

The Curriculum Journey – Key stage 3

Know more and remember more. Our scheme of work is based around three distinct disciplines: biology, chemistry, and physics. The scheme of work is ambitious as it attempts to connect science as a subject to the natural world around them. We offer the chance for pupils to understand living matter and how all-living organisms interact, the particulate model to understand how particles behave, energy and the importance of using it wisely and how particles interact in advantageous and disadvantageous ways. We have structured our scheme of work so that pupils of all abilities have the chance to study key concepts at depth before moving on to more challenging content. Our scheme of work is designed to link new subject content to previously taught key concepts. This allows pupils to develop their understanding of the key concepts by recalling, and adding to, their existing schema.

Understand the methodology of science: Pupils will begin to understand that nature and processes of science. We start by actively encouraging inquisitive thought and seek to engage pupils by getting them to ask scientific questions about the world around them. The scheme of work then offers the chance to learn about how we begin to answer the questions asked through observation, testing and evaluation. Pupils will develop key practical skills that are interwoven within a well sequenced curriculum.

Be able to use science for future life: In today's modern world there are numerous articles using 'data' to back a particular agenda. This comes from multiple sources, some to be trusted and some to be questioned. Pupils will have the ability to critically evaluate evidence and have the confidence to have conviction in their understanding of the data provided. Pupils will have the ability to articulate scientific thought and the ability to solve problems through logical thought process. This will allow pupils to make informed choices throughout the rest of their lives.

Curriculum sequencing: The science curriculum typically delves deeper into specific areas of study that are Key concepts, this provides a more detailed exploration and deeper understanding of 'Big Ideas in Science', compared to the broader scope of the NC. Our sequencing and content are influenced on BEST* and their key concepts in science. We have derived this schema from planning forward across the keys stage 1,2,3 and 4 programmes of study to ensure coverage, depth, and breadth of the science curricula.

* [Links to prior learning and embedding foundations for future learning.](#) *[Links to National curriculum coverage](#)

* [Links to BEST](#)

Year 7	Ht1	Ht2	Ht3	Ht4	Ht5	Ht6
Topic	Energy	Forces		Particles and structure	Acid and alkali	
Learning question	What is energy?	What are the effects of forces?		What is the difference between an element and compound?	What is the difference between acids and alkalis?	
Key schema- What is delivered?	<p>That energy can be transferred between stores in several different mechanisms.</p> <ul style="list-style-type: none"> -Stores -Pathways -Dissipation -Law of conservation of energy -Closed systems - Energy is quantitative rather than a substance. -Link to real word; we store money in our pockets- analogy of money -Energy from food <p>When systems change in either; motion, position or temperature its energy changes and we can calculate the amount of change.</p>	<p>Balanced forces</p> <ul style="list-style-type: none"> -Contact and non-contact - Speed, distance time graphs - Effects of forces -Conversions between Newtons and Kilograms -Extension of a spring*Year 8 -Links between forces and energy* 	<p>KaST</p> <p>Revision</p> <p>Preparation</p> <p>Marking</p> <p>Summative assessment, feedback and reporting.</p>	<ul style="list-style-type: none"> - the varying physical and chemical properties of different elements -The difference between elements, mixtures, compounds -Introduction into elemental symbols -The structure of the periodic table -Properties and links -States of elements* -Graph drawing* -Conducting exploratory investigations* 	<ul style="list-style-type: none"> -Using pH scale -Neutralisation -Everyday examples of acids and alkali's -Bases -Acid and alkali produce salt + water -Reactions of metals and acids -Chemical formula* -Chemical reactions* 	<p>KaST</p> <p>Revision</p> <p>Preparation</p> <p>Marking</p> <p>Summative assessment, feedback and reporting.</p>

<p>Why is this being taught now?</p>	<p>This topic builds upon knowledge gained in the KS2 curriculum about electrical devices and the concepts of conductors and insulators. This topic also directly relates to the other topics taught in year 7. An understanding of energy is necessary for all physics and some biology topics in the remainder of KS3 through to KS4. It is necessary to understanding all chemical reactions including photosynthesis and respiration.</p>	<p>This topic builds upon the knowledge gained in KS2 about how objects move on different surfaces and how forces can act over distances. This topic builds upon Ht1– energy and provides the necessary groundwork for topics including 8PL -light and space, 9PF – forces and motion and KS4.</p>		<p>This topic builds on the knowledge of solids, liquids and gases taught in the KS2 curriculum This topic enables students to access the chemical reactions topic later in year 7 and the periodic table topic which follows in year 7 and year 8. Undertaking distillation allows students to identify hazards and risks and to suggest appropriate safety precautions.</p>	<p>Undertaking making and using indicators alongside other important class investigations allows students to identify hazards and risks and to suggest appropriate safety precautions.</p>	
<p>Where Programme of study is met</p>	<p>National curriculum coverage: -energy changes on changes of state (qualitative) -comparing energy values of different foods (from labels) (kJ) metabolism of food, burning fuels. -energy as a quantity that can be quantified and calculated; the</p>	<p>National curriculum coverage: -Laws of motion forces as pushes or pulls, arising from the interaction between two objects -using force arrows in diagrams, adding forces in one dimension and balanced forces -</p>		<p>National curriculum coverage: -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</p>	<p>National curriculum coverage: -defining acids and alkalis in terms of neutralisation reactions - the pH scale for measuring acidity/alkalinity; and indicators -Reactions of acids with metals to</p>	

	total energy has the same value before and after a change	<ul style="list-style-type: none"> -forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, -forces measured in newtons, -other processes that involve energy transfer: changing motion, dropping an object, -non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity -forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) -change depending on direction of force and its size. 		<p>reference to the Periodic Table</p> <ul style="list-style-type: none"> -the properties of metals and non-metals - the chemical properties of metal and non-metal oxides with respect to acidity. - Comparison of elements, mixtures and compounds - Elemental symbols and names -Classification of elements based upon properties* 	<p>produce a salt plus hydrogen</p> <ul style="list-style-type: none"> - reactions of acids with alkalis to produce a salt plus water* - what catalysts do* 	
Pitstop assessment	Formative assessment and feedback	Formative assessment and feedback		Formative assessment and feedback	Formative assessment and feedback	

<p>Links to Ks2 National curriculum</p>	<p>Key stage 2 links: Year 2: Plant and animal growth Year 3: light, food chains, Year 4: sound, Electricity Year 5: Living things Year 6: Light and electricity</p>	<p>Year 3 -compare how things move on different surfaces -notice that some forces need contact between two objects, but magnetic forces can act at a distance -observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials -describe magnets as having two poles - predict whether two magnets will attract or repel each other, depending on which poles are facing</p>		<p>Year 4 -Compare and group materials together, according to whether they are solids, liquids or gases -observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) -identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Year 5: Changes in materials; groups and hardness, new materials</p>	
<p>Building schema- Why is this important?</p>	<p>Animals get their energy from plants and other animals.</p> <p>The big idea of energy as a conserved, quantitative property of a changing system</p>	<p>Forces are a fundamental part of the physics curriculum. As a method for energy transfer pupils can relate the action of forces directly to the</p>		<p>Particles are foundational concept which will provide the basis of many scientific concepts in all areas. This topic is also a good opportunity to</p>	<p>Using simple indicators and neutralisation as a further common chemical reaction.</p> <p>Key concept #4 Neutralisation</p>	

	<p>is a key curriculum link underlining many Science topics.</p> <p>Energy is a fundamental principle in science and interleaves between all topics and areas of specialisms. This topic builds upon knowledge gained in the KS2 curriculum about electrical devices and the concepts of conductors and insulators. This topic also directly relates to the other topics taught in year 7. An understanding of energy is necessary for all physics topics in the remainder of KS3 through to KS4. It is necessary to understanding all chemical reactions including photosynthesis and respiration.</p>	<p>changes that occur in the motion of objects. The topic introduces several key equations which will continue to be used into KS4</p> <p>Working scientifically skills include planning an investigation, presenting data in a variety of formats and plotting line graphs and calculating gradients.</p> <p><u>Key concept #2</u> <u>Describing forces</u></p> <p><u>Key concept #3</u> <u>Balanced and unbalanced forces</u></p> <p><u>Key concept #4</u> <u>Friction</u></p>		<p>introduce the idea of a model to explain observations and how ideas change over time. The rest of the unit allows students to apply the model to a range of situations and demonstrate its effectiveness at explaining macro and microscopic properties of matter.</p> <p><u>Key concept #2</u> <u>Particles in solution</u> <u>Key concepts #2</u> <u>Symbols and formulae</u></p>		
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Second part of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term
Topic	Matter and changing state	Cells	Human systems- Organ system and skeletal	Chemical reactions	Electricity	Interdependence
Learning question	What are particles how they behave?	What are the differences between cells?	How are organisms organised?	How do we know a chemical reaction has taken place?	What is an electric current?	How do organisms depend on each other?
Key schema What is delivered?	<p>Sc1 Recording and observing the effect of increasing temperature.</p> <p>Changing state</p> <ul style="list-style-type: none"> -Melting points -Boiling points -Kinetic energy* Thermal energy* Energy transfer* 	<ul style="list-style-type: none"> -Function and adaptations -Specialised cells -Comparison of cells from both plant and animal -Microscope -Tissues and organs -Specialised cells -Uni and multi cellular organisms -Diffusion* -Transfer of energy in cells* -Store of energy in cells* -Bioenergetics* -Drawing conclusions* 	<p>Structure of cells, movement of substances. *</p> <ul style="list-style-type: none"> -Diffusion -How the muscular and skeletal systems interact. -Organ systems -Dissections -Single and multicellular organisms 	<ul style="list-style-type: none"> Endothermic * Exothermic * -Physical and chemical changes -Recognising reactions Elements, mixtures, and compounds* Changes of state* Conservation of mass* Mass* Energy stored within bonds* 	<ul style="list-style-type: none"> -Parallel circuits -Series circuit -Resistance -Components Voltages and current * Calculations* Graph drawing* Analysis and conclusions* Energy transfers* 	<ul style="list-style-type: none"> - Food chains and Webs - Disruption of food chain and webs - Ecosystems - Competition -Interdependence Transfer of energy*
Where Programme of study is met	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> - the properties of the different states of matter (solid, liquid 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -cells as the fundamental unit of living organisms, 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> - the hierarchical organisation of multicellular 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -chemical reactions as the rearrangement of atoms -Representing 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -electric current, measured in amperes, in circuits, series and 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -the interdependence of organisms in an ecosystem, including

	<p>and gas) in terms of the particle model, including gas pressure</p> <ul style="list-style-type: none"> - changes of state in terms of the particle model. - conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving - similarities and differences, including density differences, between solids, liquids and gases - Brownian motion in gases - diffusion in liquids and gases driven by differences in concentration 	<p>including how to observe, interpret and record cell structure using a light microscope</p> <ul style="list-style-type: none"> - the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts - the similarities and differences between plant and animal cells - the role of diffusion in the movement of materials in and between cells - the structural adaptations of some unicellular organisms 	<p>organisms: from cells to tissues to organs to systems to organisms.</p> <ul style="list-style-type: none"> - the structure and functions of the human skeleton, to include support, protection, movement and making blood cells - biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles - the function of muscles and examples of antagonistic muscles. 	<p>chemical reactions using formulae and using equations</p> <ul style="list-style-type: none"> - combustion, thermal decomposition, oxidation and displacement reactions - the difference between chemical and physical changes 	<p>parallel circuits, currents add where branches meet and current as flow of charge</p> <ul style="list-style-type: none"> - potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current - differences in resistance between conducting and insulating components (quantitative) - completing an electrical circuit 	<p>food webs and insect pollinated crops</p> <ul style="list-style-type: none"> - how organisms affect, and are affected by, their environment, including the accumulation of toxic materials
<p>Why is this being taught now?</p>	<p>This topic builds on the knowledge of solids, liquids and gases taught in the KS2 curriculum. This topic enables students to access the chemical reactions topic later in year 7 and the periodic table topic</p>	<p>This topic builds on the students' knowledge of systems from the digestion topic in the KS2 curriculum. This topic enables students to access the reproductive topic in year 8 and the digestion and</p>	<p>This unit pulls together the previous learning of organisational hierarchy and introduces the function of different organ systems.</p> <p>Students will then focus on the skeletal</p>	<p>This unit provides knowledge on chemical change and evidence of a chemical reaction. The topic introduces several general word equation for reactions students will continue to investigate throughout KS 3 and</p>	<p>This topic builds upon knowledge gained in KS2 regarding electrical appliances and building simple circuits. This topic builds upon the topic 7PE -energy. This topic lays the groundwork for the</p>	<p>The Ecology topic will enrich student's knowledge of the world and will develop ideas of the interdependence between people and nature that is vital for food production, maintaining clean air and water, and</p>

	<p>which follows in year 8.</p>	<p>nutrition topic which follows in year 8.</p> <p>The microscope develops how to follow a scientific method which is essential to all practical work and introduces of mathematical formulas.</p>	<p>and muscular systems involved in movement as well as studying the heart.</p> <p>Students will then examine the respiratory system in year 9, looking at the mechanism of breathing, lung volumes and the role of diffusion in gas exchange. The impacts of This topic builds on work at Key Stage 2 Identify that some animals, including humans, have skeletons for support, movement and protection. This topic bridges the gap between KS 3 and KS 4 by providing further knowledge on the relationship between cells, tissues and organs; and describe the function of the main organ systems; and describe the structure of the gas exchange system in humans.</p>	<p>4. It provides opportunity to use particle diagrams to support the idea of the conservation of mass, which is introduced in lesson 1 and simple calculations show that mass in = mass out.</p> <p>The learning then moves onto acids and alkalis, using simple indicators and neutralization as a further common chemical reaction.</p>	<p>electricity topic studied in KS4</p>	<p>sustaining biodiversity in a changing climate.</p>
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			<p>Students will be able to:</p> <ul style="list-style-type: none">• Identify major muscle groups involved in common movements and describe how some of the muscular tissue in our organs work• Measure the force of some of the skeletal muscles in the body• Describe the function of the structures in the respiratory system using knowledge of diffusion, how gases are absorbed from the alveoli into the blood stream and explain how alveoli are adapted for their function involved in breathing and compare lung volumes in boys and girls• Calculate means and identify the range in data collected• Describe and explain the effects of exercise on the respiratory system			
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			<ul style="list-style-type: none"> • Compare aerobic and anaerobic respiration • Describe the effects of cigarettes on the tissues of the lungs and drugs and exercise on the respiratory and other systems will be explored. <p>The structure and function of DNA leads to the work of key scientists and a model for inheritance and will be covered in yr 9.</p>			
Assessment	Formative assessment and feedback. Overarching summative assessment.	Formative assessment and feedback. Overarching summative assessment.	RaP summative assessment and completion of RAP sheet	Formative assessment and feedback. Overarching summative assessment.	Formative assessment and feedback. Overarching summative assessment.	RaP summative assessment and completion of RAP sheet
Links to Ks2 National curriculum	Year 4 -compare and group materials together, according to whether they are solids, liquids or gases -observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in	Year 6 -describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals	Year 6 - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood -recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Year 5 - demonstrate that dissolving, mixing and changes of state are reversible changes - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with	Year 4: -identify common appliances that run on electricity -construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers -identify whether or not a lamp will light in	Year 2 identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other -identify and name a

	<p>degrees Celsius (°C)</p> <p>-identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Key stage 2 links: Year 2: Plant and animal growth Year 3: light, food chains, Year 4: sound, Electricity Year 5: Living things Year 6: Light and electricity</p>	<p>-give reasons for classifying plants and animals based on specific characteristics.</p> <p>Key stage 2 links: Year 2: Materials and their properties Year 3: Forces and states of matter Year 5: Changes in materials and reversible changes</p>	<p>-describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Key stage 2 links: Year 3: Animals; skeletal and nutrition. Year 4: Digestion Year 5: Living things. Year 6: How to keep the body healthy.</p>	<p>burning and the action of acid on bicarbonate of soda.</p> <p>-know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Key stage 2 links: Year 2- Materials Year 3: Animals; skeletal and nutrition.</p>	<p>a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>-recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit</p> <p>-recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Year 6 associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>-compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p>	<p>variety of plants and animals in their habitats, including microhabitats</p> <p>- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p>Year 4 recognise that environments can change and that this can sometimes pose dangers to living things.</p>
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					-use recognised symbols when representing a simple circuit in a diagram. Year 5: Changes in materials; groups and hardness, ne materials	
Building schema. Why is this important?	<p>Particles are foundational concept which will provide the basis of many scientific concepts in all areas. This topic is also a good opportunity to introduce the idea of a model to explain observations and how ideas change over time. The rest of the unit allows students to apply the model to a range of situations and demonstrate its effectiveness at explaining macro and microscopic properties of matter.</p> <p>Objects are made of particles with mass. Understanding particles helps us to design our world and explain properties of different materials</p>	<p>Cells, tissues, and organs are fundamental for students understanding in all areas of Biology giving them an appreciation of the scale within biological organisms from individual cells through to specialised systems adapted to work together in multicellular organisms. Learning to use the microscope develops working scientifically skills.</p> <p>Key concept #2 Cells and cell structures</p>	<p>This topic builds on work at Key Stage 2 Identify that some animals, including humans, have skeletons for support, movement, and protection.</p> <p>This topic bridges the gap between KS 3 and KS 4 by providing further knowledge on the relationship between cells, tissues and organs; and describe the function of the main organ systems; and describe the structure of the gas exchange system in humans.</p> <p>Key concept #3 The human skeleton and muscles</p>	<p>This topic builds on topics from Ht1 and KS2 by using particle theory to identify, describe and explain chemical reactions and reinforces evidence-based conservation of mass. By studying this topics student will have the prior knowledge to access topics taught in year 8 and year 9 and, underpins the basics of chemistry for GCSE.</p> <p>Chemical reactions occur in cells and allow transfer of energy building on knowledge acquired at the beginning of the year.</p> <p>Recognising that energy changes can our when new</p>	<p>This will help the students to develop their understanding of what electricity is and what happens within a circuit. Understand the scientific concepts of what happens with in circuits and how component affect the circuit. Students will have and opportunity to investigate further their learning by having an opportunity to carry out various practical's, which will also build on their skills in building circuits. The everyday world is a result of the flow of electrical charge</p> <p>transferring energy *</p> <p>Key concept #1 Making circuits Key concept #2 Electric current</p>	<p>This topic builds on the students' knowledge from the everyday materials topic at KS2. It also builds on knowledge from the particles and chemical reactions topic which was taught earlier in the year. This topic enables students to access the reactivity topic in year 9.</p> <p>*Understanding of energy transfer *The requirements of energy within an ecosystem *Peer review *Scientific theory</p> <p>Key concept #2 Interdependence and ecosystems</p>

	<p>and their interaction when energy is introduced to them.</p> <p>Atoms are a fundamental principal of science, and we need to understand matter before we introduce elements later on in year 7.</p> <p>Key concept #1 <u>Temperature</u></p> <p>Key concept # 5 <u>Energy stores and transfers</u></p>			<p>substances are formed. *</p> <p>Key concept #4 <u>Particles in solution</u></p> <p>Key concept #2 <u>Formula and symbols</u></p> <p>Key concept #1 <u>Atoms and molecules</u></p> <p>Key concept #1 <u>Reactions in solutions</u></p> <p>Key concept #2 <u>Combustion</u></p>		
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Year 8

Year 8	Ht1	Ht2	Ht3	Ht4	Ht5	Ht6
Topic	Energy and transfer	Balanced forces	KaST Revision Preparation Marking Summative assessment, Feedback and reporting.	Development of the Periodic table	Electricity and magnetism	KaST Revision Preparation Marking Summative assessment, feedback and reporting.
Learning question	How does heat energy transfer?	How do forces interact?		How was the periodic table developed?	Can we control magnetism?	
Key schema What is being taught?	<ul style="list-style-type: none"> -Conduction -Convection -Radiation Transfer of energy through particles and vacuum -Insulators and conductors -Reducing energy transfer in the home -Reducing energy transfer in the body 	<ul style="list-style-type: none"> -Interaction pairs Drag and friction -Resultant forces -Unbalanced forces -Deforming objects -Hooke's Law -Energy in springs 		<ul style="list-style-type: none"> -Atoms and element* -Developing theories* -Properties of metals and non-metals -Patterns and trends in group 1 -Patterns and trends in group 7 -The development of the periodic table -Chemical symbols 	<ul style="list-style-type: none"> - Magnets and magnetic poles -Plotting compasses -Earths magnetic field -Compass and magnification -What an electromagnet is _Investigation electromagnets -DC motors- how they work (simple) 	
Where Programme of study is met	National curriculum coverage: <ul style="list-style-type: none"> -heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) 	National curriculum coverage: <ul style="list-style-type: none"> -using force arrows in diagrams, dimension, balanced and unbalanced forces - forces: associated with deforming objects; stretching and squashing – springs; with rubbing 		National curriculum coverage: <ul style="list-style-type: none"> -the principles underpinning the Mendeleev Periodic Table* -Classification of elements based upon properties* he varying physical and chemical 	National curriculum coverage: <ul style="list-style-type: none"> -magnetic poles, attraction and repulsion -magnetic fields by plotting with compass, representation by field lines 	

	<p>or radiation; such transfers tending to reduce the temperature difference: use of insulators</p> <ul style="list-style-type: none"> -the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface -changes with temperature in motion and spacing of particles - internal energy stored in materials 	<p>and friction between surfaces, with pushing things out of the way; resistance to motion of air and water</p> <ul style="list-style-type: none"> - relative motion: trains and cars passing one another. 		<p>properties of different elements</p> <ul style="list-style-type: none"> -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 to acidity. - understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review - ask questions and develop a line of enquiry based on 	<ul style="list-style-type: none"> -Earth's magnetism, compass and navigation -the magnetic effect of a current, electromagnets, D.C. motors (principles only). 	
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				<p>observations of the real world, alongside prior knowledge and experience</p> <p>-make predictions using scientific knowledge and understanding</p>		
Why is this being taught now?	<p>Delves deeper into energy being transferred using matter, making links between particles and matter in year 7 and waves in year 8.</p> <p>We are delivering it in the same place as yr7 energy topic, to demonstrate to students that knowledge acquired in year 7 is built upon in subsequent years.</p>	<p>This topic builds upon year 7 – energy HT1 and forces in Ht2. It provides the necessary groundwork for topics including waves and forces and motion in year 9 and KS4. This topic builds upon the knowledge gained in KS2 about how objects move on different surfaces and how forces can act over distances.</p>		<p>This topic builds on the students' knowledge from the everyday materials topic at KS2. It also builds on knowledge from the particles and chemical reactions topic which was taught in year 7. This topic enables students to access the reactivity topic in year 9.</p>	<p>This topic builds upon electrical current in Ht5 of year 7 and build on acquired knowledge of electricity and magnetism taught in the unit prior to this. Electricity and how it reaches our homes, how appliances work and how current, magnetism, voltage and resistance interact is a fundamental principle in understanding electricity, power and physics at KS4 and beyond.</p>	
Pitstop assessment	Formative assessment and feedback.	Formative assessment and feedback.	RaP summative assessment and completion of RAP sheet	Formative assessment and feedback.	Formative assessment and feedback.	RaP summative assessment and completion of RAP sheet
Links to Ks2 National curriculum	Year 4 -recognise some common conductors and insulators, and	Year 3 -compare how things move on different surfaces		Year 1 describe the simple physical properties of	Year 4 identify common appliances that run on electricity	

	<p>associate metals with being good conductors.</p> <p>Year 5 compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p>	<p>-notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>-observe how magnets attract or repel each other and attract some materials and not others</p> <p>- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</p> <p>-describe magnets as having two poles</p> <p>- predict whether two magnets will attract or repel each other, depending on which poles are facing</p>		<p>a variety of everyday materials</p> <p>Year 5 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p>	<p>-construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>-identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>-recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>-recognise some common conductors and insulators, and associate metals with being good conductors.</p>	
<p>Building schema</p> <p>Why is this important?</p>	<p>An understanding of Energy, introduced by building on energy topic in Ht1 of year 7. Extends into pathways model allows pupils to describe and explain energy transfers in a wide range of everyday activities.</p>	<p>Forces are a fundamental part of the physics curriculum. As a method for energy transfer pupils can relate the action of forces directly to the changes that occur in the motion of objects.</p>		<p>This topic builds on the students' knowledge from the everyday materials topic at KS2. It also builds on knowledge from the particles and chemical reactions topic which was taught in year 7. This</p>	<p>This topic builds upon knowledge gained in KS2 regarding electrical appliances and building simple circuits. This topic builds upon the topic in Ht1 of yr7 -energy. This topic lays the groundwork for the</p>	

	Such as radiant energy. It builds also introduces radiant energy as a wave which sets foundations for energy being transferred as a wave. Key concept #3 <u>Thermal conduction</u>	The topic introduces several key equations which will continue to be used into KS4 Working scientifically skills include planning an investigation, presenting data in a variety of formats and plotting line graphs and calculating gradients. Key concept 3 <u>Balanced and unbalanced forces</u>		topic enables students to access the reactivity topic in year 9.	electricity topic studied in KS4 Key concept #3 <u>Voltage</u>	
Second part of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term
Topic	Earth, rocks and space	Human reproduction	Organ systems Digestion and Respiratory	Separation techniques	Voltage and resistance	Waves
Learning question	What is our Earth like and where are we in the solar system?	How are our bodies adapted to reproduce?	How do we receive the substance we require to live?	How are substances separated?	What is the relationship between voltage and resistance?	Does sound travel through all materials?
Key schema What is being covered?	-Layers of the Earth -Models of the Earth -Sedimentary rock -Igneous rock -Metamorphic rock -Carbon cycle -Space -Solar system	- The difference between puberty and adolescence -Changes our bodies undergo between childhood and adulthood	- Organs in the digestive system -Structural adaptations of the digestive system -Nutrition - Organs in the respiratory system	-Filtration -Evaporation -Chromatography -Distillation	- What is potential difference? -What is voltage _Voltage in series and parallel -Ratio of P.D to current	-Amplitude -Wavelength -Frequency -Pitch -Medium -Reading sound wave diagrams -The ear

	<ul style="list-style-type: none"> -Planets -Seasons -Day and night -Moon phases 	<ul style="list-style-type: none"> -Male and female reproductive organ systems - Conception and fertilisation -Menstrual cycle -Pregnancy and birth -Plant dissection -Flowering plants -Seed dispersal -Fertilisation and germination 	<ul style="list-style-type: none"> - Structural adaptations in the respiratory system - Gas exchange -Food tests -Nutrition and deficiency 		<ul style="list-style-type: none"> _Introduction of equations such as $V=IR$ -Resistance in conductors and insulators 	<ul style="list-style-type: none"> -Energy* -Transfer of sound between mediums* -Vacuums*
<p>Where Programme of study is met</p>	<p>National curriculum coverage: the composition of the Earth - the structure of the Earth -the rock cycle and the formation of igneous, sedimentary and metamorphic rocks -Earth as a source of limited resources and the efficacy of recycling - the carbon cycle -the composition of the atmosphere - the production of carbon dioxide by human activity and the impact on climate.</p>	<p>National curriculum coverage: Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta - the importance of plant reproduction through insect pollination in human food security</p>	<p>National curriculum coverage: - aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life - the role of diffusion in the movement of materials in and between cells -content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed</p>	<p>National curriculum coverage: -the concept of a pure substance -mixtures, including dissolving - simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography</p>	<p>National curriculum coverage: -measured in Volts, in circuits, series and parallel circuits -Voltage divides where branches occur. -potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current -differences in resistance between conducting and insulating components (quantitative).</p>	<p>National curriculum coverage: -frequencies of sound waves, measured in hertz (Hz); 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 loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal -auditory range of humans and animals. -pressure waves transferring energy; use for cleaning and physiotherapy by</p>

			<ul style="list-style-type: none"> -calculations of energy requirements in a healthy daily diet -the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases -the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) Science – key stage 3 6 -the importance of bacteria in the human digestive system the structure and functions of the gas exchange system in humans, including adaptations to function -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 			<p>ultra-sound; waves transferring information for conversion to electrical signals by microphone</p>
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			- the impact of exercise, asthma and smoking on the human gas exchange system			
Why is this being covered now?	This topic builds on key stage 2 where pupils learned the planet is dynamic and ever changing. It underpins topics in both Combined GCSE and Triple science. This topic enables students to access explanations for GCSE in parts of B6 evidence for evolution and understand the formation of crude oil in Organic Chemistry. This topic builds on the students' knowledge of the energy and forces topics from year 7. This topic builds on the students' knowledge from the Light & Shadows and Earth & Space topics in the KS2 curriculum.	This topic builds on the knowledge gained in the cells unit and at KS2 where students have been introduced to puberty and menstruation through science as well as PHSE. Following this unit, students will be able to build on their knowledge in the ecology unit in both year 8 and year 11 where they will further look at plant reproduction as well as in year 11 where they will study the menstrual cycle and the role of hormones within the cycle.	This topic builds on the students' knowledge of systems from the digestion topic in the KS2 curriculum. This topic enables students to build upon cells and tissues in HT3 of year 7 and reproduction just delivered in Ht2. The microscope and looking at tissue samples of the digestive system develops how to follow a scientific method which is essential to all practical work and introduces of mathematical formulas.	This topic builds on the students' knowledge of particles and matter in year 7. It underpins topics that will be taught in Chemistry in ks4 such as fractional distillation, producing a dry substance and Rf values.	This topic builds upon knowledge gained in KS2 regarding electrical appliances and building simple circuits. This topic builds upon the topic 7 -energy and current in year 7 and series and parallel circuits in year 7. This topic lays the groundwork for the electricity topic studied in KS4	Students will learn how energy is transferred by a sound wave. They will learn how to describe the properties of a wave and how that is related to the sound they hear. They will learn how the body detects soundwaves and how that information is transferred to the brain.
Assessment	Formative assessment and feedback.	Formative assessment and feedback.	Formative assessment and feedback.	Formative assessment and feedback.	Formative assessment and feedback.	N/A due to KaST

	Overarching summative assessment.	Overarching summative assessment.	Overarching summative assessment.	Overarching summative assessment.	Overarching summative assessment.	
Links to Ks2 National curriculum	<p>Year 5</p> <ul style="list-style-type: none"> -Describe the movement of the Earth, and other planets, relative to the Sun in the solar system -describe the movement of the Moon relative to the Earth -describe the Sun, Earth and Moon as approximately spherical bodies -use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<p>Year 2</p> <ul style="list-style-type: none"> -notice that animals, including humans, have offspring which grow into adults <p>Year 5</p> <ul style="list-style-type: none"> -describe the life process of reproduction in some plants and animals. 	<p>Year 4</p> <ul style="list-style-type: none"> -describe the simple functions of the basic parts of the digestive system in humans 	<p>Year 5</p> <ul style="list-style-type: none"> -use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - demonstrate that dissolving, mixing and changes of state are reversible changes 	<p>Year 4</p> <ul style="list-style-type: none"> identify common appliances that run on electricity -construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers -identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery -recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit - recognise some common conductors and insulators, and associate metals with being good conductors. 	<p>Year 4</p> <ul style="list-style-type: none"> -identify how sounds are made, associating some of them with something vibrating -recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it -find patterns between the volume of a sound and the strength of the vibrations that produced it -recognise that sounds get fainter as the distance from the sound source increases.
Building schema	Understanding our planet and its place within the solar	This unit provides knowledge on the structure and function	The introduction into cells, tissues and organs from year 7	Particles are foundational concept which will provide the	This will help the students to develop their understanding of	This topic build upon the work of topics previously taught in

<p>Why is this important?</p>	<p>system. How our planet is unique to all other planets and that enables life to be sustained. How layers to our planet are different compositions.</p> <p>Humans are affecting the carbon cycle and causing climate change. Genetic information and the environment affect features and growth of organisms.</p> <p>Space and what is 'out there' is an area of science that fascinates pupils and encourages them to look beyond what they see in their day to day lives.</p> <p>Key concept#1 Planets and the solar system Key concept #2 Gravity Key concept #3 Night sky, stars and galaxies</p> <p>Key concept# 1 Days and seasons</p>	<p>of reproduction systems in plants and animals, sexual and asexual reproduction and introduces the basic elements of genetics. Students will also learn about puberty and menstruation which is important to them in their current stage in life. During this unit students will have the opportunity to develop their working scientifically skills by collecting, displaying and analysing data.</p> <p>Key concept #1 Sexual reproduction in humans</p>	<p>units underpins knowledge taught in this unit. It focuses more specifically on the respiratory system and the digestive system, which will lay strong foundation for aerobic and anaerobic respiration in year 9 and biology units in KS4 and Bioenergetics beyond Birchwood.</p> <p>Key concept # 2 Supplying cells</p>	<p>basis of many scientific concepts in all areas. This topic build upon particles and matter in HT1 of year 7. It is also a good opportunity to introduce the idea of a model to explain observations and how separation of particles can be used in industry. The rest of the unit allows students to apply the model to a range of situations and demonstrate its effectiveness at explaining macro and microscopic properties of matter. Distillation, chromatography and separating rock salt develops working scientifically skills.</p> <p>Key concept # 3 Separating solutions</p>	<p>what electricity is and what happens within a circuit. Understand the scientific concepts of what happens with in circuits and how component affect the circuit. Students will have an opportunity to investigate further their learning by having an opportunity to carry out various practical's, which will also build on their skills in building circuits.</p> <p>Key concept # 3 Voltage Key concept #1 Resistance</p>	<p>KS3 such as Ht2- Cells, Ht1 Energy, Ht1 Space, Year 7 Electricity and year 8 Magnetism. This topic lays the groundwork for further study of the human body in KS4 and beyond and in the Y11 topics Waves & Electromagnetism</p> <p>Key concept # 1 Production of sound</p>
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Year 9

Year 9	Ht1	Ht2	Ht3	Ht4	Ht5	Ht6
			<p>KaST</p> <p>Revision</p> <p>Preparation</p> <p>Marking</p> <p>Summative assessment, feedback and reporting.</p>			<p>KaST</p> <p>Revision</p> <p>Preparation</p> <p>Marking</p> <p>Summative assessment, feedback and reporting.</p>
Topic	Energy and energy calculations	Forces pressure and moments		Photosynthesis and Respiration	The reactivity series	
Learning question	How can we calculate energy?	What is pressure?		How do organisms obtain energy to live?	How can we extract materials from the ground?	
Key schema- What is delivered?	<ul style="list-style-type: none"> -Renewable and non-renewable energy -Calculating the cost of energy -Comparing energy values -Comparing power ratings -Calculating work done 	<ul style="list-style-type: none"> -Atmospheric pressure -Pressure in liquids -Pressure calculations -Levers -Moments 		<ul style="list-style-type: none"> -Calculate means and identify the range in data collected -Describe and explain the effects of exercise on the respiratory system -Compare aerobic and anaerobic respiration -Describe the function of the root and root hair cells and compare to 'typical' plant cells -Explain how the adaptations of the root are related to its function - Identify the reactants and products of photosynthesis and describe using a word equation -Identify hazards and risks and suggest 	<ul style="list-style-type: none"> -Reactivity series -Displacement reactions -Uses of carbon to obtain metals - Thermal decomposition -Energetics- endothermic and exothermic reactions -Catalysts 	

				<p>appropriate ways to reduce the risks -</p> <p>Describe how leaves are adapted for their function</p> <ul style="list-style-type: none">-Use a microscope correctly to observe stomata - Explain how features enable the leaf to do its job-Label the xylem and phloem and describe their role in transporting water and sugars-Explain how plants have affected the levels of oxygen and carbon dioxide in the atmosphere-Identify the reactants and products of photosynthesis- Identify factors to change, measure and control to test a hypothesis- Collect and display data appropriately -- Draw conclusions from data collected- Describe photosynthesis using a word equation-Describe and explain factors which affect the rate of		
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				<p>photosynthesis - Describe how leaves are adapted for their function -Label the xylem and phloem and describe their role in transporting water and sugars</p>			
<p>Why is this being taught now?</p>	<p>Energy has been delivered in Ht1 of year 7 and Ht1 of year 8. It will prepare students for P1, P3 and P3 of year 10, all of which are taught in the first half term of Ks4. Energy for some students can be a difficult principle to grasp and there revisiting at exact points in their five year journey, should enable students to develop a deeper understanding of this key concept.</p>	<p>Forces are a fundamental part of the physics curriculum. As a method for energy transfer pupils can relate the action of forces directly to the changes that occur in the motion of objects. The topic introduces several key equations which will continue to be used into KS4 Working scientifically skills include planning an investigation, presenting data in a variety of formats and plotting line graphs and calculating gradients. It builds upon balanced forces in Ht1 of year 7 and unbalanced forces in Ht2 of year 8.</p>		<p>Bioenergetics is taught beyond Ks4 and links into many professional beyond education. It builds upon cells and tissues of year 7, Energy in yr 7, chemical reactions in year 7. It demonstrates that knowledge acquired prior is still applied. It prepares students for KS4 and begin scientific study such as field studies and transects. It builds upon energy transfer in food chains and how producers gain energy through endothermic reactions.</p>			

<p>Where Programme of study is met</p>	<p>National curriculum coverage: -comparing energy values of different foods (from labels) (kJ) -Comparing power ratings of appliances in watts (W, kW) - comparing amounts of energy transferred (J, kJ, kW hour) -domestic fuel bills, fuel use and costs -fuels and energy resources.</p>	<p>National curriculum coverage: -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 of force over area – acting normal to any surface - moment as the turning effect of a force</p>		<p>National curriculum coverage: -aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life -a word summary for aerobic respiration -the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration - the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.</p>	<p>National curriculum coverage: -the order of metals and carbon in the reactivity series -the use of carbon in obtaining metals from metal oxides -properties of ceramics, polymers and composites (qualitative).</p>	
<p>Assessment</p>	<p>Formative assessment and feedback.</p>	<p>Formative assessment and feedback.</p>		<p>Formative assessment and feedback.</p>	<p>Formative assessment and feedback.</p>	
<p>Building schema- Why is this important?</p>	<p>This unit builds upon energy transfers in year 7, thermal transfers in year 8 and</p>	<p>Building on forces of Ht 2 in year 7 and 8, students being to apply scientific calculations and</p>		<p>Students have studied energy in Ht1 of year 7, 8 and 9 and this has prepared them for this key concept of</p>	<p>This unit explains how rates of reaction can be affected and introduces the concepts of catalysts</p>	

	prepares students for Physics at KS4.	principles that underpins key knowledge and concepts at KS4.		biology-bioenergetics. This topic has many cross discipline links to biology and chemistry at KS4.	and surface area which is explored more in GCSE Chemistry. Students are introduced to endothermic, exothermic and builds on oxidation reactions taught in year 7.	
Second part of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term	Second half of term
Topic	Earths resources and climate	DNA, Chromosomes and inherited variation	Waves- light	Composite materials	Cells and Transport	Particles at work
Learning question	How do humans impact our earth?	Why are we all unique?	What is light?	How can materials be used?	How do organisms gain the substances they need?	How is energy stored and transferred? Why is the atom a fundamental chemical building block?
Key schema What is delivered?	<ul style="list-style-type: none"> -Extraction of metals -Earth's resources -Global warming and climate change -Air quality -Efficiency of recycling -Composition of earth's atmosphere -Production of CO₂ 	<ul style="list-style-type: none"> -Inheritance -Chromosomes, DNA and genes -The work of Franklin, Watson and Crick -Modelling DNA and the development of he DNA model -Difference between organisms -Natural selection -Evolution and extinction 	<ul style="list-style-type: none"> - Reflection -Refraction -Dispersion -Absorption -How we see colour 	<ul style="list-style-type: none"> - Composite materials - Polymers - Ceramics -Alloys -Interleaving qualitative data 	<ul style="list-style-type: none"> -Use a light microscope and calculate magnification. -State the similarities and differences between prokaryotic and eukaryotic cells and orders of magnitude -describe the roles of osmosis, active transport, and 	<ul style="list-style-type: none"> - Atoms -Development of atomic models -Electron structure -Ions -Isotopes -Atoms and radiation - Density

		-Biodiversity			diffusion in the movement of materials in and between cells. - Describe and explain different types of cell division that form gametes and body cells, and the division of cells in plants.	
Where Programme of study is met	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -The composition of the Earth - Earth as a source of limited resources and the efficacy of recycling -the carbon cycle -the composition of the atmosphere -the production of carbon dioxide by human activity and the impact on climate. 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -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, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model -differences between species - the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -the similarities and differences between light waves and waves in matter -light waves travelling through a vacuum; speed of light -the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface Science – key stage 3 - use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -properties of ceramics, polymers and composites (qualitative). 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope -the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts -the similarities and differences between plant and animal cells -the role of diffusion in the movement of materials in and between cells -the structural adaptations of some unicellular organisms 	<p>National curriculum coverage:</p> <ul style="list-style-type: none"> -differences between atoms, elements and compounds -chemical symbols and formulae for elements and compounds -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

		<p>-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 leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction</p>			<p>-the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms</p>	<p>and non-metal oxides with respect to acidity</p>
<p>Why is this being taught now?</p>	<p>In Ht2 of year 8 students have been taught about the structure of the earth and the rock cycle. Now students can learn about the long term impacts humans and demand by humans can have upon our planet.</p>	<p>In Year 7 students were introduced to Darwin and evolution. This unit will provide an opportunity to develop their understanding of how organisms have evolved due to their DNA.</p> <p>This is a fundamental principle for students in KS4 biology and prepare them well for their GCSE content.</p>	<p>Student have studied waves in Ht6 of year 8 and energy pathways in year 7. Light being taught now enables students to understand how light is needed in photosynthesis for the next unit and how it links in with energy transfer- radiation. It will provide a deeper understanding of the EM spectrum in KS4 physics and how the eye work in triple biology.</p>	<p>Students often pick engineering as an optional subject. By delivering this unit now, students can make cross-curricular links. Students have looks at materials and chemical reactions in year 7.</p>	<p>Cells are the basic unit of all forms of life. In this unit students will explore how a cell's structure helps with its function within the organism. They will move on to look at the ways in which cells divide and multiply. They will look at specialised and non-specialised cells and link these to stem cells. Student's will continue to look at stem cells and study</p>	<p>Bridging between disciplines to show how they interact is important. This unit demonstrates to students that disciplines often interact. These are key principles for understanding physics and chemistry at KS4.</p>

					their possible uses in medicine. This unit will be a bridging unit of the fundamental principles of cell organisation in Biology and will lay firm foundations for B1, B2, B3, B4 and preparation for September.	
Assessment	Formative assessment and feedback. Overarching summative assessment.	Formative assessment and feedback. Overarching summative assessment.	RaP summative assessment and completion of RAP feedback sheet	Formative assessment and feedback. Overarching summative assessment.	Formative assessment and feedback. Overarching summative assessment.	RaP summative assessment and completion of RAP feedback sheet
Building schema. Why is this important?	This topic builds on key stage 2 where pupils learned the planet is dynamic and ever changing. It underpins topics in both Combined GCSE and Triple science. This topic enables students to access explanations for GCSE in parts of B6 evidence for evolution and understand the formation of crude oil in Organic Chemistry.	This unit introduces photosynthesis preparing them for topic later on in the year and build prior substantive knowledge and disciplinary knowledge from year 7. This topic enables students to access the ecology and inheritance, variation and evolution topics within the KS4 curriculum. Students will develop scientific methods that are essential to all	An understanding of light and its behaviour is linked to a wide range of other topics within the science curriculum in all key stages. As a pathway for energy transfer it is relevant in biology and chemistry. Reflection & Refraction practical's develop scientific working skills. This topic enables students to access the Plants & Photosynthesis topic in year 9, Energy in	Students have studied, particles in year 7. Building on these ideas around useful materials from the Earth, particularly metals is useful for when the students move on to the reactivity series in their next unit of work.	Cells tissues and organs have been taught in Ht2 and 3 of year 7. They have been revisited in year 8 when students studied the digestive and respiratory system in more details focusing on scientific calculations and the microscope.	Students have studying the periodic table at year 7 and year 8. They will begin to develop granular knowledge to be successful at ks4.

		<p>practical work and introduces and develops mathematical formulas.</p>	<p>year 10, Waves in year 11 and Space Physics in year 11 if Triple Science is taken. Reflection & Refraction practical's develop how to follow a scientific method. Introduces key skills of drawing light rays diagrams and making accurate measurements using a protractor.</p>			
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