



"A tree planted by streams of water, which yields its fruit in season" (Psalm 1:3)
Wisdom – Hope – Service – Resilience



Curriculum Intent Statement

Department: Science

Intent:

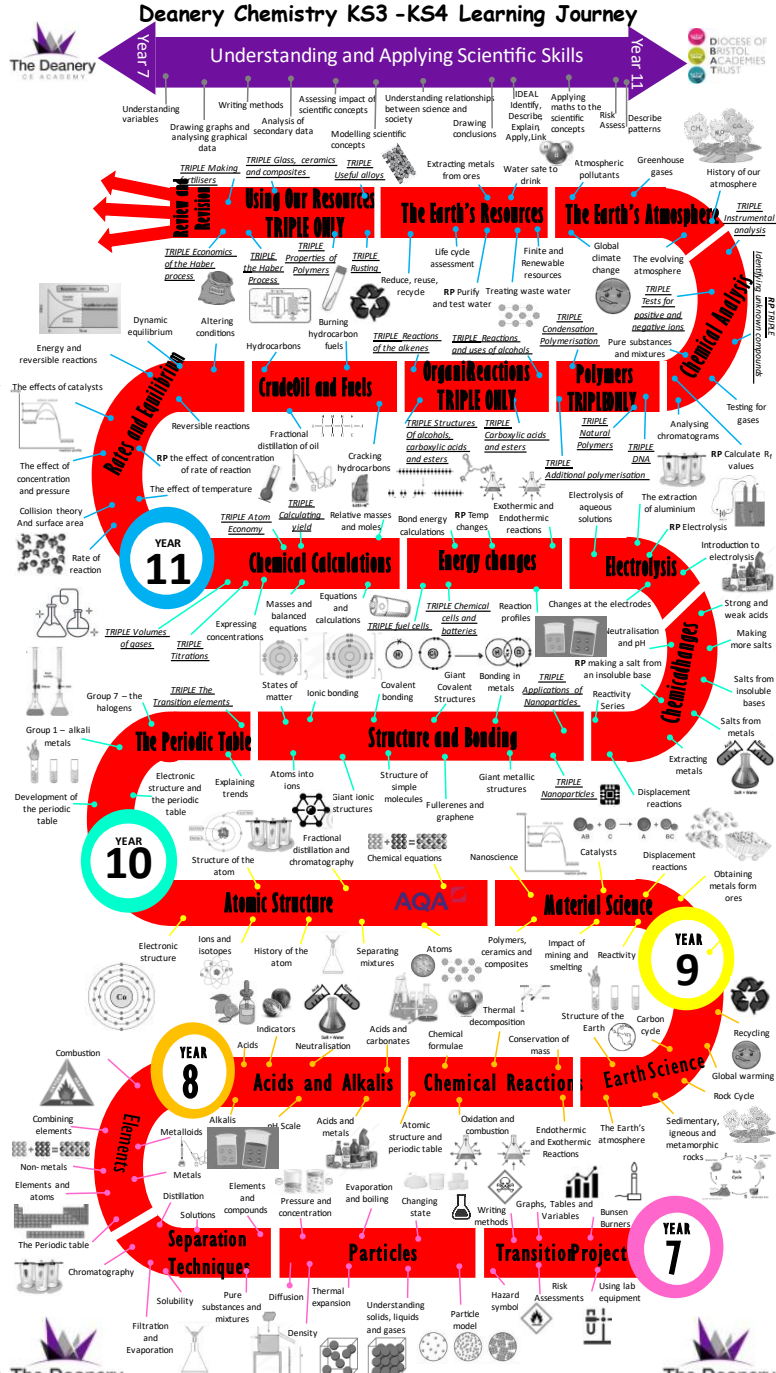
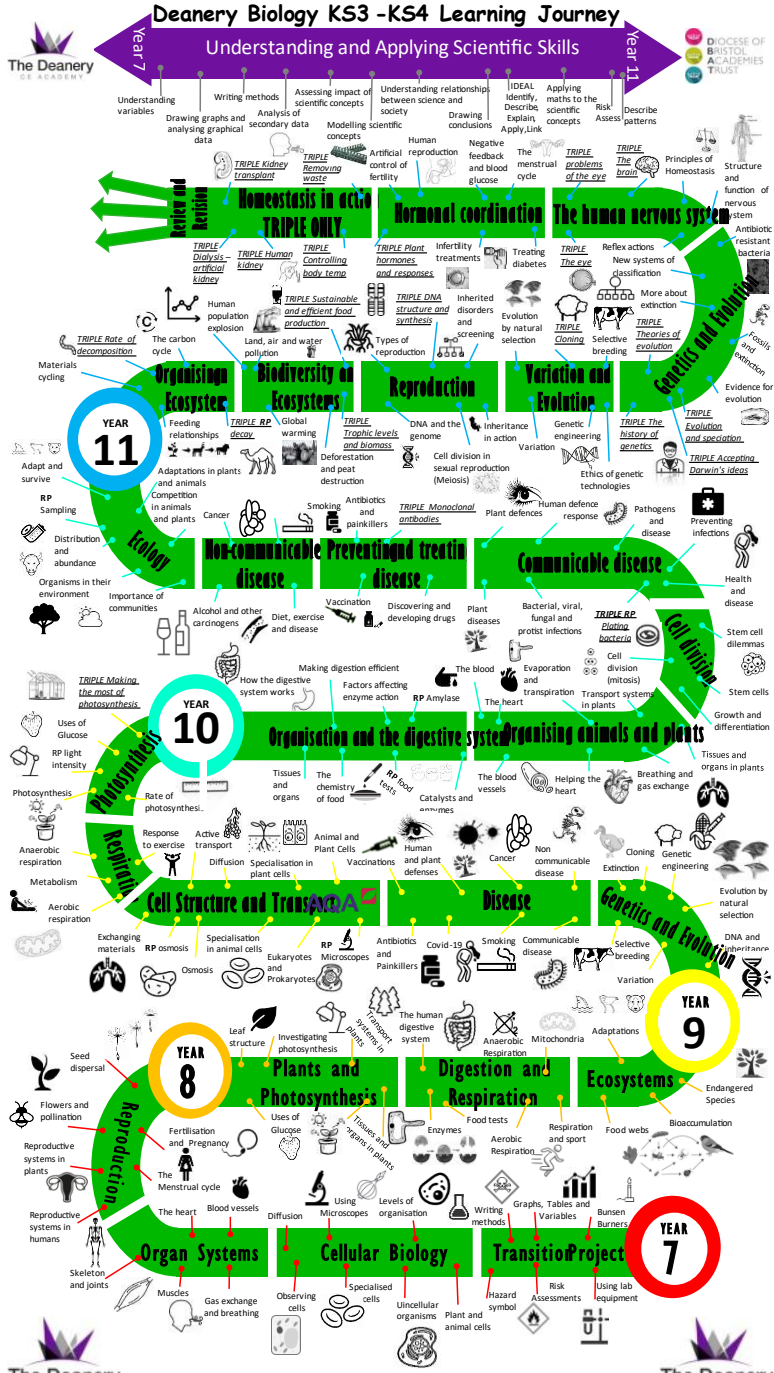
To provide a science education that enriches student's ambition and a love of learning within science and to equip them with the skills, knowledge and cultural capital they need to access aspirational post 16 pathways and careers as well as the responsibilities of later life through:

- Foster **wisdom** by promoting an understanding of how Science is part of our everyday lives
- Instil **hope** by providing opportunities to develop confidence and competence for future success.
- Emphasise **service** by ensuring a solid foundation for GCSE study and beyond, preparing students to contribute positively to society.
- Encourage **resilience** through challenging lessons that develop perseverance, curiosity, and a sense of achievement.

Our goal is to create scientifically literate learners who never stop asking questions whether it be through theory or practical lessons.

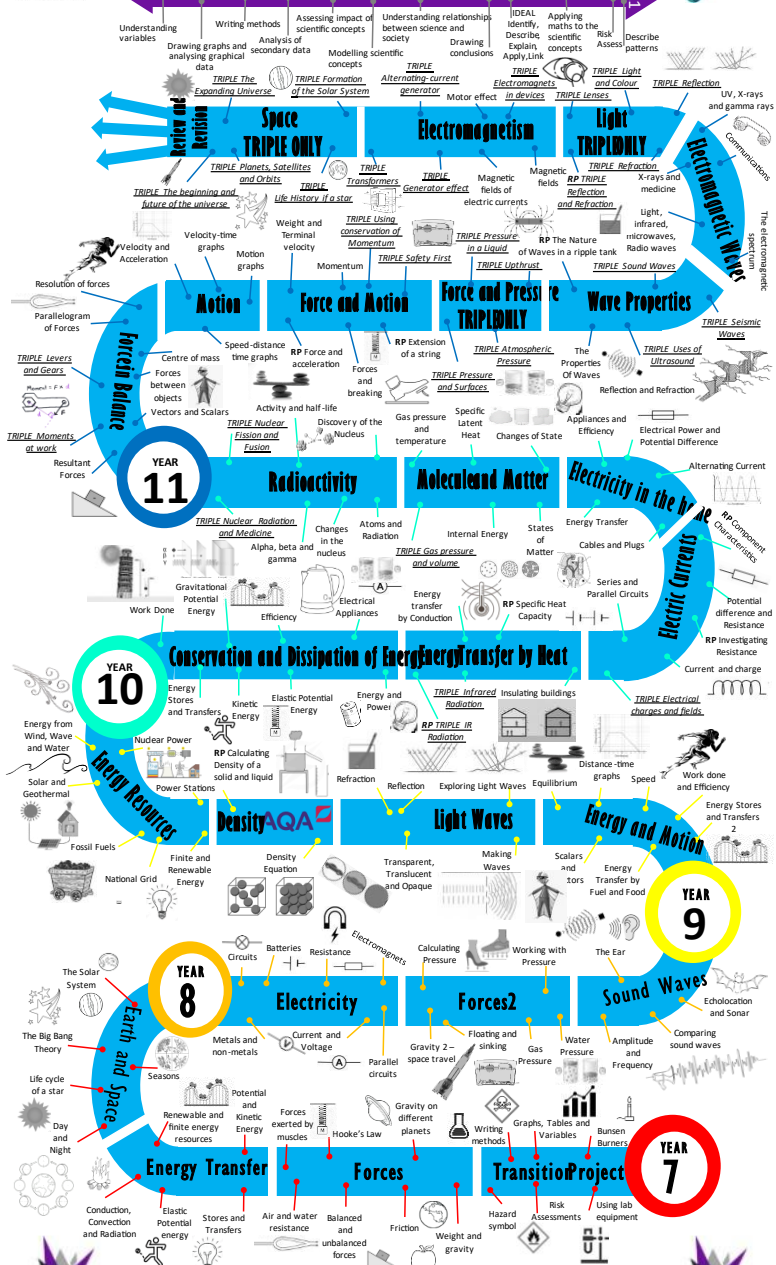
Albert Einstein Quote

"The important thing is not to stop questioning."



Deanery Physics KS3-KS4 Learning Journey

Understanding and Applying Scientific Skills



Year 7

Term	Unit of Work	Knowledge and Skills	Assessment
1	How Science Works	<ul style="list-style-type: none"> • Practical familiarisation of scientific equipment. • Identify, describe and explain hazchem symbols and link to evaluation of risk assessments. • Developing experimental skills, use of CIDER and ICE CREAM for types of variables, designing an investigation, presenting data and analysing data for a conclusion and evaluating this in terms of WWW and HTI. • Development of Numeracy skills in collaboration with the Maths Department 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
1	Cells	<ul style="list-style-type: none"> • Identify that cells are the building blocks of life and that they contain structures called organelles, which all have specific jobs. • Describe the human body has a highly organised set of body systems, organs, tissues and cells. • Explain how many cells, such as muscle cells and nerve cells, are specialised enabling them to carry out a specific task more effectively. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	Particles	<ul style="list-style-type: none"> • Relate features of the Particle model to the properties of materials in different states. Learn that the Particle model can help scientists to explain a range of observations. • Describe and Explain differences, in density, concentration and pressure using the particle model. • Explore diffusion. • Explain why physical changes are reversible and chemical changes are mostly irreversible. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	Forces	<ul style="list-style-type: none"> • Identify different forces, measure different forces, investigate and explore weight and gravity leading onto Hooke's Law – force/extension linear relationship. • Describe how forces can cause moving objects to change speed and direction and how elastic materials behave in a special way when a force changes their shape. • Describe and explain useful friction to motion in air & water – streamlining. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
3	Organ Systems	<ul style="list-style-type: none"> • Identify the key organs in the respiratory, digestive, skeletal and muscular systems. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

		<ul style="list-style-type: none"> Identify and describe the structure and function of the human skeleton to include support, protection, movement and making blood cells. 	
4	Separation Techniques	<ul style="list-style-type: none"> Identify substances which can dissolve, these are known as soluble and we can explain the process by thinking about the particles they are made up of. Identify and describe those mixtures can be separated by using simple techniques such as filtration, evaporation, distillation and chromatography. These processes can be used in everyday life. Identification of pure substances. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
4	Energy	<ul style="list-style-type: none"> Identify the energy stores and describe the 4 main energy transfers. Identify, describe and explain the use of energy sources and fuels. Describe those fuels are special chemicals that release thermal energy and that different fuels store and transfer different amounts of energy. Compare energy values of different foods Identify, describe and explain how conduction, convection and radiation are important ways of transferring energy. Such transfer leading to reduce the temperature difference: use of insulators and conductors. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
5	Reproduction	<ul style="list-style-type: none"> Identify, describe and explain male & female reproductive organs. Understand the events in the menstrual cycle and puberty. Fertilisation, gestation & birth. Identify, describe and explain how many factors affect the growth and development of the foetus, including the use of alcohol, cigarettes and drugs. Identify, describe and explain reproduction in plants, including flower structure, wind and insect pollination, fertilization, seed and fruit formation and dispersal. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
6	Elements	<ul style="list-style-type: none"> Identify, describe and explain how chemical models and symbols help us understand how chemical elements can join together in many different ways to produce an amazing range of different substances which we use in everyday life. Use of IDEALS for the Periodic Table – periods & groups; metals & non-metals and how patterns in reactions can be predicted with reference to the Periodic Table. Identify, describe and explain combustion and how this links to the Fire triangle. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

Year 8

Term	Unit of Work	Knowledge and Skills	Assessment
1	How Science Works	<ul style="list-style-type: none"> • Practical familiarisation of scientific equipment. • Identify, describe and explain hazchem symbols and link to evaluation of risk assessments. • Developing experimental skills, use of CIDER and ICE CREAM for types of variables, designing an investigation, presenting data and analysing data for a conclusion and evaluating this in terms of WWW and HTI. • Development of Numeracy skills in collaboration with the Maths Department. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
1	Acids & Alkalis	<ul style="list-style-type: none"> • Defining acids and alkalis in terms of neutralisation reactions and describe and explain how acids and alkalis are used in our everyday lives. • Describe and explain how the pH scale is a measure of acidity/alkalinity • Use of Indicators to show how acidic or alkaline a substance is. • Use of IDEALS for Acid & Metal reaction, Acid & Alkali reaction and Acid & Metal Carbonate reaction. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	Electricity	<ul style="list-style-type: none"> • Use IDEALS to understand and use electrical components in circuits and explore voltage current and resistance. Relate to everyday life. • Investigate properties of temporary magnets, permanent magnets and magnetism and link to understanding electromagnets. • Identify, describe and explain how electromagnets work and link to the knowledge that electromagnets can be switched on/off and thus used in motors and metal recycling plants. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
3	Photosynthesis	<ul style="list-style-type: none"> • Write the symbol and word equations for photosynthesis. Understand where photosynthesis happens in a plant. • Label the cross section of a leaf structure and explain how cell specialisation helps the leaf to photosynthesize. • Identify, describe and explain that some organisms contain no chlorophyll but are able to make their own food – Chemosynthesis. • Introduce respiration 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
3	Chemical Reactions	<ul style="list-style-type: none"> • Review Chemical Symbols and Models • Look at oxidation reactions – to include comparison of complete and incomplete combustion • Identify, describe and explain thermal decomposition. 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

		<ul style="list-style-type: none"> How to distinguish between endothermic and exothermic reactions on the basis of temperature change and link this to everyday uses 	
4	Forces 2	<ul style="list-style-type: none"> Review Forces and what they can do Using IDEALS know that Gravity is a non-contact force that acts between all masses. Using IDEALS look at the understanding of atmospheric pressure and pressure in liquids with links to floating and sinking. Equation $P = F/A$ 	<p>Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
4	Respiration & Digestion	<ul style="list-style-type: none"> Review cells, organ systems Identify, describe and explain what each type of food in a healthy diet does for us. Using IDEALS - How much energy we need and how much we get from different foods we eat. Identify, describe and explain consequences of imbalances in diet, including obesity, starvation and deficiency diseases. Identify, describe and explain the word and symbol equation for respiration Explain the purpose of respiration and compare aerobic and anaerobic respiration. Link aerobic respiration to muscle contraction and that stamina sports rely on this. Cross curricular link with PE. Link anaerobic respiration to everyday applications such as brewing and baking. 	<p>Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
5	Earth Science	<ul style="list-style-type: none"> Identify, describe and explain structure & composition of the Earth – collaboration with the geography department Identify, describe and explain the Rock cycle – igneous, sedimentary & metamorphic rocks – link to the rock cycle Using IDEALS - Earth – limited resources & efficacy of recycling. Understand the Carbon cycle & production of carbon dioxide by human activity and the impact on climate. 	<p>Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
6	Ecosystems	<ul style="list-style-type: none"> Using IDEALS all organisms are affected by the conditions in their environment and are dependent on one another and that human activity can have both positive and negative influences on the environment. Explore food chains, food webs and how they link to pyramids of numbers Identify, describe and explain adaptations of predator and prey relationships and the effects of toxins - bioaccumulation 	<p>Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
6	Waves	<ul style="list-style-type: none"> Identify, describe and explain key words and the nature and property of waves 	<p>Knowledge Organiser completion</p>

		<ul style="list-style-type: none"> Identify, describe and explain sound waves and the use of ultra sound Calculate the speed of sound using the equation and investigate sound in different mediums 	Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
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Year 9

Term	Unit of Work	Knowledge and Skills	Assessment
1	9.1 Genetics	<ul style="list-style-type: none"> Review structure of the cell and cell organelles Describe and explain inheritance, variation, selective breeding and cloning and extinction 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	9.2 Materials	<ul style="list-style-type: none"> Review Periodic table and reactivity of metals Identify, describe and explain ways to extract metals dependent on the Reactivity series – for example copper Identify, describe and explain the use of catalysts and give some examples related to everyday life Identify, describe and explain the nature, the properties and uses of polymers and ceramics 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2/3	9.3 Energy	<ul style="list-style-type: none"> Review - Identify, describe and explain how conduction, convection and radiation are important ways of transferring energy. Such transfer leading to reduce the temperature difference: use of insulators and conductors. Calculate work done and review units Identify scalar and vector quantities 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
3	9.4 Disease	<ul style="list-style-type: none"> Identify, describe and explain communicable and non-communicable diseases Discussion work on cancer Describe and explain the use of vaccines to alleviate pandemics such as Covid Identify, Describe and explain plant and human defences 	Knowledge Organiser completion Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
4	C1 Atomic Structure	<ul style="list-style-type: none"> Identify and name elements from their symbols Describe and explain what information can be obtained from the Periodic table Identify, describe and explain the structure of an atom and relate to the history of the atom Explain how mass is conserved during reactions 	

		<ul style="list-style-type: none"> Describe and explain the difference compounds and mixtures, including how mixtures can be separated Describe reactions using word equations Using IDEALS balance symbol equations 	
4	C2 Period Table	<ul style="list-style-type: none"> Identify key parts of the Periodic Table Describe in detail how the Periodic Table is arranged Explain in detail how new evidence led to the development of the Periodic Table Describe how the number of outer shell electrons is linked to the group number Identify, describe and explain reactions of Group 1 and 7 and link to reactivity changes Using IDEALS make the link between electronic structures, atomic radii and reactivity in group 1 and 7 Identify, describe, explain and compare transition metals with group 1 	Knowledge organiser completion C1 & C2 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
5	B1 Cells	<ul style="list-style-type: none"> Identify the features and functions of different prokaryote and eukaryote organisms. RP1 - Describe the method for calculating the real size of a cell using a microscope Explain the roles of osmosis, diffusion and active transport within cells RP2 - Link the role of osmosis to the results of the required practical in plant cells 	Knowledge Organise completion B1 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
5	P3 Energy Demands & P6 Density	<ul style="list-style-type: none"> Identify finite/non-renewable and renewable energy sources Describe and explain how current energy demands are met, including how electricity is generated and variable demand is met Suggest and explain how demand for energy can be met in the future Discuss the issues associated energy sources and the environment Define density and describe the factors that affect it. RP5 – Calculating Density of regular and irregular objects, including converting between units 	Knowledge Organise completion P3 & P6 density Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
6	B8 and B9 Bioenergetics	<ul style="list-style-type: none"> Identify the word and symbol equations for photosynthesis and respiration Compare aerobic and anaerobic respiration in different organisms Describe the limiting factors for photosynthesis and link to enzymes and rate of reaction 	Knowledge Organise completion B8 & B9 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

		<ul style="list-style-type: none"> RP6 - Explain the method for investigating the effects of different limiting factors on the rate of photosynthesis 	
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Year 10 – Combined Science: Trilogy Biology (3 lessons a fortnight)

Term	Unit of Work	Knowledge and Skills	Assessment
1	B3 Digestion B4 Organisation	<ul style="list-style-type: none"> Investigate the cardiovascular, digestive and breathing systems in the body; Analyse how our lifestyles effect our health; Apply knowledge to real life application 	Fortnightly exam question homework – formative assessment
2	B4 Organisation cont. B2 Stem Cells	<ul style="list-style-type: none"> Investigate the different tissues and organs within plants, analyse their functions and how these are affected by environmental change. Link the structure of cells to how they pass through the stages of the cell cycle; Evaluate the role of stem cells and the medical uses and ethics of embryonic stem cells. 	B2-B4 Knowledge organiser completion B2-B4 End of unit assessment (40- mark milestone) B2-B4 Milestone feedback for end of unit assessment.
3	B5 Communicable Disease B6 Treating disease	<ul style="list-style-type: none"> Analyse and evaluate how our body protects itself from infection; Illustrate and categorise pathogens and their effects Identify the uses of vaccines, antibiotics and painkillers and link to natural selection in pathogens leading to the requirement for new drugs to be produced. 	Fortnightly exam question homework – formative assessment
4	B7 Non-Communicable Disease B8-B9 Bioenergetics Reteach	<ul style="list-style-type: none"> Evaluate the risks of different life style choices in correlation to non-communicable disease. Describe and explain the processes of photosynthesis, aerobic and anaerobic respiration; analysing limiting factors and how the rates of these reactions can be influenced; reading and interpreting graphs 	B5-B7 Knowledge organiser completion B5-B7 End of unit assessment (40-mark milestone) B5-B7 Milestone feedback for end of unit assessment.
5	B16 Adaptations, Interdependence and Competition B1-B4 Reteach Revision	<ul style="list-style-type: none"> Investigate the effects of different biotic and abiotic factors on the survival of organisms in habitats, describe common adaptations to key habitat and how these help the survival of organisms. 	Fortnightly exam question homework – formative assessment
6	B5-B9 Reteach Revision B17 Organising an Ecosystem	<ul style="list-style-type: none"> Link biology units together to understand the synoptic connections, analyse exam questions to identify key words and language used in 	Biology Paper 1 Mock exam – exam conditions

		<p>mark schemes. Practice extended writing tasks for investigating required practicals.</p> <ul style="list-style-type: none"> • Model the processes which control the natural world; Sample life in our surroundings and evaluate how it is interlinked 	
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Year 11 – Combined Science: Trilogy Biology (3 lessons a fortnight)

Term	Unit of Work	Knowledge and Skills	Assessment
1	B16-B17 Recap B18 Biodiversity and Ecosystems B13 Types of Reproduction	<ul style="list-style-type: none"> • Analyse the impacts humans are having on the environment and explain how we can try to maintain biodiversity globally. • Compare asexual and sexual reproduction in different species, explain the process of inheritance and how this creates variation within a species, analyse genetic crosses to predict the genes inherited by offspring. 	B16-B18 Knowledge organiser completion B16-B18 End of unit assessment (40-mark milestone) B16-B18 Milestone feedback for end of unit assessment.
2	B14 Variation and Evolution B15 Genetics and Evolution	<ul style="list-style-type: none"> • Explain how the variation in organisms leads to evolution, analyse and compare different ways in which humans have manipulated the genes of animals and plants • Analyse evidence for natural selection and explain the process of and need for classification 	B13-B15 Knowledge organiser completion B13-B15 End of unit assessment (40-mark milestone) B13-B15 Milestone feedback for end of unit assessment. Biology Paper 2 Mock exam – exam conditions
3	B10 Human Nervous System B11 Endocrine system	<ul style="list-style-type: none"> • Explaining the role of the nervous system and the processes involved in a reflex. Investigating factors that affect reaction times. • Compare the responses of the nervous and endocrine systems • Analyse the response of negative feedback using blood glucose and diabetes as an example. 	B10-B11 Knowledge organiser completion B10-B11 End of unit assessment (40-mark milestone) B10-B11 Milestone feedback for end of unit assessment.
4	Revision	<ul style="list-style-type: none"> • Link biology units together to understand the synoptic connections 	Biology Paper 2 Mock exam – exam conditions
5	Revision	<ul style="list-style-type: none"> • Analyse exam questions to identify key words and language used in mark schemes. Practice extended writing tasks for investigating required practicals. 	

Year 10 – Separate Sciences: Biology (4 lessons a fortnight)

Term	Unit of Work	Knowledge and Skills	Assessment
1	B3 Digestion B4 Organisation	<ul style="list-style-type: none"> Investigate the cardiovascular, digestive and breathing systems in the body; Analyse how our lifestyles effect our health; Apply knowledge to real life application 	Fortnightly exam question homework – formative assessment
2	B4 Organisation cont. B2 Stem Cells B5 Communicable Disease	<ul style="list-style-type: none"> Investigate the different tissues and organs within plants, analyse their functions and how these are affected by environmental change. Link the structure of cells to how they pass through the stages of the cell cycle; Evaluate the role of stem cells and the medical uses and ethics of embryonic stem cells. Analyse and evaluate how our body protects itself from infection; Illustrate and categorise pathogens and their effects 	B2-B4 Knowledge organiser completion B2-B4 End of unit assessment (40-mark milestone) B2-B4 Milestone feedback for end of unit assessment.
3	B6 Treating disease B7 Non-Communicable Disease	<ul style="list-style-type: none"> Identify the uses of vaccines, antibiotics and painkillers and link to natural selection in pathogens leading to the requirement for new drugs to be produced. (Triple only) Investigating the uses and production of monoclonal antibodies Evaluate the risks of different life style choices in correlation to non-communicable disease. 	B5-B7 Knowledge organiser completion B5-B7 End of unit assessment (40-mark milestone) B5-B7 Milestone feedback for end of unit assessment.
4	B8-B9 Bioenergetics Reteach B16 Adaptations, Interdependence and Competition	<ul style="list-style-type: none"> Describe and explain the processes of photosynthesis, aerobic and anaerobic respiration; analysing limiting factors and how the rates of these reactions can be influenced; reading and interpreting graphs Investigate the effects of different biotic and abiotic factors on the survival of organisms in habitats, describe common adaptations to key habitat and how these help the survival of organisms. 	Biology paper 1 exam – in class mock exam
5	B17 Organising an Ecosystem B1-B4 Reteach Revision	<ul style="list-style-type: none"> Model the processes which control the natural world; Sample life in our surroundings and evaluate how it is interlinked Analyse exam questions to identify key words and language used in mark schemes. Practice extended writing tasks for investigating required practicals. 	
6	B5-B9 Reteach Revision B18 Biodiversity and Ecosystems	<ul style="list-style-type: none"> Link biology units together to understand the synoptic connections, Analyse the impacts humans are having on the environment and explain how we can try to maintain biodiversity globally. 	Biology Paper 1 Mock exam – exam conditions B16-B18 Knowledge organiser completion B16-B18 End of unit assessment (40-mark milestone)

			B16-B18 Milestone feedback for end of unit assessment.
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Year 11 – Separate Sciences: Biology (4 lessons a fortnight)

Term	Unit of Work	Knowledge and Skills	Assessment
1	B16-B18 Recap B13 Types of Reproduction	<ul style="list-style-type: none"> Analyse the impacts of humans on the environment to the adaptations vs extinction of different species. Compare asexual and sexual reproduction in different species at cellular and organism level (triple only), explain the process of inheritance and how this creates variation within a species, analyse genetic crosses to predict the genes inherited by offspring. 	Fortnightly exam question homework – formative assessment
2	B14 Variation and Evolution B15 Genetics and Evolution	<ul style="list-style-type: none"> Explain how the variation in organisms leads to evolution, analyse and compare different ways in which humans have manipulated the genes of animals and plants (Triple only) Analyse Mendel’s methods for discovering the process of inheritance, explain the process of speciation and compare the different theories of evolution Analyse evidence for natural selection and explain the process of and need for classification 	B13-B15 Knowledge organiser completion B13-B15 End of unit assessment (40-mark milestone) B13-B15 Milestone feedback for end of unit assessment. Biology Paper 2 Mock exam – exam conditions
3	B10 Human Nervous System B11 Endocrine system	<ul style="list-style-type: none"> Explaining the role of the nervous system and the processes involved in a reflex. Investigating factors that effect reaction times. Compare the responses of the nervous and endocrine systems Analyse the response of negative feedback using blood glucose and diabetes as an example. 	
4	B12 Homeostasis (Triple only)	<ul style="list-style-type: none"> Explain the importance of homeostasis for the body Compare homeostatic responses in hot and cold climates Analyse the role of the kidney in maintaining osmotic pressure within the body and explain how it produces waste. 	Biology Paper 2 Mock exam – exam conditions B10-B12 Knowledge organiser completion B10-B12 End of unit assessment (40-mark milestone) B10-B12 Milestone feedback for end of unit assessment.

5	Revision	<ul style="list-style-type: none"> Link biology units together to understand the synoptic connections, analyse exam questions to identify key words and language used in mark schemes. Practice extended writing tasks for investigating required practicals. 	
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Year 10: GCSE Specification AQA – Combined Science + Chemistry + Higher

Term	Unit of Work	Knowledge and Skills	Assessment
1	C3 Structure and Bonding	<ul style="list-style-type: none"> Identify and describe the 3 main types of bonding – metallic, ionic and covalent. Explain and link properties of materials to their bonding and structure Investigation – Use experimental results to identify bonding types present Continue your understanding of atoms to explore how atoms bond and interact to form the world around us – fullerenes, graphite and graphene Research theories, properties, and technology about materials and their structures – nanoparticles. Relate to surface area to volume ratio 	Fortnightly exam question homework – formative assessment Knowledge Organiser completion C3 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	C5 Chemical Changes	<ul style="list-style-type: none"> RP1 – Prepare a salt from an insoluble metal carbonate or oxide Use experimental results to identify the reactivity series of metals and link the reactivity series to reactions of metals including displacement Write word and symbol equations to represent reactions between metals and their compounds and acids Explain reactions in terms of oxidation and reduction - OILRIG Review work on pH scale and use IDEALS to link to neutralisation Identify, describe, explain and link hydrogen ion concentration to the numerical value of pH 	Knowledge Organiser completion C5 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
3	C6 Electrolysis	<ul style="list-style-type: none"> RP3 – Investigate the electrolysis of a solution Describe what happens to an ionic substance when it is electrolysed using an anode and cathode Explain what happens at the electrodes using the terms oxidation and reduction Predict using half equations what would happen when a substance is electrolysed 	
4	C7 Energy Changes	<ul style="list-style-type: none"> RP4 – Investigate temperature changes Identify, describe and explain endothermic and exothermic reactions from temperature changes and how useful they are 	Knowledge Organiser completion C6 & C7 Milestone WWW/HTI/MAC and feedback

		<ul style="list-style-type: none"> • Represent endo/exothermic reactions using energy profiles • Calculate bond enthalpy using displayed formula • Explain how a hydrogen fuel cell works and write half equations for chemical cells 	Student feedback on milestone/books
5	C4 Chemical Calculations	<ul style="list-style-type: none"> • Identify relative atomic mass from element symbols and calculate the relative formula mass of compounds • Identify and explain whether simple equations are balanced • Describe concentration – use equation and units • Describe the concept of the mole and calculate moles from masses • RP2 – Use titration to investigate reacting volumes • Calculate: Number of moles present in a solution – using titration results, percentage yield, atom economy, concentration, volumes of gases 	Knowledge Organiser completion C4 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
6	Chem – Revision C8 Rates of Reaction	<ul style="list-style-type: none"> • RP5 – Investigate the effect of concentration/temperature and catalysts on rate of reaction • Describe and explain factors (temperature, surface area, catalysts, concentration and pressure) which affect rate of reaction due to the collision theory • Calculate a mean rate of reaction using data and from graphs – tangents • Identify, describe and explain reversible reactions in terms of endo/exothermic • Use Le Chatelier's principle to explain how the composition of an equilibrium mixture can be altered by temperature and pressure. 	Chemistry Paper 1 Mock exam – exam conditions Knowledge Organiser completion C8 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

Year 11 GCSE Specification AQA – Combined Science + Chemistry + Higher

Term	Unit of Work	Knowledge and Skills	Assessment
1	C8 Rates of Reaction	<ul style="list-style-type: none"> • RP5 – Investigate the effect of concentration/temperature and catalysts on rate of reaction • Describe and explain factors (temperature, surface area, catalysts, concentration and pressure) which affect rate of reaction due to the collision theory • Calculate a mean rate of reaction using data and from graphs – tangents • Identify, describe and explain reversible reactions in terms of endo/exothermic • Use Le Chatelier's principle to explain how the composition of an equilibrium mixture can be altered by temperature and pressure. 	<p>Fortnightly exam question homework – formative assessment</p> <p>Knowledge Organiser completion</p> <p>C8 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
1	C9 Crude Oil	<ul style="list-style-type: none"> • Describe how crude oil is formed • Identify the first 4 alkanes and describe how alkanes can be distinguished from alkenes • Describe and explain how fractional distillation and cracking are carried out on an industrial scale and the importance • Review, Identify, describe and explain complete and incomplete combustion 	<p>Knowledge Organiser completion</p> <p>C9 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
2	C10 & C11 Organic Reactions & Polymers	<ul style="list-style-type: none"> • Identify alkenes, alcohols, carboxylic acids and ester functional groups • Describe and explain the and products of all the functional groups listed • Identify repeating units and monomers to given polymers – Polypeptides and proteins from amino acids • Compare addition and condensation polymerisation 	<p>Knowledge Organiser completion</p> <p>C9, C10 and C11 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books Chemistry Paper 2 Mock exam – exam conditions</p>
3	C12 Analysis	<ul style="list-style-type: none"> • RP6 – Calculate R_f values using paper chromatography • Describe how to test for common gases • RP7 – Use chemical tests to identify unknown compounds • Describe how to test for cations and anions and use ionic equations • Use IDEALS to interpret how flame emission spectroscopy is carried out • Evaluate the different analytical techniques 	<p>Knowledge Organiser completion</p> <p>C12 Milestone plus synoptic questions WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
3	C13 Earth's Atmosphere	<ul style="list-style-type: none"> • Identify, describe and explain how the atmosphere has changed from its early origins to the modern day • Identify, describe and explain how human influence may have led to changes in the Earth's atmosphere and climate 	<p>Knowledge Organiser completion</p> <p>C13 Milestone plus synoptic questions WWW/HTI/MAC and feedback Student feedback on milestone/books</p>

		<ul style="list-style-type: none"> Using IDEALS look at the importance of peer review of results and of communicating results to a wide range of audiences 	
3	C14 The Earth's Resources	<ul style="list-style-type: none"> Identify finite and renewable resources given appropriate information RP8 – Analyse and Purify water from different sources, including pH, dissolved solids and distillation Describe and explain how potable water can be obtained by passing freshwater through filter beds and using distillation Describe and explain how desalination can occur through reverse osmosis/distillation Describe and explain the different methods for extracting copper – bioleaching and Phyto mining while considering sustainability Interpretation of LCA – Life Cycle Assessments 	Knowledge Organiser completion C12 Milestone plus synoptic questions WWW/HTI/MAC and feedback Student feedback on milestone/books
4	C15 Using our Resources	<ul style="list-style-type: none"> Identify, describe and explain rusting and ways to prevent iron from rusting Identify and describe alloys and explain how varying the composition of alloys will affect their properties Use IDEALS to analyse why the HABER Process is economically important and the condition chosen to give acceptable yields whilst maintaining acceptable rates 	Knowledge Organiser completion C15 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books Chemistry Paper 2 Mock exam – exam conditions
5	Revision & Exams	<ul style="list-style-type: none"> Re-teach units and preparation for GCSE exams 	

Year 10: GCSE Specification AQA – Combined Science + **Physics + Higher**

Term	Unit of Work	Knowledge and Skills	Assessment
1	P1 Energy Resources	<ul style="list-style-type: none"> Identify, describe and explain processes in terms of energy stores and pathways and conservation of energy Calculate, change the subject gravitational potential energy, kinetic energy, elastic potential energy, work done, power and efficiency. Describe the difference between efficient and inefficient devices in terms of dissipation Describe and explain how to choose an electrical appliance for a particular job 	Fortnightly exam question homework – formative assessment
1	P2 Energy Transfer by heating	<ul style="list-style-type: none"> RP1 – Determining Specific heat capacity Calculate specific heat capacity and apply knowledge of specific heat capacity to make predictions RP2 – Investigating thermal insulators and relate to heating and insulating buildings Describe what thermal conductivity means and calculate changes in thermal energy Using IDEALS look at how the greenhouse effect is affecting the temperature of the Earth in terms of radiation 	Knowledge Organiser completion P1 & P2 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	P4 Electric Circuits	<ul style="list-style-type: none"> Describe, explain and apply information about static electricity in terms of electron movement and uses in everyday life Identify components by their symbols Calculate resistance, potential difference and current and total resistance in series RP3 – Investigating resistance in a wire and resistors in series and parallel RP4 – Investigate electrical components – wire, light bulb and LED and apply to OHMS Law 	
3	P5 Electricity in the Home	<ul style="list-style-type: none"> Describe and explain the purpose of fuses, earthing, circuit breakers and plastic casings in electrical safety. Calculate power, charge flow, energy transferred from the mains and efficiency. 	Knowledge Organiser completion P4 & P5 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books

		<ul style="list-style-type: none"> • Calculate peak potential difference and frequency from measurements of a trace on an oscilloscope screen • Rewire a plug • Describe and explain the National Grid 	
4	P6 Molecules and Matter	<ul style="list-style-type: none"> • Identify, describe and explain arrangement of particles in a solid, liquid and gas and their properties • Identify, describe and explain the effect of specific latent heat on the change of state of a liquid – use the equation • Describe and explain what happens when you increase the temperature or decrease the volume of a gas • Describe, explain and apply the relationship between pressure and volume of a gas 	
5	P7 Radioactivity	<ul style="list-style-type: none"> • Describe and explain structure of the nucleus and how the model has changed over time. • Identify, describe and explain alpha, beta and gamma radiation and their different properties • Use IDEALS to balance nuclear radiation • Identify and describe half-life. Use a graph to determine half-life and calculate net decline. • Describe and explain nuclear fusion and fission and the use of nuclear radiation in medicine 	<p>Knowledge Organiser completion</p> <p>P6 & P7 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
6	Physics Revision P8 Forces in Balance	<ul style="list-style-type: none"> • Identify, describe and explain vectors and scalar quantities • Review forces • Describe and explain Newtons first and third law about forces • Calculate resultant forces • State how the centre of mass is linked to stability • Identify, describe and explain levers and gears and calculate moments • Use Free body force diagrams to work out resultant force • Use the parallelogram of forces to find a resultant force and use a force diagram to work out whether an object is in equilibrium 	Physics Paper 1 Mock exam – exam conditions

Year 11 GCSE Specification AQA – Combined Science + **Physics + Higher**

Term	Unit of Work	Knowledge and Skills	Assessment
1	P8 Forces in Balance	<ul style="list-style-type: none"> Identify, describe and explain vectors and scalar quantities Review forces Describe and explain Newtons first and third law about forces Calculate resultant forces State how the centre of mass is linked to stability Identify, describe and explain levers and gears and calculate moments Use Free body force diagrams to work out resultant force Use the parallelogram of forces to find a resultant force and use a force diagram to work out whether an object is in equilibrium 	Fortnightly exam question homework – formative assessment
1	P9 Motion	<ul style="list-style-type: none"> Calculate speed, acceleration, deceleration, velocity Plot and interpret a distance time graph and a velocity time graph Calculate distance using a velocity time graph Calculate acceleration using tangents drawn to a curve on a velocity time graph 	Knowledge Organiser completion P8 & P9 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
2	P10 Force and Motion	<ul style="list-style-type: none"> Describe and explain the effect of force and mass on acceleration and inertia RP6 – Investigate the relationship between force and acceleration Describe and explain terminal velocity State, describe and explain factors that affect stopping distance Calculate momentum and apply the conservation of momentum to two objects when they collide Identify, describe and explain car, road and playground safety features RP7 – Investigate the relationship between force and extension for a spring Describe, explain and explain the behaviour of elastic materials 	Knowledge Organiser completion P8 – P10 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books Physics Paper 2 Mock exam – exam conditions
3	P11 Force and Pressure	<ul style="list-style-type: none"> Calculate pressure and explain in terms of force why the atmosphere exerts a force Explain how and why atmosphere changes with height Describe and explain how and why the pressure in a fluid is related to depth and density supported by pressure = height x density x gravity Investigate upthrust and link back to density 	Knowledge Organiser completion P11 Milestone plus synoptic questions - optional WWW/HTI/MAC and feedback Student feedback on milestone/books

3	P12 Wave Properties	<ul style="list-style-type: none"> • Identify, describe and explain the nature and properties of waves • Use and rearrange the wave equation • Describe and explain why waves are reflected and refracted and their behaviour at boundaries • RP8 – Investigate plane waves in a ripple tank and investigate waves on a stretched string • Describe and explain sound waves to include the ear and echo sounding • Describe and explain how ultrasound can be used to detect structures we cannot see • Describe and explain how seismic waves have given scientists information about the internal structure of the Earth and to detect structures we cannot see 	
3	P13 Electromagnetic Spectrum	<ul style="list-style-type: none"> • Identify the electromagnetic spectrum, some of their uses and dangers and calculate their frequencies and wavelengths • Describe some sources and detectors of electromagnetic waves and link them to their uses and dangers • Compare the ways that we image the body with how we treat the body in terms of electromagnetic radiation • RP9 – Investigate infra-red radiation • Describe and explain the use of signals and carrier waves in communications 	<p>Knowledge Organiser completion</p> <p>P12 – P13 Milestone plus synoptic questions WWW/HTI/MAC and feedback Student feedback on milestone/books</p>
4	P14 Light	<ul style="list-style-type: none"> • RP10 – Investigate reflection and Refraction of light • State the law of reflection • Describe and explain how light is refracted in a variety of contexts • Identify, describe and explain what filters do and the appearance of coloured objects in coloured light • Describe, explain and apply your knowledge of convex and concave lenses to analyse data from an experiment to everyday situations 	<p>Knowledge Organiser completion</p> <p>P12 - 14 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books</p> <p>Physics Paper 2 Mock exam – exam conditions</p>
4	P15 Electromagnetism	<ul style="list-style-type: none"> • Describe and explain how to investigate the shape of magnetic fields to explain why magnets attract or repel • Describe and explain what affects the magnetic field pattern near a wire and the strength of a solenoid and an electromagnet • Describe and explain how devices that use electromagnets work 	<p>Knowledge Organiser completion</p> <p>P15 Milestone P15 Milestone WWW/HTI/MAC and feedback</p>

		<ul style="list-style-type: none"> • Explain the motor effect • Explain how motors, generators, loudspeakers and microphones work 	Student feedback on milestone/books
4	P16 Space	<ul style="list-style-type: none"> • State, describe and explain how the solar system was formed • Describe and explain the lifecycle of the Sun and more massive stars • Describe and explain how gravity keeps objects in orbit • Explain the link between the force of gravity, the speed of an object in orbit and the radius of an orbit • Describe and explain evidence for the Big Bang and evaluate models of the Universe 	Knowledge Organiser completion P15 & P16 Milestone WWW/HTI/MAC and feedback Student feedback on milestone/books
5	Revision & Exams	<ul style="list-style-type: none"> • Re-teach units but consider class 	