water - B2 Structure and function of carbohydrates - B3 Structure and function of proteins - B4 Structure and function of nucleic acids - B5 Structure and function of lipids - C1 Cell transport mechanisms - C2 Enzymes as biological catalysts - C2.3 Factors affecting enzyme activity - C3 Homeostasis	Unit 2: Principles and Applications of Chemistry - A1.1 Features of the periodic table and their relationship with atomic structure. - A1.2 Electronic structure - A1.3 Ionisation energy - B1.1 Metallic bonding and giant metallic structures - B1.2 Ionic bonding and giant ionic structures - B1.3 Covalent bonding and molecules - B1.4 Typical physical properties of substances - B1.5 Molecular shape - B1.6 Electronegativity and polarity - B1.7 Intermolecular forces - B1.8 Effect of hydrogen bonding on the properties of water - C1.1 Changes in physical properties for the elements across Period 3 - C1.2 Oxidation number concept, oxidation and reduction - C1.3 Trends and observations for the reactions of the Period 3 - C1.4 Differences in physical properties - C1.5 Acid-base behaviour of Period 3 oxides and hydroxides - C1.6 The action of water with Period 3 chlorides - C1.7 Write balanced equations for reactions - C1.8 Predict the physical and chemical properties - C1.9 Uses of Period 3 elements and compounds	- D1.1 Concept of the mole and use in calculations - D1.2 Chemical kinetics - D1.3 Chemical energetics - D1.4 Chemical equilibrium - D1.5 Application of chemical kinetics, energetics and equilibrium to the chemical industry - D1.6 Application of green chemistry in the chemical industry - E1.1 Knowledge and understanding of key terms used in organic chemistry - E1.2 Structure representations of organic compounds - E1.3 Naming alkanes, alkenes, halogenoalkanes and alcohols, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules - E1.4 Isomerism - E1.5 Sigma and pi molecular orbitals - E1.6 Changes in boiling point - E1.7 Types of reactions of organic compounds - E1.8 Reactions of commercial importance - E1.9 Benefits and problems arising from combustion - E1.10 Solutions to environmental problems	Bespoke revision programme created by KS5 lead leading up to their first unit 1, 2 and 3 exam sitting: - Students to cover skills and knowledge in a series of booklets consisting of exam questions - Students also complete a perfect paper , walking talking mock for each module and topic led by an expert teacher.
	SPEC	The full specification list including a transferable skills framework can be found: https://qualifications.pearson.com/content/dam/pdf/btec-aqqs/applied-science/2025/specification-and-sample-assessments/btec-national-in-applied-science-specification.pdf			
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning and use of cold calling		Summative: - Baseline assessment in Autumn 1 - End of topic tests for each sub section for each unit - Unit 1 Biology: 3 end of topic tests (A, B ,C) - Unit 2 Chemistry: 5 end of topic tests (A, B ,C, D, E) - Unit 3 Physics: 3 end of topic tests (A, B ,C) - Mid year assessment for Unit 2 and 1 in Autumn 2 - Unit 1, 2 and 3 mock exam in summer 2 (UCAS)		
VOCAB	Key terms and command words for the year 12 units can be found: https://qualifications.pearson.com/content/dam/pdf/btec-aqqs/applied-science/2025/specification-and-sample-assessments/btec-national-in-applied-science-specification.pdf				

READING SKILLS

In science we use the careful reading strategy which are demonstrated in the following ways:

- Reading and comprehension of practical instructions
- Reading and consolidation of large texts into notes for their books and/or knowledge organisers
- Use of mark schemes to self assess exam questions which emphasises exam specific vocabulary

CAREERS LINKS

Nurse, science teacher, medical lab technician, dental hygienist, midwife, clinical researcher assistant, radiographer, dietitian, mental health nursing etc.

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

Students are given transition packs when they attend sixth form taster day containing knowledge questions, books, videos and topics to research before their September start. Students are also provided with A3 empty knowledge organiser sheets which are used to consolidate learning at the end of the topics.

Students are provided with detailed assignment feedback which indicate any improvements. Students have access to classroom resources which are uploaded onto teams. Students are given 5 hours worth of homework every week tailored to their learning needs and exam board. Part of their homework includes the use of exam questions to strengthen their practice.

CURRICULUM AND ASSESSMENT PLAN

BTEC AAQ APPLIED SCIENCE

INTENT

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	Prior learning	KS3 link: Structure of the atom, structure and function of eukaryotic cells, energy transfers, changes of state, writing word equations, the periodic table KS4 link: Thermoregulation, osmoregulation, waves, Newtons laws of motion, refraction, ionic bonding, covalent bonding, metallic bonding, incomplete combustion, Ohms law, equations			
	Extra-curricular	University visits focused on healthcare careers, visits from meducators UK to deliver science/medical based workshops and 1 to 1 careers meetings to help pupils access subject specific work experience.			
	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1 & 2
TOPIC, KNOWLEDGE	Unit 4: Practical scientific procedures and techniques Task 1a: Preparation of a standard solution of sodium carbonate and use in volumetric analysis. Task 1b: Testing the purity of aspirin Task 2: Investigate the effect of light on plant growth Task 3a: Investigating the rate of transfer of thermal energy Task 3b: Investigating resistivity in electrical circuits Task 3c: Energy transfer from a renewable resource Task 4: Review of practical skills and personal competency in laboratory work		Retake exams in January (where applicable) - Unit 1: Principles and application of biology - Unit 2: Principles and application of chemistry - Unit 3: Principles and application of physics Unit 5: Science investigation skills Task 1: - Agree on an investigative project with supervisor/tutor. - Produce a project proposal and investigation plan. - Conduct a literature review and research relevant studies and information. - Identify and evaluate key sources related to the project. - Maintain a logbook of references and research notes. - Record analysis and evaluation of literature reviewed. - Develop a draft hypothesis based on research findings. - Refine and document the investigation plan in the logbook. Task 2: - Safely undertake the planned project Task 3: - Write a report of the project - Comparison of data to published data - Conclusions to summarise findings - Suggest improvements OR Unit 6: Contemporary issues in science Students to present work as a written report or in some other, relevant format. This could include: - presentation slides - video or podcast - a series of academic posters or alternative/suitable method - Analyse scientific reports - Write two articles on a scientific issue		Retake exams in May (where applicable) - Unit 1: Principles and application of biology - Unit 2: Principles and application of chemistry - Unit 3: Principles and application of physics
	SPEC The full specification list including a transferable skills framework can be found: https://qualifications.pearson.com/content/dam/pdf/btec-aqa/applied-science/2025/specification-and-sample-assessments/btec-national-in-applied-science-specification.pdf Pearson set assignment briefs (PSAB's) can be found under internal assessments: Applied Science (AAQ) Pearson qualifications				
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning and use of cold calling		Summative: • Practical observation feedback via practical observation records • Coursework feedback via assignment records for: • Unit 4: Practical scientific procedures and techniques • Unit 5: Science investigation skills OR Unit 6: Contemporary issues in science Optional assessments: • Unit 1, 2 and 3 (in-class) mock exams to prepare for retake exams where applicable • Unit 1,2 and 3 LMB reviews to prepare for retake exams where applicable		
	VOCAB Key terms and command words for the year 13 units can be found: https://qualifications.pearson.com/content/dam/pdf/btec-aqa/applied-science/2025/specification-and-sample-assessments/btec-national-in-applied-science-specification.pdf				

READING SKILLS

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- Reading and comprehension of practical instructions
- Reading and consolidation of large texts into notes for their books and/or knowledge organisers
- Use of mark schemes to self assess exam questions which emphasises exam specific vocabulary

CAREERS LINKS

Nurse, science teacher, medical lab technician, dental hygienist, midwife, clinical researcher assistant, radiographer, dietitian, mental health nursing etc.

CORE

Character – Being a kind critical friend when giving peer feedback. Ensuring learners aspire to high expectations in their attitude to Science because they see the relevance of the taught content to their everyday experiences.
Organisation – Completing all homework. Ensuring that they are equipped for lessons. Method writing to help learners sequence processes
Resilience – Not giving up when attempting hard skills. Working independently and being prepared to make mistakes in a safe and supportive environment
Excellence – Having high expectations with quality of one's own written work and presentation. Using Contextual Science to inspire learners about how science works around them every day. Communicating successes with pastoral leaders and parents/guardians regularly using the Academy's behaviour and rewards system

SUPPORTING STUDENT'S AT HOME

Students are provided with detailed assignment briefs with clear guidance from teaching staff regarding the criteria they need for relevant P.M.D criterion. Students are set weekly homework tasks equating to 5 hours a week where they can practice key skills needed to be demonstrated in their assignments.

Students are provided with detailed assignment feedback which indicate any improvements. Students have access to classroom resources which are uploaded onto teams. Students are given 5 hours worth of homework every week tailored to their learning needs and exam board where retake exams are concerned. Part of their homework includes the use of exam questions to strengthen their practice.

CURRICULUM AND ASSESSMENT PLAN

BIOLOGY

YEAR 12

INTENT

Our faculty mission is to create knowledgeable and scientifically literate learners by nurturing students' curiosity and bringing scientific phenomena into the classroom. We will prepare our students to become educated citizens capable of comprehending global and contemporary issues. The Ormiston SWB Science faculty will develop the minds of life-long learners by providing access to a fully inclusive Science education that will support their development through the acquisition of skills and knowledge through a progressively challenging curriculum.

	Prior learning	KS3 link: Development of DNA model by Watson and Crick. Differences between environmental and inherited variation. Changes in the environment and maintaining biodiversity. KS4 link: Interdependence between organisms. Evolution and natural selection. Pathogens and spreading diseases. Body's defence against a pathogen. Photosynthesis.
	Extra-curricular	University visits focused on healthcare careers, visits from meducators UK to deliver science/medical based workshops and 1 to 1 careers meetings to help pupils access subject specific work experience.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC,KNOWLEDGE	Module 2.1: Cell Structure - PAG 1.1 Using a microscope to study mitosis Module 2.2: Biological Molecules - PAG 9.3 Qualitative test for reducing sugars - PAG 5.2 Determine glucose concentration - PAG 6.1 Identifying amino acids using TLC - PAG 9.2 Qualitative test for lipids Module 2.3: Nucleic Acids	Module 2.4: Enzymes - PAG 4.1 The effect of substrate concentration on rate of reaction Module 2.6: Cell Division, Cell Diversity and Cell Differentiation	Module 3.1: Exchange Surfaces & Breathing	Module 4.1: Communicable Disease	Module 4.1: Communicable Disease	- PAG 12.1 Rate of Respiration of Saccharomyces
	Module 2.2: Biological Molecules - PAG 9.3 Qualitative test for reducing sugars - PAG 5.2 Determine glucose concentration - PAG 6.1 Identifying amino acids using TLC - PAG 9.2 Qualitative test for lipids Module 2.3: Nucleic Acids		Module 3.2: Transport in Animals - PAG 2.1 Dissection of mammalian heart Module 3.3: Transport in Plants	Module 4.2: Biodiversity - PAG 3.1 The calculation of species diversity - PAG 3.2 Measurement of the distribution and abundance of plants	Module 4.3: Classification & Evolution	
SPEC	The full specification list including individual learning outcomes can be found in section 2c: https://www.ocr.org.uk/Images/687834-download-a-level-specification.pdf					
SKILLS	The full skills list can be found here: https://www.ocr.org.uk/Images/687834-dwnload-a-level-specification.pdf Section 5c: How science works Section 5d: Mathematical requirements Section 5f: Practical endorsement skills					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning and use of cold calling • Practical assessments (PAG's) demonstrating skills surrounding the module.			Summative: • Baseline assessment in Autumn 1 • 2 Synoptic Live mark book assessments per term per staff member • 2x Module 2 mock exams during Autumn 2 • Breadth mock exam during Summer 2 (UCAS) • Depth mock exam during Summer 2 (UCAS) • Practical assessments (PAG's) completion and feedback of the extended tasks		
VOCAB	Electron micrograph, magnification, organelles,, resolution, graticule, condensation reaction, hydrogen bond, hydrolysis reaction, monomer, polymer, carbohydrates, glycosidic bond, lipids, phase, mobile phase, replication, diffusion, osmosis, water potential, active transport, endocytosis, exocytosis, cytokinesis, interphase, prophase,, guard cells, palisade cells, tissue, meristem,		alveoli, bronchi, bronchioles, diaphragm, intercostal muscles, trachea, ventilation, cartilage, ciliated epithelium, veins, venules, blood, hydrostatic pressure, lymph, oncotic pressure, plasma, tissue fluid, atrio-ventricular valves, ectopic heartbeat, electrocardiogram, fibrillation, myogenic muscle, Purkyne tissue, Sino-atrial node (SAN), tachycardia, affinity, dissociation, potometer, transpiration, adhesion, cohesion, hydrophyte		Pathogen, mycelium, hyphae, neutrophil, opsonins, antibodies, B memory cells, T regulator cells, agglutinins, anti-toxins, differentiation, clonal expansion, biodiversity, habitat, species, allele, gene variant, locus, polymorphic gene locus, Simpsons index of biodiversity, species evenness, species richness, climate change, wildlife reserves, conservation ex situ, CITES, correlation coefficient, standard deviation	

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CAREERS LINKS

- Biomedical scientist
- Genetic scientist
- Medical lab technician
- Veterinary science
- Dentistry
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- Nursing
- Clinical researcher

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SUPPORTING STUDENT'S AT HOME

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Students are also provided with A3 empty knowledge organiser sheets which are used to consolidate learning at the end of the topics.

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CURRICULUM AND ASSESSMENT PLAN

BIOLOGY

YEAR 13



INTENT

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Prior learning

KS4 link: Principles of nervous coordination and control in humans. The relationship between the structure and function of the human nervous system. Principles of hormonal coordination and control in humans. The process of photosynthesis. The importance of cellular respiration; the processes of aerobic and anaerobic respiration. Some abiotic and biotic factors which affect communities. The importance of interactions between organisms in a community. Sex determination in humans. Genetic variation in populations of a species. The process of natural selection leading to evolution. The role of microorganisms (decomposers) in the cycling of materials through an ecosystem.

KS5 link: Biological molecules (module 2), Transport in plants (module 3), Exchange surfaces (module 3), Transport in animals (module 3), Cell structure (module 2), Nucleotides and nucleic acids (module 2), Enzymes (module 2), Biodiversity (module 4), Classification and evolution (module 4)

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	Module 5.1: Communication & Homeostasis - PAG 11.2 Daphnia Heart Rate Response to Changes in Surrounding Medium Module 5.2: Excretion Module 5.3: Neuronal Communication Module 5.5: Plant & Animal Responses	Module 5.4: Hormonal Communications Module 5.6: Photosynthesis Module 5.7: Respiration	Module 6.1: Cellular Control Module 6.2: Patterns of Inheritance Module 6.4: Cloning & Biotechnology - PAG 10.3 Measuring pH change during yogurt production - PAG 7.1 The effect of antibiotics on microbial growth	Module 6.3: Manipulating Genomes Module 6.5: Ecosystems Module 6.6: Populations & Sustainability	Bespoke revision programme created by KS5 lead leading up to final June exams - Students cover all modules 2-6 in a series of booklets consisting of exam questions - Students also complete a perfect paper , walking talking mock for each module and topic led by an expert teacher.	
SPEC	The full specification list including individual learning outcomes can be found in section 2c: https://www.ocr.org.uk/Images/687834-download-a-level-specification.pdf					
SKILLS	The full skills list can be found here: https://www.ocr.org.uk/Images/687834-download-a-level-specification.pdf Section 5c: How science works Section 5d: Mathematical requirements Section 5f: Practical endorsement skills					
ASSESSMENT	Formative: • Live marking • Verbal feedback • 1,2,3 show me • Write, pair, share • Questioning and use of cold calling • Practical assessments (PAG's) demonstrating skills surrounding the module.		Summative: • 2 Synoptic Live mark book assessments per term per staff member • x2 Module 5 assessment during autumn 2 • Full A level mock exam during spring 2 - Biological processes - Biological diversity - Unified biology • Practical assessments (PAG's) completion and feedback of the extended tasks			
VOCAB	Homeostasis, negative feedback, positive feedback, cell signalling, osmoregulation, ADH (antidiuretic hormone), hypothalamus, pituitary gland, nephron, ultrafiltration, selective reabsorption, urine, kidney failure, dialysis, transplant, sensory receptors, action potential, myelinated neurone, synapse, neurotransmitter, summation, endocrine, hormones, pancreas, insulin, glucagon, diabetes (Type 1 and 2), adrenal gland, adrenaline, fight or flight, cerebrum, reflex arc, plant hormones, phototropism, stomatal closure, photosynthesis, chloroplast, thylakoid, grana, photosystems, light-dependent reaction, light-independent reaction (Calvin cycle), triose phosphate (TP), cellular respiration, mitochondria, glycolysis, Krebs cycle, oxidative phosphorylation, electron transport chain, anaerobic respiration.		Gene mutation, substitution, insertion, deletion, transcriptional control, post-transcriptional control, post-translational control, gene expression, body plans, apoptosis, mitosis, cell cycle, phenotypic variation, meiosis, fertilisation, genetic variation, autosomal linkage, sex linkage, epistasis, continuous variation, discontinuous variation, stabilising selection, directional selection, genetic drift, bottleneck effect, founder effect, speciation, reproductive isolation, artificial selection, selective breeding, wild type, DNA sequencing, synthetic biology, DNA profiling, PCR, electrophoresis, genetic engineering, gene therapy, somatic cell therapy, germ line therapy, micropropagation, tissue culture, embryo twinning, somatic cell nuclear transfer, biotechnology, fermentation, bioremediation, immobilised enzymes, succession, carbon cycle, nitrogen cycle, conservation, preservation.			

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CURRICULUM AND ASSESSMENT PLAN

CHEMISTRY

YEAR 12



INTENT

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↩	Prior learning	KS4 link: Acids and their reactions with metals, metal oxides, alkalis and carbonates. Knowledge of moles and Avogadro number. Calculating atom economy, percentage yields and theoretical yields. Knowledge of the meaning of the Activation energy. Ideas of how a system at equilibrium can be influenced by changes in conditions. Draw the structural formula for the first five straight chain alkanes and the first three-chain alkenes. Draw structural isomers of butane, pentane and butane.
♥	Extra-curricular	University visits focused on healthcare careers, visits from meducators UK to deliver science/medical based workshops and 1 to 1 careers meetings to help pupils access subject specific work experience.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC, KNOWLEDGE	Module 2.1: Atoms & Reactions - PAG 1.1 Determining the composition of copper (II) carbonate - PAG 2.1 determining the concentration of hydrochloric acid Module 2.2: Electrons, Bonding & Structure	Module 3.1: The Periodic Table Module 4.1: Basic Concepts & Hydrocarbons	Module 3.1: The Periodic Table - PAG 4.1 Identifying unknown ions Module 4.1: Basic Concepts & Hydrocarbons	Module 3.2: Physical Chemistry Module 4.2: Alcohols, Haloalkanes & Analysis	Module 3.2: Physical Chemistry - PAG 3.1 Determining enthalpy change of neutralisation Module 4.2: Alcohols, Haloalkanes & Analysis - PAG 5.1 Synthesis of a haloalkane	- PAG 12.1: Investigating Iron Tablets - PAG 6.1 synthesis of aspirin Module 5.1: Rates, equilibrium and pH change
SPEC	The full specification list including individual learning outcomes can be found in section 2c: https://www.ocr.org.uk/images/171720-specification-accredited-a-level-gce-chemistry-a-h432.pdf					
SKILLS	The full skills list can be found here: https://www.ocr.org.uk/images/171720-specification-accredited-a-level-gce-chemistry-a-h432.pdf Section 5d: How science works Section 5e: Mathematical requirements Section 5g: Practical endorsement skills					
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning and use of cold calling - Practical assessments (PAG's) demonstrating skills surrounding the module.			Summative: - Baseline assessment in Autumn 1 2 Synoptic Live mark book assessments per term per staff member 2x Module 2 mock exams during Autumn 2 - Breadth mock exam during Summer 2 (UCAS) - Depth mock exam during Summer 2 (UCAS) - Practical assessments (PAG's) completion and feedback of the extended tasks		
VOCAB	First ionisation energy, Electron shielding, Successive ionisation energies, Shell, Principal quantum number, Atomic orbital, Sub-shell, Electron configuration, Compound, Ionic Bond, Giant ionic lattice, Group, Covalent Bond, Lone pair, Dative Covalent Bond (Coordinate), Electronegativity, Permanent dipole, Polar covalent bond, Intermolecular Force, Permanent dipole-dipole, Hydrogen bond, Metallic bonding, Delocalised electrons, Giant Metallic lattice, Simple molecular lattice, Giant Molecular lattice		The periodic table, Atomic number, Period 2, Period 3, Metallic bonding, Ionisation energy, Melting point, Giant covalent lattice, Reactivity, Le Chatelier's principle, Disproportionation, Exothermic, Endothermic, Enthalpy profile, Activation energy, Standard conditions, Enthalpy change of reaction, Enthalpy change of combustion, Enthalpy change of formation, Enthalpy change of neutralisation, $q=mc\Delta T$, Average bond enthalpy, Hess's Law, Catalysts, Collision theory, Boltzmann distribution, Equilibrium		homologous series, functional group, hydrocarbons, alkyl, aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons, nomenclature, alkanes, saturated, unsaturated, general formula, structural formula, displayed formula, empirical formula, molecular formula, skeletal formula, alcohols, carboxylic acids, structural isomers, stereoisomers, isomerism, electron, homolytic fission, heterolytic fission, radicals, covalent bond, reaction mechanism, s-bond, orbitals, tetrahedral, bond angle, electron pair repulsion, boiling points, induced dipole-dipole, London forces, complete combustion, incomplete combustion, radical substitution, p-bond, catalyst, electrophile, electrophilic addition, carbocation, hydrogenation, halogenation, hydration, monomers, polymers, repeating unit, landfill, recycling, reusing, feedstock, biodegradable, non-biodegradable, photodegradable, bioplastic	

READING SKILLS

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CAREERS LINKS

- Analytical chemist
- Science teacher
- Medical lab technician
- Biochemist
- Dentistry
- Pharmacist
- Medicine
- Clinical researcher
- Drug analysis

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CURRICULUM AND ASSESSMENT PLAN

CHEMISTRY

YEAR 13



INTENT

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Prior learning

KS4 link: Rates of reactions and the factors affecting the rates of reaction. The role of a catalyst and how catalyst work in terms of lowering activations energy. Collision theory. Use of simple tangents to calculate the rate of a reaction at the start of a reaction. The study of exothermic and endothermic energy changes and bond energy calculations. Acids and alkalis and understanding the pH scale and what ions are involved in neutralisation. The difference between a dilute and concentrated solution, and how this affects the concentration of hydrogen ions. The study of bases, and how to prepare a salt using an alkali through titrations and making salts using bases.

KS5 link: How to calculate oxidation numbers and predict charges on ions. How to recognise and interpret redox reactions. How to determine enthalpy changes, including from experimental results $q = mc \times \text{change in } T$. The definitions of standard enthalpy changes. How to construct an enthalpy cycle using Hess's Law. how to determine oxidation states, acid base titrations and calculations, how to use VSEPR theory to determine shapes of molecules, how to determine the electronic structure of elements and ions using sub-shell notation, catalyst, Organic analysis using Mass spectrometry and infrared spectroscopy. Reactions of alkanes, alkenes and alcohols. Use of curly arrow mechanisms to represent reactions. Oxidation of alcohols using acidified potassium dichromate. Hydrogen bonding and the anomalous properties of water

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2	
TOPIC, KNOWLEDGE	Module 5.1: Rates, Equilibrium & pH - PAG 9.2 Rate of reaction of calcium carbonate and hydrochloric acid - PAG 10.2 Rates – Thiosulfate and acid - PAH 11.2 pH – Titration curves Module 6.1: Aromatic Compounds, Carbonyls & Acids	Module 5.2: Energy PAG 8.1 Electrochemical cells Module 6.2: Nitrogen Compounds, Polymers & Synthesis	Module 5.3: Transition Metals PAG 7.1 Identifying organic unknowns Module 6.3: Analysis	Module 5.3: Transition Metals PAG 7.1 Identifying organic unknowns Module 6.3: Analysis	Bespoke revision programme created by KS5 lead leading up to final June exams - Students cover all modules 2-6 in a series of booklets consisting of exam questions - Students also complete a perfect paper , walking talking mock for each module and topic led by an expert teacher.		
SPEC	The full specification list including individual learning outcomes can be found in section 2c: https://www.ocr.org.uk/images/171720-specification-accredited-a-level-gce-chemistry-a-h432.pdf						
SKILLS	The full skills list can be found here: https://www.ocr.org.uk/images/171720-specification-accredited-a-level-gce-chemistry-a-h432.pdf Section 5d: How science works Section 5e: Mathematical requirements Section 5g: Practical endorsement skills						
ASSESSMENT	Formative: - Live marking - Verbal feedback 1,2,3 show me - Write, pair, share - Questioning and use of cold calling - Practical assessments (PAG's) demonstrating skills surrounding the module.		Summative: 2 Synoptic Live mark book assessments per term per staff member - x2 Module 5,6 assessment during autumn 2 - Full A level mock exam during spring 2 - Periodic table, elements and physical chemistry - Synthesis and analytical techniques - Unified chemistry - Practical assessments (PAG's) completion and feedback of the extended tasks				
VOCAB	rate of reaction, order, rate constant, rate equation, overall order, concentration, time, half-life, reaction mechanism, rate-determining step, intermediate, Arrhenius, equilibrium law, homogenous equilibrium, heterogeneous equilibrium, mole fraction, partial pressure, temperature, Bronsted-Lowry acid, Bronsted-Lowry base, titration, neutralisation, alkalis, acid dissociation constant, pH, ionic product of water, buffers, indicators, equivalence point, end point, pH metre, lattice energy, lattice enthalpy, standard enthalpy of formation, first ionisation, endothermic, exothermic, standard enthalpy change of solution, standard enthalpy changes of hydration, standard conditions, ions, entropy, surroundings, system, standard entropy, standard entropy change of reaction, Gibbs free energy, free energy change, oxidation, reduction, oxidising agent, reducing agent, redox, standard electrode potential, half cell, half equation, complex, coordination number, bidentate, tridentate, multidentate, stereoisomers, cis-trans, optical isomers, ligand substitution, haemoglobin, precipitation, oxidation, reduction, redox, titrations, qualitative analysis, ions.			Directing effect, bromination, electrophile, electrophilic substitution, nitration, benzene, alkene, aromatic, phenol, delocalised, benzene, hydrogenation, substitution, benzene derivative, reflux, carcinogen, halogenation, Friedal-Crafts, haloalkane, acyl chloride, halogen carrier, catalyst, phenol, weak acid, carbonyl, oxidation, nucleophilic addition, carboxylic acid, solubility, ester, Amines, alkylammonium salt, alpha-amino acid, amide, chiral, optical isomer, polyamide, polyester, acid hydrolysis, alkaline hydrolysis, nitrile, nucleophilic substitution, reduction, alkylation, acylation, distillation, recrystallisation, synthetic routes, Stationary phase, mobile phase, TLC, retention time, R _f value, qualitative analysis, nuclear magnetic resonance, chemical shift, deuterium, spectra			

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