

3. FIVE YEAR CURRICULUM PLAN

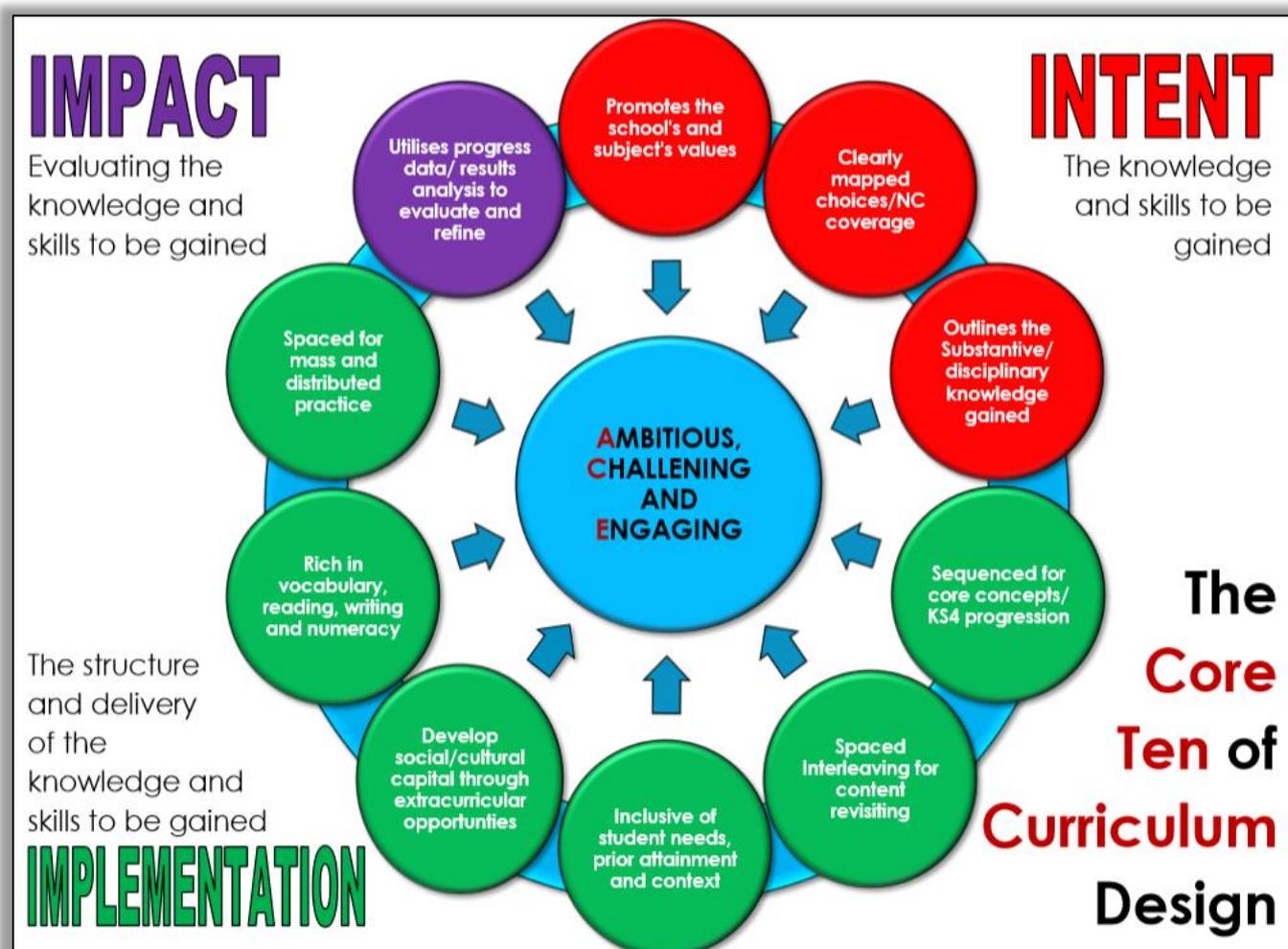
Key Stage 3 and 4

Subject: Science

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Created: November 2020

Updated:



Document(s) which inform this Five Year Curriculum Plan are:

1. Curriculum Intent Overview Plan (KS3 & KS4)
2. Curriculum Implementation Overview (KS3 & KS4)

KS3 – Year 7 Year Plan

Intent

Aims:	<ul style="list-style-type: none"> To be able to build on their previous KS2 knowledge and apply it to the topics studied To start to grasp scientific methods and practical skills To be able to build on their reading, writing and numeracy skills through a range of scientific activities
Academy values:	<ul style="list-style-type: none"> Ambitious - Students are able to access the content at their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment. Brave – Student will have to be brave and feel confident about learning new skills and building on skills that they already possess. Student will have to be brave by not being afraid to get things wrong. Kind – Students will have to be kind to themselves about learning challenging concepts and using skills that they may struggle with

Units of Study:

Unit/Topic 7A	Content:	Cells, tissues, organs and systems.	NC Content:	What are the minimum requirements for cells to exist and how do they carry out their role? Students will carry out simple and engaging experiments, such as using a microscope, to help to build their scientific intrigue and skills.
	Key Concepts:	Animal and plant cells, tissues and organs present in the human body and how they form an organ system.	Powerful Knowledge:	Cells – An understanding of how the body functions. How our cells function through healthy lifestyles.
Unit/Topic 7B	Content:	Sexual Reproduction in animals	NC Content:	Understanding how plants and animals reproduce. Students will also look closely at the reproductive organs of plants and animals so that they can understand how plants produce offspring and how animals have babies. This topic will help them to understand why some animals give birth to live young and why some animals lay eggs instead.
	Key Concepts:	How animals sexually reproduce to produce offspring, what is fertilisation and how is a baby born.	Powerful Knowledge:	Reproduction – Demonstrating links to cells and growth. To be able to talk about how babies are made and grown inside a humans body
Unit/Topic 7C	Content:	Muscles and Bones	NC Content:	Skeletal structure and breathing. Students will look at a human skeleton in detail. They will be able to answers questions such as: How many

				bones make up our skeleton? Where in our bodies would you find the smallest/largest bones?
	Key Concepts:	The structure of the human skeleton and how muscles work.	Powerful Knowledge:	Muscles and breathing – How the body produces energy. To be able to discuss how muscles allow movement.
Unit/Topic 7D	Content:	Ecosystems	NC Content:	What is an Ecosystem? Variation of plants and animals and inheritance of characteristics Students will investigate different types of ecosystems, how organisms interact in them and how different factors can influence an ecosystem.
	Key Concepts:	The structure of a basic ecosystem and how a plant or organism can have an impact on it.	Powerful Knowledge:	Ecosystems – To demonstrate an understanding that all living organisms live in habitats that are part of ecosystems.
Unit/Topic 7E	Content:	Mixtures and Separation	NC Content:	How to separate more complicated mixtures using Distillation. Students will carry out a range of investigations to separate substances that will include filtering rock salt to leave brine, and then evaporating techniques to leave behind pure salt.
	Key Concepts:	What is a mixture and the different separation techniques, such as filtration, that can be used?	Powerful Knowledge:	Separating substances – An understanding that mixed substances can be made pure, such as drugs and medicines.
Unit/Topic 7F	Content:	Acids and Alkalis	NC Content:	Neutralisation, indicators and how to test for acids and alkalis. Students will carry out scientific experiments using a variety of acids and alkalis and different experimental techniques to build on their practical skills.
	Key Concepts:	The definition of an acid and an alkali and how they react together to form a neutralisation reaction.	Powerful Knowledge:	Acids and Alkalis – Show an understanding of the function of acids and alkalis and be able to discuss their everyday uses.
Unit/Topic 7G	Content:	The particle model	NC Content:	Looking at the structure of an atom. What makes up the matter in the universe? What are the different states of matter? What are the building blocks for life?
	Key Concepts:	The arrangement of particles in solids, liquids and gasses and the properties of them.	Powerful Knowledge:	The Particle Model – An understanding of what makes up all matter and an insight into how different materials can be made.

Unit/Topic 7H	Content:	Atoms, elements and compounds	NC Content:	Students will be introduced to atoms and the Periodic Table so that they can gain an appreciation that everything is made up of something and as a young scientist they can then study atoms and which elements to use to make certain compounds. Introduction to the Periodic Table, chances are most students will not have seen one before.
	Key Concepts:	The structure of an atoms, elements and compounds and how compounds are made.	Powerful Knowledge:	Atoms, elements and compounds– To be able to discuss patterns and trends displayed in chemical reactions. To be able to predict the name of a compound made from certain elements.
Unit/Topic 7I	Content:	Energy	NC Content:	Looking at the different energy stores that are used to provide us with energy. Students will look at the different energy stores that humans use for example: electrical energy or heat energy and then build on their understanding of how we use these stores for our own uses. For example, a dam being used to provide electrical energy for a child's play station!
	Key Concepts:	The different types of energy stores and how they can be used to provide energy for appliances.	Powerful Knowledge:	Energy – To be able to discuss the different energy stores there are how they can be altered used and transferred.
Unit/Topic 7J	Content:	Current and Electricity	NC Content:	Drawing circuit diagrams and understanding how electricity flows. Students design and build circuits will a selection of components, such as a bulb, motor or switch.
	Key Concepts:	The building of electrical circuits and how they work, what is current and voltage?	Powerful Knowledge:	Current and Electricity –To be able to demonstrate understanding of how circuits work. An insight into how most devices are powered by electrical circuits. To be able to build an electrical circuit using different components.
Unit/Topic 7K	Content:	Forces	NC Content:	What is a force and how can they Influence objects? Students will start to understand what happens to objects if they are pulled or pushed. They may start to develop an understanding of

				gravity and the difference between mass and weight. For example, bathroom scales measure our mass not our weight!
	Key Concepts:	The different types of forces and how they can affect objects.	Powerful Knowledge:	Forces – How forces can change the movement of objects. To be able to discuss the different types of forces and the impact they can have.
Unit/Topic 7L	Content:	Sound	NC Content:	Sound waves - how is sound produced and recorded. Introduction of a longitudinal wave Students will also explore how sound waves are formed and how our ears and brain detect and transform sound waves into sounds that we understand and can hear. If a tree falls in the forest and no one hears it does it still make a sound?
	Key Concepts:	How sound is formed and how a human ear hears a sound.	Powerful Knowledge:	Sound – To be able to talk about how this type of energy can be produced and transferred, and how a human ear can detect sound.

Implementation

Progression from KS2:	Pupils will build upon the following areas studied at KS2: Living things and their habitats Animals including humans Evolution and Inheritance Light Electricity
Progression to Year 8:	Students need to have a good understanding of the structure and function of animal and plant cells in order to apply this in 8B Plants and reproduction, and 8D unicellular organisms. Sound knowledge of atoms, elements and compounds are important to understand the content taught in 8E Combustion, 8F The periodic table and 8G Metals and their uses. The basics of energy and forces covered in year 7 will be built upon in 8K Energy transfers and 8L Earth and space, therefore having a good knowledge of the basics will be advantageous to students. A general knowledge of health and lifestyle would also be useful when looking at topics 8A food and nutrition. Along with 8C breathing and respiration, which has links to exercise. Students should have now learnt the basic scientific skills for investigative work, which will be expanded further during Year 8.
Spaced Interleaving:	Our curriculum allows us to move to unrelated content and return to it later. Biology, Chemistry and Physics topics are spaced between each other which enables knowledge to be revisited throughout the year. This gives opportunities for recalling specific learning. For example, the knowledge gained in 7A Cells, tissues, organs and systems, will be revisited and used again later on in the year in topic 7C Muscles and bones. Topic 7E Mixtures and separation will be referred to during topic 7F Acids and alkalis and 7H Atoms elements and compounds. The latter topic binding all of the Chemistry topics together. The techniques and skills learned within the Physics topics are revisited throughout the year e.g. mathematical skills used with topic 7J Current electricity and 7K Forces. General investigative work is included in most topics throughout the year, giving students the opportunity to revisit and practice these skills on a regular basis.

Student Needs:	SEND:	All sessions will be differentiated for all students within the learning session including those with SEND needs. Teaching strategies for SEND students may include repetition of key words or ideas, modelling processes or theories to enable all students to grasp the fundamental ideas, revisiting of previous content to ensure full knowledge and understanding has been maintained and to eliminate any content misconceptions. Further strategies will include identifying students who are struggling, after the completion of assessments, and then providing appropriate intervention for them to enhance their learning. This intervention may include one to one learning sessions or small group working sessions where more time can be spent using bespoke strategies for that particular student to help them to improve.	Context	The content covered allows students to see a wide range of uses and careers for science and students will review some of the careers that could be open to them. Transient employment or low paid jobs is high for the parents of our students. Students will cover work on digestion and muscles and therefore we will support students in being healthier
	LPA:	All sessions have differentiated activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra support for them. LPA students may also be given additional support to help complete activities. When homework is set, LPA students may be given a differentiated activity to support them with completing the task.	HPA:	All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further. This activity may consist of using tier 3 vocabulary words in extended writing pieces or more comprehensive questions. The activities will also be activities whereby students' needs to use higher level thinking skills and use and understand

				higher level command words such as compare or discuss.
Extracurricular:	<p>Science club- modelling a digestive system Stem club- Building a solar powered car Visit to a Power Station to see how electricity is generated Cross curricular opportunities with the PE department to understand how muscles work Visit to a wildlife Nature Reserve to study ecosystems ICT use to show how different sounds can be generated</p>			
Literacy/Numeracy:	Vocab (tier 2/3):	<p>Topics 7A+7E are rich in tier 3 vocabulary. Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. As part of their practical write up for 7E they will use a range of tier 2 words to describe how they conduct their experiment.</p> <p>Topics 7I+7B are rich in tier 3 vocabulary. Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words 7I will complete a task relating to the motion of objects. Students will use tier 2 words to describe the motion of objects after using synonyms to increase their vocabulary.</p> <p>Topics 7G+7J are rich in tier 2+3 vocabulary. Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. Students will revisit term 2 work</p>	Reading:	<p>Reading for research for the organelles within a cell.</p> <p>Analysis task for 7E – checking that students know how to carry out the steps for a practical</p> <p>Reading for analysis to review energy use and how it has changed since 2000.</p> <p>Research work using the textbooks for 7B (books to ensure research is appropriate).</p> <p>7G and 7J Key words used for this topic to be provided throughout all reading of the textbook. Higher number of tier 3 words. Teacher led reading will be needed</p> <p>7C – Concentrate on why and how questions after reading the text in order to support the students in explaining the topic. 7F – Students will develop skimming of texts to review contents of chemicals and hazcards for a range of household chemicals.</p> <p>7K – Big picture question regarding transport. Use news article to unpick tier 2 words to support students in their responses.</p> <p>7D – Use texts to develop summarising skills</p> <p>7H – Teacher led reading through text to analysis how matter is made up.</p> <p>7L – Students to read for analysis to construct information regarding human hearing.</p>

on motion and use this piece to describe the particle model. Changing some tier 2 words for different ones.

Topics 7C+7F are rich in tier 3 vocabulary. Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. 7F will build on the term 1 topic 7E. The students will therefore revisit their tier 3 words from term 1 7E.

Topics 7K+7D are rich in tier 3 vocabulary, students would have used some of the tier 3 words in 7D from KS2. Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. Students will now organise their words into semantic groups. This will help them group words together.

Topics 7H+7L are rich in tier 3 vocabulary. Students will be given a list of key words at the start of the topic to practise. 7L will have the addition of different words with the same meaning as those used in music. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. As part of their practical write up for 7E they will use a range of tier 2

		<p>words to describe how they conduct their experiment.</p>		
	<p>Writing:</p>	<p>Extended piece of writing in at least 1 lesson per topic</p> <p>Exit tickets within each topic</p> <p>Writing a scientific method, which includes sub headings to break down into manageable chunks (7E)</p> <p>A lesson on summarising information, allowing students to select key pieces of information and re-write it in their own words. Writing frame given to support this (7I)</p> <p>Pupils write their own article about waste using adjectives, comparatives and superlatives (7G)</p> <p>A QWC question describing the differences between fact and opinion, drawing upon different example. Structured writing frame given for support (7H)</p>	<p>Numeracy:</p>	<p>Scale of a cell, hair etc</p> <p>Calculate energy use. Appreciate why Joule isn't always the most appropriate unit.</p> <p>Appreciation of the size of an atom (clip showing zooming in x10)</p> <p>An introduction to the pH scale not being linear</p> <p>Using equations for motion. Reviewing data on ecosystems – 3 averages.</p> <p>Appreciation of a log scale (no mathematics).</p> <p>Reinforce atom size from term 3</p>
<p>Practice:</p>	<p>Mass:</p>	<p>End of topic Assessments for each topic</p>	<p>Distributed:</p>	<p>Exit tickets</p> <p>Quick quizzes</p> <p>Starters and plenaries throughout each topic that reviews previous learning.</p> <p>Practicals – writing up method and analysing results</p>

				Reflection of learning – pupils given opportunities throughout the topics to revisit previous learning and also think about how to improve, using quick quizzes and marked exit tickets to do this Stretch opportunities with extended writing tasks
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KS3 – Year 8 Year Plan

Intent

Aims:	<ul style="list-style-type: none"> To be able to build on their knowledge gained during Year 7. To apply previous knowledge to the topics studied To be more confident with practical work in science, and to start to apply their practical knowledge to the content that is being studied. To be able to build on their reading, writing and numeracy skills through a range of scientific activities
Academy values:	<ul style="list-style-type: none"> Ambitious - Students are able to access the content at their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment. Brave – Student will have to be brave and feel confident about learning new skills and building on skills that they already possess. Student will have to be brave by not being afraid to get things wrong. Kind – Students will have to be kind to themselves about learning challenging concepts and using skills that they may struggle with

Units of Study:

Unit/Topic 8A	Content:	Food and Nutrition	NC Content:	Nutrients needed for basic nutrition and how waste food is then disposed of. Students will gain a good understanding of the different types of nutrients that a human body needs and the reasons why we need to eat a balanced diet.
	Key Concepts:	The nutrients needed from food for the human body to function.	Powerful Knowledge:	Food and Nutrition– An understanding of how the human body carries out the process of digestion and why nutrients are so important in the human body.

Unit/Topic 8B	Content:	Plants and Reproduction	NC Content:	Students will then focus on plants, how they reproduce in terms of pollination. Students will then also study how plants use pollination to produce offspring
	Key Concepts:	The reproduction methods of plants and how pollination is used.	Powerful Knowledge:	Plants and Reproduction-Understanding how plants reproduction using the process of pollination
Unit/Topic 8C	Content:	Breathing and Respiration	NC Content:	Introduction to the process of Respiration. Students will explore respiration in plants and the conditions necessary for the process to take place. Students will also study the process of gas exchange.
	Key Concepts:	Breathing is the physical process of taking in air (for oxygen) and then expelling it to remove CO ₂ , respiration is a chemical process.	Powerful Knowledge:	Breathing and Respiration – How the body effectively carries out respiration and the difference between breathing and respiration.
Unit/Topic 8D	Content:	Unicellular organisms	NC Content:	Introduction to Microorganisms, unicellular and multicellular organisms. Students will study the structure and behaviour of bacteria, viruses and fungi. Students can then begin to associate this behaviour with diseases and start to understand how bacteria and viruses cause illness and what can be done to treat them. Students will hopefully realise that antibiotics are not necessary for all illnesses.
	Key Concepts:	The structure of unicellular organisms and their features.	Powerful Knowledge:	Unicellular organisms –To understand what unicellular organisms are and their structure and functions.
Unit/Topic 8E	Content:	Combustion	NC Content:	Students will focus on combustion and learn how to write basic equations. Students will have a go at burning metals, as an example of combustion, to observe and record what happens.
	Key Concepts:	Combustion is a chemical reaction that produces useful energy and produces carbon dioxide and water as waste products.	Powerful Knowledge:	Combustion – Understanding how the process of combustion works and what the products will be.

Unit/Topic 8F	Content:	The Periodic Table	NC Content:	Introduction to elements in the Earth and where to find them. Students will explore some of the elements that we can find in the Periodic Table and how we then use these elements to make everyday products
	Key Concepts:	The structure and function of the Periodic Table.	Powerful Knowledge:	The Periodic Table – Understand how useful the Periodic Table is and what is found in it. To be able to state how we can use the Earth's resources.
Unit/Topic 8G	Content:	Metals and their uses	NC Content:	Introduction to metals, their chemical reactions, properties and their uses. Students will engage in experiments to predict and discover what happens to metals when they react with fire, water and acids.
	Key Concepts:	The properties of metals and why they are used for certain things.	Powerful Knowledge:	Metals and their uses –How metals are extracted from the Earth and what we can use metals for.
Unit/Topic 8H	Content:	Rocks	NC Content:	Introduction to Rocks and the Rock Cycle. Students will learn about the different categories of rocks, how they are formed and categorised.
	Key Concepts:	The formation and structure of different rock types.	Powerful Knowledge:	Rocks – To understand the formation of different types of rocks and what they can be used for.
Unit/Topic 8I	Content:	Fluids	NC Content:	Pressure in air and in liquids. Students will investigate the meaning of pressure, how to calculate it and how it affects everyday objects.
	Key Concepts:	What is pressure and how can it be used in everyday situations.	Powerful Knowledge:	Fluids – Knowledge of the range of uses for fluids and pressure in everyday situations.
Unit/Topic 8J	Content:	Light	NC Content:	Introduction to the study of light energy. Students will learn about refraction, reflection and how colour is seen. Students will lastly develop their understanding of light and all of the amazing things that light energy can do. For example using light energy to create disco lights!

	Key Concepts:	The purpose of light energy and how we can see objects.	Powerful Knowledge:	Light – How light and other waves can be used for data communication. An understanding of visible light and how we see objects
Unit/Topic 8K	Content:	Energy Transfers	NC Content:	Students will learn about the transfer of energy, Power, Efficiency and how to calculate energy used and the energy efficiency of different appliances.
	Key Concepts:	How energy can be transferred from one source to another and how this is useful.	Powerful Knowledge:	Energy Transfers – The range of energy transfers that can take place and how we change these energy stores.
Unit/Topic 8L	Content:	Earth and Space	NC Content:	Introduction to Space, luminous objects, the solar system and space travel. Students will explore space and its structure to try to understand as much as we can understand about space. Students will learn about the International Space station (ISS) and how astronauts can live in space.
	Key Concepts:	The structure of Earth and our solar system.	Powerful Knowledge:	Space – What is out there? To understand the structure of our solar system and how space exploration works.

Implementation

Progression from Year 7:	Students need to have a good understanding of the structure and function of animal and plant cells in order to apply this in 8B Plants and reproduction, and 8D unicellular organisms. Sound knowledge of atoms, elements and compounds are important to understand the content taught in 8E Combustion, 8F The periodic table and 8G Metals and their uses. The basics of energy and forces covered in year 7 will be built upon in 8K Energy transfers and 8L Earth and space, therefore having a good knowledge of the basics will be advantageous to students. A general knowledge of health and lifestyle would also be useful when looking at topics 8A food and nutrition. Along with 8C breathing and respiration, which has links to exercise. Students should have now learnt the basic scientific skills for investigative work, which will be expanded further during Year 8.
Progression to Year 9:	Students will need to have good understanding about sexual reproduction to apply this knowledge to topic 9A Genetics and evolution, which includes reasons why offspring vary and are not identical to their parents. The knowledge gained from the topic 8B Plants and reproduction can be applied within topic 9B Plant growth, so grasping the basics of plants in Year 7 and 8 will be advantageous for Year 9. Sound knowledge about general reactions and what happens in reactions are important to understand the content taught in 9F Reactivity and 9H Chemistry transition to GCSE. This includes having a good knowledge about atoms, elements and compounds and what type of observations to make when a reaction occurs. Forces, which have been continually revisited and built upon during Year 7 and 8, will be further expanded in the topics 9I Forces and motion and 9J Force field and electromagnets. Therefore, having a good knowledge about general forces will give students a successful start to year 9. Students should have now built upon their scientific skills for investigative work, and will have more knowledge about how to write up investigative work. These skills will be constantly revisited and expanded upon during Year 9.

Spaced Interleaving:	<p>Our curriculum allows us to move to unrelated content and return to it later. Biology, Chemistry and Physics topics are spaced between each other which enables knowledge to be revisited throughout the year. This gives opportunities for recalling specific learning. For example, 8A Food and nutrition will have links to 8C Breathing and respiration, recalling that food and exercise have a direct impact on health. Topic 8E Combustion can be linked with topic 8G Metals and their use, as they both contain knowledge about chemical reactions. 8J Light has aspects of learning that can be recalled in topic 8L Earth and space. General investigative work is included in most topics throughout the year, giving students the opportunity to revisit and practice these skills on a regular basis. Topics have been split for this newer version to allow more interleaving.</p>			
Student Needs:	SEND:	<p>All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further. This activity may consist of using tier 3 vocabulary words in extended writing pieces or more comprehensive questions. The activities will also be activities whereby students' needs to use higher level thinking skills and use and understand higher level command words such as compare or discuss. AQA exemplar exam questions may be used to give students practice with the types of questions they will experience at GCSE.</p>	Context	<p>The content covered allows students to see a wide range of uses and careers for science and students will review some of the careers that could be open to them. Transient employment or low paid jobs is high for the parents of our students. Students will cover work on nutrition, bacteria and viruses, and breathing and therefore we will support students in being healthier and how to reduce disease transmission. Students will understand how "valued added" industry can be created from the science, crystal grown metals.</p>
	LPA:	<p>All sessions have differentiated activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra support for them. LPA students</p>	HPA:	<p>All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their</p>

		may also be given additional support to help complete activities. When homework is set, LPA students may be given a differentiated activity to support them with completing the task.		knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further.
Extracurricular:	<p>Science Club- building a model of the digestive system</p> <p>Stem club- building a machine to demonstrate pressure in liquids</p> <p>Science club- building periscopes and kaleidoscopes to study light</p> <p>Visit to a factory to see how metal objects are made</p> <p>Visit to a University/laboratory to see how they study bacteria</p> <p>Visit to Cannock chase to study different rock formations</p> <p>Visit to National Space Centre</p>			
Literacy/Numeracy:	Vocab (tier 2/3):	<p>Students will be given a list of key words at the start of the topic to practise. At the halfway point in each topic students will complete a spelling and definition of the tier 3 words. As part of their practical write up for 8E they will use a range of tier 2 words to describe how they conduct their experiment. In 8A Food and Nutrition, they will be exposed to the tier 2+3 words from 7C. Using a text from 7C we will develop the use of more tier 2 words that could be used in 8A Food and Nutrition, too.</p> <p>8I will use tier 3 words that will have different meanings in the context of the lesson such as fluid and pressure. These words will form part of a writing activity to describe the movement of particles.</p> <p>8B will links back to 7A and 7B – a definitions test on these words will form part of the topic.</p> <p>Students will compare the animal</p>	Reading:	<p>8A – Read for analysis to review diets/food labels.</p> <p>8C – Read for summarising and inference – how will we carry out the experiment</p> <p>8I – Read for analysis to support the writing activity on particles.</p> <p>8B – Questions based on text will move towards why questions. Linking elements from the text together</p> <p>8F – Use big picture of how the periodic table works. Students will skim to spot patterns.</p> <p>8J – Skimming to find where to measure angles for a refraction experiment</p> <p>8C – Key words covered. Students will discuss the text to show summarising skills for how we get oxygen into our cells.</p> <p>8G – Reading for research, noting uses for metals</p> <p>8K – Analysis of text to review efficiencies and different energy sources. 8D – Key words reviewed; students will develop scanning to then review unicellular organisms</p> <p>8H – Students will read text on the rock cycle, followed by questions on why we can infer the type of rock from its structure.</p> <p>8L Students will read for research and include their own tier 3 words. Students will peer review the research</p>

and plant reproduction and will write a piece to describe similarities and differences using a selection of tier 2 and 3 words

8F will have tier 3 words that are regularly used in each lesson. DNA will include use of these tier 3 words. 8J – students will describe how they have conducted their experiments using a range of tier 2 and 3 words to describe reflection and refraction

8C will rely on tier 3 words. Some linked to 7C. Students will be given the same tier 3 words from 7C and be tested on their definitions before moving to new tier 3 words. 8G will involve writing up an experiment from reactions with metals. Students will spend time looking at a range of tier 2 words that can be used in their planning

8K Energy Transfers link back to both 7J and 7K. Students will spend time recapping the definition of the tier 3 words. Students will then use these tier 3 words to explain a range of energy transfers.

8D Unicellular organisms will use tier 3 from 7A. DNA tasks will use a range of these words. Students will develop the range of tier 2 words to describe movement of unicellular organisms

8H Rocks – Topic will start with a tier 3 definitions test on the words that would be covered in

		<p>KS2. Students will write and extended piece on the rock cycle using a range of tier 2 and 3 words. Peer assess each other to improve the range of tier 2 words used.</p> <p>8L Earth and Space will use tier 3 words to explain the orbital movements, but students will increase their own tier 3 words through their research and record these as part of their work</p>		
	<p>Writing:</p>	<p>Extended piece of writing in at least 1 lesson per topic</p> <p>Exit tickets within each topic</p> <p>Lesson on explaining texts, which gives the opportunity to highlight key information and writing an explanation using key words (8E)</p> <p>Structuring paragraphs lesson given examples of how to structure paragraphs (8B)</p> <p>Lesson on accuracy and precision, which gives the opportunity to write an explanation about precision of experiments using key scientific words (8K)</p> <p>Pupils write their own article about theories in geology, using writing frames to compose their explanations (8H)</p>	<p>Numeracy:</p>	<p>Reviewing tables of data – food labels</p> <p>Recap cell size. Apply to plant size. Estimate of number of cells</p> <p>Review of scale. Angles measured – what are the patterns</p> <p>Review units, estimates of lung capacity</p> <p>Energy calculations – links to ratio</p> <p>Scale, now larger sizes – how does the calculation differ compared to scaling down</p>

Practice:	Mass:	End of topic Assessments for each topic	Distributed:	<p>Exit tickets</p> <p>Quick quizzes</p> <p>Starters and plenaries throughout each topic that reviews previous learning.</p> <p>Practicals – writing up method and analysing results</p> <p>Reflection of learning – pupils given opportunities throughout the topics to revisit previous learning and also think about how to improve, using quick quizzes and marked exit tickets to do this</p> <p>Stretch opportunities with extended writing tasks</p>
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KS3 – Year 9 Year Plan

Intent

Aims:	<ul style="list-style-type: none"> To be able to build on their knowledge gained during Year 7 and 8. To apply previous knowledge to the topics studied To develop their practical skills further, being more confident and being able to apply their knowledge in this situation To be able to build on their reading, writing and numeracy skills through a range of scientific activities Prepare for transition to Key Stage 4
Academy values:	<ul style="list-style-type: none"> Ambitious - Students are able to access the content at their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment. Brave – Student will have to be brave and feel confident about learning new skills and building on skills that they already possess. Student will have to be brave by not being afraid to get things wrong. Kind – Students will have to be kind to themselves about learning challenging concepts and using skills that they may struggle with

Units of Study:

Unit/Topic 9A	Content:	Genetics and Evolution	NC Content:	Introduction to Genetics and Evolution in animal and plants. Students will explore the
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				structure of DNA and how it leads to genetic changes in humans and the idea of natural selection.
	Key Concepts:	The structure of DNA and how mutations can occur. The Evolution of organisms such as humans and how this is evident.	Powerful Knowledge:	Genetics and Evolution- The understanding of how the same species of organisms can be different. To be able to discuss how certain organisms have evolved over time.
Unit/Topic 9B	Content:	Plant Growth	NC Content:	Introduction to how plants grow and how farmers try to increase the yield of their crops. Students will learn about the process of Photosynthesis and what plants need to grow and develop
	Key Concepts:	The key components needed for successful plant growth, including levels of CO ₂ , water and sunlight available.	Powerful Knowledge:	Plant Growth-The understanding of what plants need to grow successfully and what can impede their growth
Unit/Topic 9C	Content:	Biology revision and projects	NC Content:	These projects are designed to engage and challenge students further. To allow them to explore a range of scientific ideas and complete more practical experiments.
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	GCSE revision and project work- Students will be able to demonstrate their understanding of the topics taught in years 7-9. They will be able to engage and participate in project work where they will have the opportunity to practise and demonstrate their knowledge and skills acquired.
Unit/Topic 9D	Content:	Biology Transition to GCSE	NC Content:	These topics are provided for students to be able to make an easier transition between KS3 and KS4 when they start GCSE. This will also allow staff to pick up and correct any misconceptions. Students will also be able to build on their skills and knowledge. Fundamentals such as cells and their functions. The atom and why chemicals react. Energy – the range of energy stores and their uses.
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	GCSE Transition Topics- Students gain an insight into the knowledge and skills required to successfully engage with, study and complete examinations at GCSE level. Students will be

				able to use this knowledge as a sound grounding to discuss a range of challenges such as bacteria and virus infections and how the connected planet impacts on this.
Unit/Topic 9E	Content:	Making materials	NC Content:	Introduction to Materials used for the production of everyday objects. Students will learn about the use of ceramics and glass to make materials.
	Key Concepts:	How materials are chosen to make certain products and how they are made	Powerful Knowledge:	Making Materials-To understand how materials are chosen to make certain products and how they are made.
Unit/Topic 9F	Content:	Reactivity	NC Content:	Introduction to Reactivity in terms of chemical reactions. Students will look at reactions of metals with acids and water for example.
	Key Concepts:	The different levels of reactivity of metals with different reagents.	Powerful Knowledge:	Reactivity-The understanding of how metals react with different substances and how to test for their products.
Unit/Topic 9G	Content:	Chemistry revision and projects	NC Content:	These projects are designed to engage and challenge students further. To allow them to explore a range of scientific ideas and complete more practical experiments.
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	GCSE revision and project work- Students will be able to demonstrate their understanding of the topics taught in years 7-9. They will be able to engage and participate in project work where they will have the opportunity to practise and demonstrate their knowledge and skills acquired.
Unit/Topic 9H	Content:	Chemistry Transition to GCSE	NC Content:	These topics are provided for students to be able to make an easier transition between KS3 and KS4 when they start GCSE. This will also allow staff to pick up and correct any misconceptions. Students will also be able to build on their skills and knowledge. Fundamentals such as cells and their functions. The atom and why chemicals react. Energy – the range of energy stores and their uses.
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	GCSE Transition Topics- Students gain an insight into the knowledge and skills required to

				successfully engage with, study and complete examinations at GCSE level. Students will be able to use this knowledge as a sound grounding to discuss a range of challenges such as how materials can be used/extracted to make new materials.
Unit/Topic 9I	Content:	Forces and Motion	NC Content:	Forces, Speed and how it is calculated. Students will explore the connection between the distance objects can travel and how long it takes them to and then learn how to calculate the speed of the object
	Key Concepts:	The impact of forces on objects such as a car and how the speed of the car can then be calculated.	Powerful Knowledge:	Forces and Motion-Understanding how forces are used in the movement of different kinds of objects, for example race cars and industrial cranes
Unit/Topic 9J	Content:	Force Fields and Electromagnets	NC Content:	Further study of electricity by looking at force fields and electromagnets. Building on previous learning from year 7J current and electricity. Students will learn about resistance in circuits, static electricity, the formation of force fields and electromagnets.
	Key Concepts:	The formation of a force field and how an electromagnet is made.	Powerful Knowledge:	Force field and Electromagnets-The understanding of how electrical of how a force field is generated and how an electromagnet can be made.
Unit/Topic 9K	Content:	Physics revision and projects	NC Content:	These projects are designed to engage and challenge students further. To allow them to explore a range of scientific ideas and complete more practical experiments.
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	GCSE revision and project work- Students will be able to demonstrate their understanding of the topics taught in years 7-9. They will be able to engage and participate in project work where they will have the opportunity to practise and demonstrate their knowledge and skills acquired.
Unit/Topic 9I	Content:	Physics Transition to GCSE	NC Content:	These topics are provided for students to be able to make an easier transition between KS3 and KS4 when they start GCSE. This will also allow staff to pick up and correct any

				<p>misconceptions. Students will also be able to build on their skills and knowledge. Fundamentals such as cells and their functions. The atom and why chemicals react. Energy – the range of energy stores and their uses.</p>
	Key Concepts:	Key revision skills and vital information for GCSE.	Powerful Knowledge:	<p>GCSE Transition Topics- Students gain an insight into the knowledge and skills required to successfully engage with, study and complete examinations at GCSE level. Students will be able to use this knowledge as a sound grounding to discuss a range of challenges such as how our energy requirements are impacting our planet and what measures we can use to alter this.</p>

Implementation

Progression from Year 8	<p>Students will need to have good understanding about sexual reproduction to apply this knowledge to topic 9A Genetics and evolution, which includes reasons why offspring vary and are not identical to their parents. The knowledge gained from the topic 8B Plants and reproduction can be applied within topic 9B Plant growth, so grasping the basics of plants in Year 7 and 8 will be advantageous for Year 9.</p> <p>Sound knowledge about general reactions and what happens in reactions are important to understand the content taught in 9F Reactivity and 9H Chemistry transition to GCSE. This includes having a good knowledge about atoms, elements and compounds and what type of observations to make when a reaction occurs.</p> <p>Forces, which have been continually revisited and built upon during Year 7 and 8, will be further expanded in the topics 9I Forces and motion and 9J Force field and electromagnets. Therefore, having a good knowledge about general forces will give students a successful start to year 9.</p> <p>Students should have now built upon their scientific skills for investigative work, and will have more knowledge about how to write up investigative work. These skills will be constantly revisited and expanded upon during Year 9.</p>
Progression to Year 10:	<p>The knowledge gained in the topics 9D Biology transition to GCSE, 9H Chemistry transition to GCSE and 9L Physics transition to GCSE are the building blocks for the topics covered in Year 10 and 11. For Biology, this includes knowledge about cells, evolution, genetics, plant processes and the human body. For Chemistry, this includes knowledge about atoms, elements and compounds, reactivity, states of matter and the periodic table. For Physics this includes knowledge about energy, electricity, forces and light. This gradual introduction of knowledge to these areas in Year 9 will ensure they have the foundations and therefore giving students a successful start to Year 10.</p> <p>Students should have now built upon their scientific skills for investigative work, and will have more knowledge about how to write up investigative work including writing a hypothesis, identifying variable, analysing results including graph work and making a conclusion and evaluation. These skills are important for required practicals carried out in Year 10 and 11.</p>
Spaced Interleaving:	<p>Our curriculum allows us to move to unrelated content and return to it later. Biology, Chemistry and Physics topics are spaced between each other which enables knowledge to be revisited throughout the year. This gives opportunities for recalling specific learning. For example, the transition to GCSE topics requires recalling specific knowledge that has been learned throughout the whole of Key Stage 3. The revision and projects topics require recall of previous knowledge, which has to be applied to different concepts. General investigative work is included in most topics throughout the year, giving students the opportunity to revisit and practice these skills on a regular basis.</p>

Student Needs:	SEND:	All sessions will be differentiated for all students within the learning session including those with SEND needs. Teaching strategies for SEND students may include repetition of key words or ideas, modelling processes or theories to enable all students to grasp the fundamental ideas, revisiting of previous content to ensure full knowledge and understanding has been maintained and to eliminate any content misconceptions. Further strategies will include identifying students who are struggling, after the completion of assessments, and then providing appropriate intervention for them to enhance their learning. This intervention may include one to one learning sessions or small group working sessions where more time can be spent using bespoke strategies for that particular student to help them to improve. GCSE science pathways will be looked at, at the appropriate time, to make sure that all SEND students are following a route that will enable them to be successful.	Context	The content covered allows students to see a wide range of uses and careers for science and students will review some of the careers that could be open to them. Transient employment or low paid jobs is high for the parents of our students. Students will cover work on genes to understand how this links to their health and therefore we will support students in being healthier. Students will understand how technology creates wealth through studies of forces and electricity, and how different materials are created.
	LPA:	All sessions have differentiated activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra support for them. LPA students may also be given additional support to help complete activities. When homework is set,	HPA:	All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further. This

		LPA students may be given a differentiated activity to support them with completing the task.		activity may consist of using tier 3 vocabulary words in extended writing pieces or more comprehensive questions. The activities will also be activities whereby students' needs to use higher level thinking skills and use and understand higher level command words such as compare or discuss. AQA exemplar exam questions may be used to give students practice with the types of questions they will experience at GCSE.
Extracurricular:	Visit to a factory to see how glass is blown/ ceramics are made STEM club- Building a streamlined car to see how fast it will go Visit to the BIG BANG fair Visit to Nature Reserve to study the abundance of certain organisms using GCSE skills Outdoor physics project to build a rocket and fire it Guest speakers and workshops- such as a midwife, scientist, nurse etc. University visits			
Literacy/Numeracy:	Vocab (tier 2/3):	<p>9A Genetics and Evolution 9E Making materials. Students will write a piece of genetic evolution with a list of tier 3 words that they must use. 9E will require students to use tier 3 words from 8G and use a range of tier 2 words to describe the results from their chemical reactions.</p> <p>9I Forces and Motion and 9B Plant Growth. 9I will start with students revisiting tier 3 words from 8K, 7K, and 7I. Students will link these words to the definitions at the start of the topic. 9B will focus more on tier 2 words to help describe the growth of a plant.</p> <p>9F Reactivity 9J Force Fields and Electromagnets.</p>	Reading:	<p>9A – Teacher led reading, students to have tier 3 words to help understand the text.</p> <p>9E – Students to choose their own text regarding ceramics/glass and list their own tier 3 words with definitions</p> <p>9I – Reading mathematical problems to extract the information necessary.</p> <p>9B – Skimming text to help construct a list of key nutrients of plant growth</p> <p>9F – Students to explain the steps they need to take to carry out the practical after reading instructions.</p> <p>9J - Reading mathematical problems to extract the information necessary.</p> <p>Reading instructions to carry out investigations. Review conclusions for analysis skills</p> <p>Reading mathematical problems to extract the information necessary.</p>

		<p>Revisit tier 2 words from 8G to describe the processes in carrying out the reaction.</p> <p>9J will add a tier 3 matching activity to cover 7J words and add ones relating to magnetism</p> <p>9C Biology revision and projects 9G Chemistry revision and projects.</p> <p>Both topics will use tier 2 + 3 words from KS3. Students will plan and carry out practical investigations to apply I range of these.</p> <p>9K Physics revision and projects 9D Biology Transition to GCSE. 9K will use tier 2 + 3 words from KS3. Students will plan and carry out practical investigations to apply I range of these. 9D will have activities in the first 3 lessons where they will match tier 2 + 3 words to the definitions from their previous KS3 topics in order for students to begin to transition to KS4 content.</p> <p>9H Chemistry Transition to GCSE 9L Physics Transition to GCSE.</p> <p>Both topics will have activities in the first 3 lessons in each where they will match tier 2 + 3 words to the definitions from their previous KS3 topics in order for students to begin to transition to KS4 content.</p>		
	Writing:	Extended piece of writing convincing arguments and writing	Numeracy:	Review ratios for genetics

for audience. Example answers to be provided to support writing (9A)

Exit ticket writing tasks in every topic

Exam style questions that require extended answers.

Practical write up on displacement reactions, including method, conclusion and evaluation. Sub headings given to break writing task down into manageable chunks

Writing task describing methods and techniques within project work. Examples given to support pupils with writing and structuring of answers. (9C) (9G)

Answering QWC example assessment questions on KS3 knowledge. Opportunity to fix it after teacher feedback, and comparing with peers (9C)(9G)

Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and writing frames available for support (9D).

Forces and motion calculations. How can we make motion visual through graphs?

Proportionality – graphs to show this for electromagnetism

Quantitative analysis of data

Scales. Quantitative analysis of data. Microscope work on scales and calculations

Appreciation of number size and the units that are best suited.

Practice:	Mass:	End of topic Assessment for each topic	Distributed:	<p>Exit tickets</p> <p>Quick quizzes</p> <p>Starters and plenaries throughout each topic that reviews previous learning.</p> <p>Practicals – writing up method and analysing results</p> <p>Reflection of learning – pupils given opportunities throughout the topics to revisit previous learning and also think about how to improve, using quick quizzes and marked exit tickets to do this</p> <p>Stretch opportunities with extended writing tasks</p>
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KS4 – Year 10 Year Plan

Intent

Aims:	<ul style="list-style-type: none"> To be able to build on their knowledge gained during the KS3 programme and to apply this knowledge to the topics studied To develop their practical skills further, being more confident and being able to apply their knowledge in this situation To be able to build on their reading, writing and numeracy skills through a range of scientific activities Prepare for KS4 examinations, focusing on revision skills and exam technique.
Academy values:	<ul style="list-style-type: none"> Ambitious - Students are able to access the content at their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment. Brave – Student will have to be brave and feel confident about learning new skills and building on skills that they already possess. Student will have to be brave by not being afraid to get things wrong. Kind – Students will have to be kind to themselves about learning challenging concepts and using skills that they may struggle with

Units of Study:

Unit/Topic B1	Content:	Cell Biology	Spec Content:	<p>4.1.1.1 Eukaryotes and prokaryotes</p> <p>4.1.1.2 Animal and plant cells</p>
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				<ul style="list-style-type: none"> 4.1.1.3 Cell specialisation 4.1.1.4 Cell differentiation 4.1.1.5 Microscopy 4.1.2.1 Chromosomes 4.1.2.2 Mitosis and the cell cycle 4.1.2.3 Stem cells 4.1.3.1 Diffusion 4.1.3.2 Osmosis 4.1.3.3 Active transport
	Key Concepts:	The structure and function of plant and animal cells.	Powerful Knowledge:	Students will gain a knowledge of the building blocks for life. How the smallest organisms function. How can we manipulate the genetic code and what positives and negatives this has?
Unit/Topic B2	Content:	Organisation	Spec Content:	<ul style="list-style-type: none"> 4.2.1 Principles of organisation 4.2.2.1 The human digestive system 4.2.2.2 The heart and blood vessels 4.2.2.3 Blood 4.2.2.4 Coronary heart disease: a non-communicable disease 4.2.2.5 Health issues 4.2.2.6 The effect of lifestyle on some non-communicable diseases 4.2.2.7 Cancer 4.2.3.1 Plant tissues 4.2.3.2 Plant organ system
	Key Concepts:	The structure and organisation of the human body from cell to organ system.	Powerful Knowledge:	Students will be able to link cells to tissues to organs and understand how a range of organs work in the digestive and circulatory system.
Unit/Topic B3	Content:	Infection and Response	Spec Content:	<ul style="list-style-type: none"> 4.3.1.1 Communicable (infectious) diseases 4.3.1.2 Viral diseases 4.3.1.3 Bacterial diseases 4.3.1.4 Fungal diseases 4.3.1.5 Protist diseases 4.3.1.6 Human defence systems 4.3.1.7 Vaccination 4.3.1.8 Antibiotics and painkillers

				<p>4.3.1.9 Discovery and development of drugs</p> <p>4.3.2.1 Producing monoclonal antibodies</p> <p>4.3.2.2 Uses of monoclonal antibodies</p> <p>4.3.3.1 Detection and identification of plant diseases</p> <p>4.3.3.2 Plant defence responses</p>
	Key Concepts:	The structure and function of pathogens that can invade the human body and how the body then responds to fight off infection using the immune system.	Powerful Knowledge:	<p>Students should be able to explain how diseases caused by viruses, bacteria, protists and fungi are spread in animals and plants.</p> <p>Students should be able to explain how the spread of diseases can be reduced or prevented.</p>
Unit/Topic B4	Content:	Bioenergetics	Spec Content:	<p>4.4.1.1 Photosynthetic reaction</p> <p>4.4.1.2 Rate of Photosynthesis</p> <p>4.4.1.3 Uses of glucose from photosynthesis</p> <p>4.4.2.1 Aerobic and anaerobic respiration</p> <p>4.4.2.2 Response to exercise</p> <p>4.4.2.3 Metabolism</p>
	Key Concepts:	Metabolism and the processes that maintain the balance in the body such as Respiration and the synthesis of proteins.	Powerful Knowledge:	<p>Photosynthesis is represented by the equation: carbon dioxide + water → glucose + oxygen</p> <p>Students will understand how this is the basis for much of the life on earth.</p>
Unit/Topic B5	Content:	Homeostasis and Response	Spec Content:	<p>4.5.1 Homeostasis</p> <p>4.5.2 The human nervous system</p> <p>4.5.2.2 The brain</p> <p>4.5.2.3 The eye</p> <p>4.5.2.4 Control of body temperature</p> <p>4.5.3.1 Human endocrine system</p> <p>4.5.3.2 Control of blood glucose concentration</p> <p>4.5.3.3 Maintaining water and nitrogen balance in the body</p> <p>4.5.3.3 Hormones in human reproduction</p> <p>4.5.3.4 Contraception</p> <p>4.5.3.5 The use of hormones to treat infertility</p> <p>4.5.3.6 Feedback systems</p> <p>4.5.4 Plant hormones</p> <p>4.5.4.1 Control and coordination</p>

				4.5.4.2 Use of plant hormones
	Key Concepts:	The process of homeostasis in the human body and how our bodies respond to changes such as hormone level changes and glucose level changes.	Powerful Knowledge:	Students will be able to the regulation of the internal conditions. These include control of: blood glucose concentration, body temperature, water levels Students should be able to describe the roles of hormones in human reproduction, including the menstrual cycle. An appreciation on how they can ensure they are healthy
Unit/Topic C1	Content:	Atomic Structure and the Periodic Table	Spec Content:	5.1.2.3 Metals and non-metals 5.1.2.4 Group 0 5.1.2.5 Group 1 5.1.2.6 Group 7 4.1.3.1 Comparison with Group 1 elements 4.1.3.2 Typical properties
	Key Concepts:	The structure of the atom and the composition of the Periodic Table.	Powerful Knowledge:	What is an atom and how we use this building block and predict properties based on our knowledge. Students will gain knowledge of basic lab techniques.
Unit/Topic C2	Content:	Bonding, structure and the properties of matter	Spec Content:	5.2.1.1 Chemical bonds 5.2.1.2 Ionic bonding 5.2.1.3 Ionic compounds 5.2.1.4 Covalent bonding 5.2.1.5 Metallic bonding 5.2.2.1 The three states of matter 5.2.2.2 State symbols 4.2.4.1 Sizes of particles and their properties 4.2.4.2 Uses of nanoparticles 5.2.2.3 Properties of ionic compounds 5.2.2.4 Properties of small molecules 5.2.2.5 Polymers 5.2.2.6 Giant covalent structures 5.2.2.7 Properties of metals and alloys 5.2.2.8 Metals as conductors 5.2.3.1 Diamond 5.2.3.2 Graphite

	Key Concepts:	The different types of bonding that occurs between atoms and elements and the structure and properties of the new materials made.	Powerful Knowledge:	Why do we have thousands of chemicals yet only 92 naturally occurring elements. Students will understand why chemicals react and their likely properties. How these properties can be used to make new materials
Unit/Topic C3	Content:	Quantitative Chemistry	Spec Content:	5.3.1.1 Conservation of mass and balanced chemical equations 5.3.1.2 Relative formula mass 5.3.1.3 Mass changes when a reactant or product is a gas 5.3.1.4 Chemical measurements 5.3.2.1 Moles 5.3.2.2 Amounts of substances in equations 5.3.2.3 Using moles to balance equations 5.3.2.4 Limiting reactants 5.3.2.5 Concentration of solutions 4.3.3.1 Percentage yield 4.3.3.2 Atom economy 4.3.4 Using concentrations of solutions in mol/dm ³ 4.3.5 Use of amount of substance in relation to volumes of gases
	Key Concepts:	Equations used to calculate amounts, concentrations and masses of chemicals and elements.	Powerful Knowledge:	Students will be able to carry out a range of calculations to work out the number of atoms, the mass change, the elements in a compound.
Unit/Topic C4	Content:	Chemical changes	Spec Content:	5.4.1.1 Metal oxides 5.4.1.2 The reactivity series 5.4.1.3 Extraction of metals and reduction 5.4.1.4 Oxidation and reduction in terms of electrons (HT only) 5.4.2.1 Reactions of acids with metals 5.4.2.2 Neutralisation of acids and salt production 5.4.2.3 Soluble salts 5.4.2.4 The pH scale and neutralisation 4.4.2.5 Titrations 5.4.2.5 Strong and weak acids (HT only) 5.4.3.1 The process of electrolysis 5.4.3.2 Electrolysis of molten ionic compounds

				5.4.3.3 Using electrolysis to extract metals 5.4.3.4 Electrolysis of aqueous solutions 5.4.3.5 Representation of reactions at electrodes as half equations (HT only)
	Key Concepts:	The chemical changes that take place during chemical reactions such as colour changes and the production of gasses.	Powerful Knowledge:	Students will understand key reactions of metals with acids and how to purify a metal through electrolysis. Applying their understanding to make predictions on other metal reactions.
Unit/Topic C5	Content:	Energy changes	Spec Content:	5.5.1.1 Energy transfer during exothermic and endothermic reactions 5.5.1.2 Reaction profiles 5.5.1.3 The energy change of reactions 4.5.2.1 Cells and batteries 4.5.2.2 Fuel cells
	Key Concepts:	The energy changes that take place during chemical reactions such as a temperature which can result in an endothermic or exothermic change.	Powerful Knowledge:	Students will understand the different types of reaction in terms of energy changes. They will be able to calculate how much energy is transferred to and from the surroundings by looking at bond energies.
Unit/Topic C6	Content:	The rate and extent of chemical change	Spec Content:	5.6.1.1 Calculating rates of reactions 5.6.1.2 Factors which affect the rates of chemical reactions 5.6.1.4 Catalysts 5.6.2.1 Reversible reactions 5.6.2.2 Energy changes and reversible reactions 5.6.2.3 Equilibrium 5.6.2.4 The effect of changing conditions on equilibrium 5.6.2.5 The effect of changing concentration 5.6.2.6 The effect of temperature changes on equilibrium 5.6.2.7 The effect of pressure changes on equilibrium
	Key Concepts:	The ability to calculate the rate of chemical reaction and explain what factors affect the rate of chemical reaction.	Powerful Knowledge:	Students will work on how to change the rate of reaction. Carrying out far tests to vary reaction conditions.
Unit/Topic P1	Content:	Energy	Spec Content:	6.1.1.1 Energy stores and systems

				6.1.1.2 Changes in energy 6.1.1.3 Energy changes in systems 6.1.1.4 Power 6.1.2.1 Energy transfers in a system 6.1.2.2 Efficiency 6.1.3 National and global energy resources
	Key Concepts:	The different energy stores available and the different ways that energy can be transferred..	Powerful Knowledge:	Students will gain an understanding of the 9 energy stores. How these can vary but total energy is maintained. The main energy resources available for use on Earth include: fossil fuels (coal, oil and gas), nuclear fuel, bio-fuel, wind, hydroelectricity, geothermal, the tides, the Sun and water waves.
Unit/Topic P2	Content:	Electricity	Spec Content:	6.2.1.1 Standard circuit diagram symbols 6.2.1.2 Electrical charge and current 6.2.1.3 Current, resistance and potential difference 6.2.1.4 Resistors 6.2.2 Series and parallel circuits 6.2.3.1 Direct and alternating potential difference 6.2.3.2 Mains electricity 6.2.4.1 Power 6.2.4.2 Energy transfers in everyday appliances 6.2.4.3 The National Grid 4.2.5.1 Static charge 4.2.5.2 Electric fields
	Key Concepts:	Building circuits and measuring voltage and current in circuits along with calculating resistance as some of the basics.	Powerful Knowledge:	Students will gain an understanding of key measurements and their definitions in electricity. Mains electricity has a frequency of 50 Hz and is 230 V. The National Grid is a system of cables and transformers linking power stations to consumers.
Unit/Topic P3	Content:	Particle model of matter	Spec Content:	6.3.1.1 Density of materials 6.3.1.2 Change of state 6.6.2.1 Internal energy

				6.3.2.2 Temperature change in a system and specific heat capacity 6.3.2.3 Changes of state and specific latent heat 6.3.3.1 Particle motion in gases 4.3.3.2 Pressure in gases 4.3.3.3 Increasing the pressure of a gas
	Key Concepts:	The structure of particles in materials such as solids, liquids and gasses. How to calculate density and apply it to floating and sinking.	Powerful Knowledge:	Students should be able to recognise simple diagrams to model the difference between solids, liquids and gases. Students should be able to describe how, when substances change state. An appreciation for specific latent heat of a substance
Unit/Topic P4	Content:	Atomic structure	Spec Content:	6.4.1.1 The structure of the atom 6.4.1.2 Mass number, atomic number and isotopes 6.4.1.3 The development of the model of the atom 6.4.2.1 Radioactive decay and nuclear radiation 6.4.2.2 Nuclear equations 6.4.2.3 Half-lives and the random nature of radioactive decay 6.4.2.4 Radioactive contamination 4.4.3 Hazards and uses of radioactive emissions and of background Radiation 4.4.3.1 Background radiation 4.4.3.2 Different half-lives of radioactive isotopes 4.4.3.3 Uses of nuclear radiation 4.4.4.1 Nuclear fission 4.4.4.2 Nuclear fusion
	Key Concepts:	The structure of the atom. Radioactive decay and the dangers of radiation.	Powerful Knowledge:	Students will learn about radioactive decay. Radioactive contamination is the unwanted presence of materials containing radioactive atoms on other materials.

Implementation

Progression from Year 9:

Pupils will build upon the following topics studied in Year 9:

	<p>Biology - Cells and organisation, The skeletal and muscular systems, Nutrition and digestion, Gas exchange systems , Reproduction, Photosynthesis, Cellular respiration, Relationships in an ecosystem, Inheritance, chromosomes, DNA and genes. Chemistry Chemistry - The particulate nature of matter , Atoms, elements and compounds, Pure and impure substances, Chemical reactions, The periodic table, Earth and atmosphere</p> <p>Physics – Energy, Energy changes and transfers, Describing motion, Forces, Sound waves, Light waves, Electricity (current and static), Magnetism, Particle model, Space physics.</p>		
Progression to Year 11:	<p>Students are required to have a good grasp of the underlying paper one topics in order to understand the content in the paper two topics which are mainly covered on Year 11. If they have mastered the building blocks of these topics, it already leads them in good stead for a successful Year 11. The basics of forces covered in KS3 will be built upon even further in P5 Forces, therefore having a good knowledge of the basics will be advantageous to students. Students need to have a good understanding of bonding within compounds in order to apply their knowledge to C7 Organic chemistry. Sound knowledge of inheritance, chromosomes, DNA and genes covered in KS3 would be highly beneficial to apply during the topic B6 Inheritance, variation and evolution. A general knowledge of what we do to sustain our planet in terms of waste disposal, use of materials and water usage would also be useful when looking at topics C10 Using resources and B7 Ecology. Students will have covered the foundations of P6 Waves and P7 Magnetism and electromagnetism in KS3, so any recollection of this would be highly useful for these topics. Students should have now learnt what is needed from them for required practicals write ups, which will be continued to be worked on and improved during Year 11.</p>		
Spaced Interleaving:	<p>Our curriculum allows us to move to unrelated content and return to it later. Biology, Chemistry and Physics topics are spaced between each other which enables knowledge to be revisited throughout the year. This gives opportunities for recalling specific learning. For example, the knowledge gained in B1 Cell Biology will be revisited and used again later on in the year in topic B2 Organisation and B4 Bioenergetics. Topic C1 Atomic Structure and Periodic Table will be referred to during topic C2 Bonding, Structure and properties of matter and P4 Atomic Structure. The Chemistry topics C1 and C2 being the topics that bind all of the Chemistry knowledge together. The techniques and skills learned within the Physics topics are revisited throughout the year e.g. mathematical skills used with topic P1 Energy and P2 Electricity. General investigative work, including required practicals, are included in most topics throughout the year, giving students the opportunity to revisit and practice these skills on a regular basis.</p>		
Student Needs:	SEND:	<p>All sessions will be differentiated for all students within the learning session including those with SEND needs. Teaching strategies for SEND students may include repetition of key words or ideas, modelling processes or theories to enable all students to grasp the fundamental ideas, revisiting of previous content to ensure full knowledge and understanding has been maintained and to eliminate any content misconceptions. Further strategies will include identifying students who are struggling, after</p>	<p>Context</p> <p>The content covered allows students to see a wide range of uses and careers for science and students will review some of the careers that could be open to them. Students are going to appreciate the role of science in local employment to include water treatment (Minworth). Cement (tarmac in Solihull and across Derby). HS2 (apprenticeship in Birmingham). Cells (fertility clinic in Tamworth) Transient employment or low paid jobs is high for the parents of our students. Students will cover work on digestion and muscles and therefore we will support students in being healthier.</p>

		the completion of assessments, and then providing appropriate intervention for them to enhance their learning. This intervention may include one to one learning sessions or small group working sessions where more time can be spent using bespoke strategies for that particular student to help them to improve.		
	LPA:	All sessions have differentiated activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra support for them. LPA students may also be given additional support to help complete activities. When homework is set, LPA students may be given a differentiated activity to support them with completing the task.	HPA:	All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further. Many HPA students will complete the Triple award course and will complete the Higher tier exam papers.
Extracurricular:	<p>Visit to a Power Plant or Hydroelectric plant to see how energy is harnessed</p> <p>Visit to the Science museum in London to look at the structure of the human body</p> <p>Joint project with DT to build circuit boards</p> <p>Film Club to watch Contagion and appreciate how devastating an impact a virus or bacterium can have on the human population Students will review COVID-19, both in terms of the virus itself and the effect on society and the economy</p> <p>Joint project with PE to look at the impact of sport/respiration on the human body</p> <p>Joint project with History to look at the historical view about the atom</p>			
Literacy/Numeracy:	Vocab (tier 2/3):	B1. Cell biology C1. Atomic structure and the periodic table P1. Energy are rich in tier 3 vocabulary. Link back to 7A, 8F, 9I and 8K. Students will be given a list of new key words at the start of the topic to practise. Tier 2+3 words will be given to the students and these definitions for first homework will be checked.	Reading:	B1 - Reading for research for the organelles within eukaryotic and prokaryotic cells. C1 – Reading for analysis for the atomic structure. P1 – Reading to reinforce the tier 3 vocabulary that will be used throughout the energy topic Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response B2 – Reading for analysis in order to link the cell functions back to cell structure from the previous term

		<p>Before the end of topic tests, the new vocabulary will be revised.</p> <p>B2. Organisation</p> <p>C2. Bonding, structure, and the properties of matter.</p> <p>B2 – Homework – Some tier 2/3 vocabulary from 8A for the first homework.</p> <p>This term will focus on tier 2/3 vocabulary for food-based tests required practical.</p> <p>C2 – Start with recap of tier 2/3 vocabulary from 8F Introduce new tier 2/3 vocabulary related to atomic bonds.</p> <p>C2. Bonding, structure, and the properties of matter</p> <p>P2. Electricity</p> <p>P2 – Required practical in P2 to investigate I–V characteristics. Review tier 2 words from last term’s required practical and use 7J tier 3 vocabulary.</p> <p>B3. Infection and response, C3. Quantitative chemistry</p> <p>P3. Particle model of matter</p> <p>B3 – will use some tier 3 words from 8D, the focus is to ensure correct tier 3 words are used to explain the differences between fungi, bacteria, and viruses.</p> <p>C3 – requires few additional tier 3 vocabulary (Avogadro and mole)</p> <p>P3 – Revise key words from 7G particle model. Explore how these can be used scientifically through the reading task.</p> <p>Practical tier 2 words for density required practical.</p>		<p>C2 - Concentrate on why and how questions after reading the text in order to support the students in explaining the different types of bonding</p> <p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p> <p>P2 - Teacher led reading through text to analysis how definitions of voltage, current, resistance and put into context.</p> <p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p> <p>B3 - Reading for research on bacteria and virus focusing on how each affects health</p> <p>C3 – Reading to focus on steps to complete calculations.</p> <p>P3 – Reading on practical steps to be taken. Questions to focus on assessing this knowledge</p> <p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p> <p>B4 – Reading for analysis. Read how trees affect the amount of oxygen and carbon dioxide (not always positive for the atmosphere)</p> <p>C4 + C5 – Reading to focus on steps to complete calculations.</p> <p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p> <p>P4 - Teacher led reading through text to analysis how matter is made up.</p> <p>B5 - Reading for research for the processes of how the body regulates blood sugar, water levels, and body temperature</p> <p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p>
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		<p>B4 – first homework is tier 3 words from 8B and 8C. Recap tier 2 vocabulary for light intensity required practical.</p> <p>C4 – is heavily reliant on tier 3 words from 9F, 7F, and P2 (opportunity to return to P2 understanding of current and voltage). Set this for homework and DNA.</p> <p>C5 – is a small topic. Two tier 3 words. Exothermic and endothermic. Recap tier 2 vocabulary for heat energy required practical.</p> <p>P4 – New tier 3 vocabulary for radiation. DNA to cover 7H tier 3 vocabulary.</p> <p>B5 – Revisit tier 2+3 vocabulary for the required practical Tier 3 words given for a writing activity for nervous system.</p> <p>C6 – first homework to complete definitions for 9F. DNA to repeat those from C2.</p>		
	<p>Writing:</p>	<p>Answering QWC example assessment questions. Opportunity to fix it after teacher feedback, and comparing with peers</p> <p>Writing a scientific report as part of the GCSE required practicals. Writing frames and examples given to support this</p> <p>Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and</p>	<p>Numeracy:</p>	<p>B1 – Prefixes centi, milli, micro, nano C1 – Looking at patterns P1 - Prefixes centi, milli, micro, nano B2 - Students should understand the principles of sampling as applied to scientific data, including epidemiological data. C2 – Patterns in the numbers of electrons to predict reactions P2 - Using equations for electricity. Rearranging skills and steps to complete each time B3 – Appreciation of scale C3 – Steps to complete equations. Cover scientific notation. Avogadro’s constant $6 \times 10^{23} \text{ mol}^{-1}$ P3 – Appreciation of how numerator and denominator will change the figure for density</p>

		writing frames available for support		<p>B4 – Appreciation for the scale of the atmosphere.</p> <p>C4 + C5 – Steps to complete equations. Cover scientific notation</p> <p>P4 – Appreciation of atomic scale and application to two different models to explain the atom structure.</p> <p>B5 – Estimate how long it takes for a nerve impulse to travel</p>
Practice:	Mass:	End of topic Assessments for each topic	Distributed:	<p>Quick quizzes and example exam questions</p> <p>Starters and plenaries throughout each topic that reviews previous learning.</p> <p>Required practical write ups</p> <p>Reflection of learning – pupils given opportunities throughout the topics to revisit previous learning and also think about how to improve, using quick quizzes and marked example exam questions</p> <p>Stretch opportunities with extended writing tasks</p>

KS4 – Year 11 Year Plan

Intent

Aims:	<ul style="list-style-type: none"> To be able to build on their knowledge gained during Year 10 and to apply this knowledge to the topics studied To develop their practical skills further, being more confident and being able to apply their knowledge in this situation To be able to build on their reading, writing and numeracy skills through a range of scientific activities Prepare for KS4 examinations, focusing on revision skills and exam technique.
Academy values:	<ul style="list-style-type: none"> Ambitious - Students are able to access the content at their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application. Students learn through a range of activities, including practical work where possible. All students will be stretched through the various forms of new learning and assessment. Brave – Student will have to be brave and feel confident about learning new skills and building on skills that they already possess. Student will have to be brave by not being afraid to get things wrong. Kind – Students will have to be kind to themselves about learning challenging concepts and using skills that they may struggle with

Units of Study:

Unit/Topic B6	Content:	Inheritance, variation and evolution	Spec Content:	4.6.1.1 Sexual and asexual reproduction 4.6.1.2 Meiosis 4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction 4.6.1.3 DNA and the genome 4.6.1.5 DNA structure 4.6.1.4 Genetic inheritance 4.6.1.5 Inherited disorders 4.6.1.6 Sex determination 4.6.2.1 Variation 4.6.2.2 Evolution 4.6.2.3 Selective breeding 4.6.2.4 Genetic engineering 4.6.2.5 Cloning 4.6.3.1 Theory of evolution 4.6.3.2 Speciation 4.6.3.3 The understanding of genetics 4.6.3.1 Evidence for evolution 4.6.3.2 Fossils 4.6.3.3 Extinction 4.6.3.4 Resistant bacteria 4.6.4 Classification of living organisms
	Key Concepts:	. The terms `inheritance`, `evolution` and `variation` and the way that humans, for example, have evolved through inheriting different characteristics and features that cause variation. the ecosystem that they live in.	Powerful Knowledge:	Students will understand the roles of the two types of cell division. One for growth, one for new life.
Unit/Topic B7	Content:	Ecology	Spec Content:	4.7.1.1 Communities 4.7.1.2 Abiotic factors 4.7.1.3 Biotic factors 4.7.1.4 Adaptations 4.7.2.1 Levels of organisation 4.7.2.2 How materials are cycled 4.7.2.3 Decomposition 4.7.2.4 Impact of environmental change 4.7.3.1 Biodiversity 4.7.3.2 Waste management 4.7.3.3 Land use 4.7.3.4 Deforestation 4.7.3.5 Global warming

				<p>4.7.3.6 Maintaining biodiversity</p> <p>4.7.4.1 Trophic levels</p> <p>4.7.4.2 Pyramids of biomass</p> <p>4.7.4.3 Transfer of biomass</p> <p>4.7.5.1 Factors affecting food security</p> <p>4.7.5.2 Farming techniques</p> <p>4.7.5.3 Sustainable fisheries</p> <p>4.7.5.4 Role of biotechnology</p>
	Key Concepts:	The study of organisms and their habitats and the ecosystem that they live in.	Powerful Knowledge:	<p>Students should be able to explain how organisms are adapted to live in their natural environment.</p> <p>Humans reduce the amount of land available for other animals and plants by building, quarrying, farming and dumping waste. Students should be able to describe some of the biological consequences of global warming.</p>
Unit/Topic C7	Content:	Organic Chemistry	Spec Content:	<p>5.7.1.1 Crude oil, hydrocarbons and alkanes</p> <p>5.7.1.2 Fractional distillation and petrochemicals</p> <p>5.7.1.3 Properties of hydrocarbons</p> <p>5.7.1.4 Cracking and alkenes</p> <p>4.7.2.1 Structure and formulae of alkenes</p> <p>4.7.2.2 Reactions of alkenes</p> <p>4.7.2.3 Alcohols</p> <p>4.7.2.4 Carboxylic acids</p> <p>4.7.3.1 Addition polymerisation</p> <p>4.7.3.2 Condensation polymerisation</p> <p>4.7.3.3 Amino acids (HT only)</p> <p>4.7.3.4 DNA (deoxyribonucleic acid) and other naturally occurring polymers</p>
	Key Concepts:	. The structure and uses of Hydrocarbons, including Alkanes, Alkenes and Alcohols.	Powerful Knowledge:	<p>Students will learn about how crude oil was created, how it is extracted and how we separate out fraction (separating techniques from term 1) Crude oil is a finite resource found in rocks. What do we have to replace it?</p>
Unit/Topic C8	Content:	Chemical Analysis	Spec Content:	<p>5.8.1.1 Pure substances</p> <p>5.8.1.2 Formulations</p> <p>5.8.1.3 Chromatography</p>

				<p>5.8.2.1 Test for hydrogen 5.8.2.2 Test for oxygen 5.8.2.3 Test for carbon dioxide 5.8.2.4 Test for chlorine 4.8.3.1 Flame tests 4.8.3.2 Metal hydroxides 4.8.3.3 Carbonates 4.8.3.4 Halides 4.8.3.5 Sulfates 4.8.3.6 Instrumental methods 4.8.3.7 Flame emission spectroscopy</p>
	Key Concepts:	Methods used, by scientists, to analyse and identify chemicals using reagents and chemical reactions.	Powerful Knowledge:	<p>Chromatography can be used to separate mixtures and can give information to help identify substances. The test for hydrogen. The test for oxygen. The test for carbon dioxide.</p>
Unit/Topic C9	Content:	Chemistry of the Atmosphere	Spec Content:	<p>5.9.1.1 The proportions of different gases in the atmosphere 5.9.1.2 The Earth's early atmosphere 5.9.1.3 How oxygen increased 5.9.1.4 How carbon dioxide decreased 5.9.2.1 Greenhouse gases 5.9.2.2 Human activities which contribute to an increase in greenhouse gases in the Atmosphere 5.9.2.3 Global climate change 5.9.2.4 The carbon footprint and its reduction 5.9.3.1 Atmospheric pollutants from fuels 5.9.3.2 Properties and effects of atmospheric pollutants</p>
	Key Concepts:	The structure of our atmosphere and how it has changed over time and is continuing to change due to changes in atmospheric gasses.	Powerful Knowledge:	Theories about what was in the Earth's early atmosphere and how the atmosphere was formed have changed and developed over time.
Unit/Topic C10	Content:	Using Resources	Spec Content:	<p>5.10.1.1 Using the Earth's resources and sustainable development 5.10.1.2 Potable water 5.10.1.3 Waste water treatment</p>

				<p>5.10.1.4 Alternative methods of extracting metals</p> <p>5.10.2.1 Life cycle assessment</p> <p>5.10.2.2 Ways of reducing the use of resources</p> <p>4.10.3.1 Corrosion and its prevention</p> <p>4.10.3.2 Alloys as useful materials</p> <p>4.10.3.3 Ceramics, polymers and composites</p> <p>4.10.4.1 The Haber process</p> <p>4.10.4.2 Production and uses of NPK fertilisers</p>
	Key Concepts:	How resources are obtained, produced and used effectively such as Aluminium to make Aluminium cans.	Powerful Knowledge:	<p>Natural resources, supplemented by agriculture, provide food, timber, clothing and fuels.</p> <p>Potable water is not pure water how do we ensure diseases don't spread through dirty water?</p> <p>The reduction in use, reuse and recycling of materials by end users reduces the use of limited resources, use of energy sources, waste and environmental impacts.</p> <p>Students should be able to evaluate ways of reducing the use of limited resources.</p>
Unit/Topic P5	Content:	Forces	Spec Content:	<p>6.5.1.1 scalar and vector quantities</p> <p>6.5.1.2 Contact and non-contact forces</p> <p>6.5.1.3 Gravity</p> <p>6.5.1.4 Resultant forces</p> <p>6.5.2 Work done and energy transfer</p> <p>6.5.3 Forces and elasticity</p> <p>4.5.4 Moments, levers and gears</p>
	Key Concepts:	The different types of forces that exist and Newton's Laws.	Powerful Knowledge:	<p>A force is a push or pull that acts on an object due to the interaction with another object. How forces affect movement and a range of examples for moving objects.</p> <p>The braking distance of a vehicle can be affected by adverse road and weather conditions and poor condition of the vehicle.</p>
Unit/Topic P6	Content:	Waves	Spec Content:	<p>6.6.1.1 Transverse and longitudinal wave</p> <p>6.6.1.2 Properties of waves</p>

				4.6.1.3 Reflection of waves 4.6.1.4 Sound waves 4.6.1.5 Waves for detection and exploration 6.6.2.1 Types of electromagnetic waves 6.6.2.2 Properties of electromagnetic waves 1 6.6.2.3 Properties of electromagnetic waves 2 6.6.2.4 Uses and applications of electromagnetic waves 4.6.2.5 Lenses 4.6.2.6 Visible light 4.6.3.1 Emission and absorption of infrared radiation 4.6.3.2 Perfect black bodies and radiation
	Key Concepts:	The Electromagnetic spectrum and the features and structure of the different types of waves.	Powerful Knowledge:	Electromagnetic waves are transverse waves that transfer energy from the source of the waves to an absorber. Going from long to short wavelength (or from low to high frequency) the groups are: radio, microwave, infrared, visible light (red to violet), ultraviolet, X-rays and gamma rays. Electromagnetic waves have many practical applications, students need to know examples for each.
Unit/Topic P7	Content:	Magnetism and electromagnetism	Spec Content:	6.7.1.1 Poles of a magnet 6.7.1.2 Magnetic fields 6.7.2.1 Electromagnetism 6.7.2.2 Fleming's left-hand rule 6.7.2.3 Electric motors 4.7.2.4 Loudspeakers 4.7.3.1 Induced potential 4.7.3.2 Uses of the generator effect 4.7.3.3 Microphones 4.7.3.4 Transformers
	Key Concepts:	How magnetism works and how electromagnets are made, including their uses.	Powerful Knowledge:	Students will know how to use movement and magnetic fields to create electricity and create movement using electricity and a magnetic field. Cover a range of uses for this and link back to energy stores.

Unit/Topic P8	Content:	Space	Spec Content:	4.8.1.1 Our solar system 4.8.1.2 The life cycle of a star 4.8.1.3 Orbital motion, natural and artificial satellites 4.8.2 Red-shift
	Key Concepts:	The life cycle of a star, the different planets and what observations can be made.	Powerful Knowledge:	Space – What is out there? How can we take measurements to further our knowledge?

Implementation

Progression from Year 10:	<p>Students are required to have a good grasp of the underlying paper one topics in order to understand the content in the paper two topics which are mainly covered on Year 11. If they have mastered the building blocks of these topics, it already leads them in good stead for a successful Year 11. The basics of forces covered in KS3 will be built upon even further in P5 Forces, therefore having a good knowledge of the basics will be advantageous to students. Students need to have a good understanding of bonding within compounds in order to apply their knowledge to C7 Organic chemistry. Sound knowledge of inheritance, chromosomes, DNA and genes covered in KS3 would be highly beneficial to apply during the topic B6 Inheritance, variation and evolution. A general knowledge of what we do to sustain our planet in terms of waste disposal, use of materials and water usage would also be useful when looking at topics C10 Using resources and B7 Ecology. Students will have covered the foundations of P6 Waves and P7 Magnetism and electromagnetism in KS3, so any recollection of this would be highly useful for these topics. Students should have now learnt what is needed from them for required practicals write ups, which will be continued to be worked on and improved during Year 11.</p>			
Progression to Post-16:	<p>Students are required to have a good grasp of the basics covered in the following areas listed. All of these areas are covered during GCSE. A good knowledge of the basics will ensure a successful start to KS5.</p> <p>Biology - Living organisms, Biodiversity, Exchange and transport, Cells, Biological molecules, Ecosystems, Control systems, Genetics and evolution and Energy for biological processes.</p> <p>Chemistry - Formulae, equations and amounts of substance, Atomic structure, Bonding and structure, Energetics, Kinetics, Equilibria, Redox, Inorganic chemistry and the periodic table, Organic chemistry and Modern analytical techniques.</p> <p>Physics - Vectors and scalars, Mechanics, Mechanical properties of matter, Electric circuits, Waves, Matter, Quantum and nuclear physics and Fields.</p>			
Spaced Interleaving:	<p>Our curriculum allows us to move to unrelated content and return to it later. Biology, Chemistry and Physics topics are spaced between each other which enables knowledge to be revisited throughout the year. This gives opportunities for recalling specific learning. For example, the knowledge gained in C7 Organic Chemistry will be utilised again later on in the year in topic C9 Chemistry of the atmosphere and C10 Using resources. Content covered in the Biology topic B7 Ecology is also revisited in C9 Chemistry of the atmosphere. The techniques and skills learned within the Physics topics are revisited throughout the year e.g. mathematical skills used with topic P5 Forces and P6 Waves. General investigative work, including required practicals, are included in most topics throughout the year, giving students the opportunity to revisit and practice these skills on a regular basis.</p>			
Student Needs:	SEND:	All sessions will be differentiated for all students within the learning session including those with SEND needs. Teaching strategies for SEND students may include repetition of key words or	Context	The content covered allows students to see a wide range of uses and careers for science and students will review some of the careers that could be open to them. Students are going to appreciate the role of science in local employment to include water treatment

		ideas, modelling processes or theories to enable all students to grasp the fundamental ideas, revisiting of previous content to ensure full knowledge and understanding has been maintained and to eliminate any content misconceptions. Further strategies will include identifying students who are struggling, after the completion of assessments, and then providing appropriate intervention for them to enhance their learning. This intervention may include one to one learning sessions or small group working sessions where more time can be spent using bespoke strategies for that particular student to help them to improve.		(Minworth). Cement (Tarmac in Solihull and across Derby). HS2 (apprenticeship in Birmingham). Cells (fertility clinic in Tamworth) Transient employment or low paid jobs is high for the parents of our students. Students will cover work on digestion and muscles and therefore we will support students in being healthier.
	LPA:	All sessions have differentiated activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra support for them. LPA students may also be given additional support to help complete activities. When homework is set, LPA students may be given a differentiated activity to support them with completing the task.	HPA:	All sessions have stretch and challenge activities built into the sessions. Students will always be prompted to access those tasks/questions that will provide that extra challenge for them. HPA students may also be given additional extension activities to extend and strengthen their knowledge. When homework is set, HPA students may be given a differentiated activity to stretch their knowledge and understanding further. Many HPA students will complete the Triple award course and will complete the Higher tier exam papers.
Extracurricular:	<p>Making sweets using esters made using organic materials with DT department</p> <p>Visit to a University Laboratory or a Forensics lab to see how to test for substances such as drugs.</p> <p>Science film club to watch, for example, The day after tomorrow- to learn about the impact of climate changes and changes to our atmosphere</p> <p>Visit to a Nature reserve or a joint trip with Geography to study an ecosystem</p>			
Literacy/Numeracy:	Vocab (tier 2/3):	P5. Forces, C7. Organic chemistry. P5 – Link back to 9I with these definitions to be set for homework. New key words for	Reading:	P5 – Big picture question regarding transport. Use news article to unpick tier 2 words to support students in their responses. C7 - Research work on how oil refineries work

		<p>2nd lesson DNA – scalar and vector. Apply these in the writing task.</p> <p>C7 – will use DNA for tier 3 naming convention for alkanes and alkenes</p> <p>B6. Inheritance, variation and evolution</p> <p>C8. Chemical analysis</p> <p>P6. Waves</p> <p>B6 – 1st homework is to complete definitions of the tier 3 words from 9A.</p> <p>Use tier 3 words in extended writing tasks</p> <p>C8 – Recap of tier 3 vocabulary from 7E. Students to revisit tier 2 and 3 vocabulary for planning of practicals to support required practical.</p> <p>P6 – Recap tier 2/3 vocabulary from 7L + 8J. Plan required practical with new tier 2/3 vocabulary given such as period, wavelength, transverse, longitudinal.</p> <p>C9. Chemistry of the atmosphere</p> <p>C10. Using resources</p> <p>C9 – Link the tier 2/3 vocabulary from B4 (relating to photosynthesis) to C9.</p> <p>Opportunity to revise the equation from B4 topic.</p> <p>C10 – Fewer tier 3 vocabulary in this short topic. Work on tier 2/3 vocabulary with extended writing on water cycle and recycling.</p> <p>P7. Magnetism and electromagnetism</p> <p>B7. Ecology</p>		<p>Exam paper questions will be pulled apart to develop analysis skills and develop a logical order for the response</p> <p>B6 – Students to select a text on variation and evolution. Research and then why questions.</p> <p>C8 – Teacher led reading through text to analysis the steps for gas tests</p> <p>P6 - Analysis task checking that students know how to carry out the steps for waves practical</p> <p>C9 - Concentrate on why and how questions after reading the text in order to support the students in explaining how the atmosphere has evolved.</p> <p>C10 - Concentrate on why and how questions after reading the text in order to support the students in explaining the water cycle.</p> <p>P7 – Teacher led to support the logical explanation of how electricity is made.</p> <p>B7 - Use texts to develop summarising skills on ecosystems</p>
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	Writing:	<p>Answering QWC example assessment questions. Opportunity to fix it after teacher feedback, and comparing with peers</p> <p>Writing a scientific report as part of the GCSE required practicals. Writing frames and examples given to support this</p> <p>Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and writing frames available for support</p>	Numeracy:	<p>P5 - Using equations for electricity. Rearranging skills and steps to complete each time</p> <p>C7 – Patterns in the make up of alkanes and alkenes</p> <p>B6 – Appreciation of scale (cell and DNA)</p> <p>C8 – Ratios for chromatography</p> <p>P6 – Scientific notation. Using a calculator to support this.</p> <p>C9 – Percentages. Eg How many CO₂ molecules are there in 100000 molecules of air if it makes up 0.03%</p> <p>C10 – Balancing ionic charge (+2 how many electrons to form the atom)</p> <p>B7 – Mean, median, mode. Why do we have these 3 measures?</p> <p>P7 - Rearranging skills and steps to complete each time</p>
Practice:	Mass:	End of topic Assessments for each topic	Distributed:	<p>Quick quizzes and example exam questions</p> <p>Starters and plenaries throughout each topic that reviews previous learning.</p> <p>Required practical write ups</p> <p>Reflection of learning – pupils given opportunities throughout the topics to revisit previous learning and also think about how to improve, using quick quizzes and marked example exam questions</p> <p>Stretch opportunities with extended writing tasks</p>

5 Year Curriculum Week Plan

KS3 - Year 7

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn Term 1	7A Cells, tissues, organs and systems <ol style="list-style-type: none"> Doctors Past and present Life Processes Conventions in writing Organs 	7A Cells, tissues, organs and systems <ol style="list-style-type: none"> Microscopes 1 Microscopes 2 Tissues 	7A Cells, tissues, organs and systems <ol style="list-style-type: none"> Cells Organ systems Transplants Revision 	7A Cells, tissues, organs and systems <ol style="list-style-type: none"> Quick Quiz Revision Assessment 	7E Mixtures and Separation <ol style="list-style-type: none"> Mixtures and separation Writing a method Solutions 	7E Mixtures and Separation <ol style="list-style-type: none"> Evaporation Safety when heating Chromatography 	7E Mixtures and Separation <ol style="list-style-type: none"> Distillation Safe drinking water Quick Quiz Assessment
Autumn Term 2	7I Energy <ol style="list-style-type: none"> Energy and changes Energy from food Fair comparisons and ratios Energy transfers and stores 	7I Energy <ol style="list-style-type: none"> Fuels Summarising Other energy resources 	7I Energy <ol style="list-style-type: none"> Making Changes Using resources Quick Quiz/Revision Assessment 	7B – Sexual Reproduction in animals <ol style="list-style-type: none"> Animal sexual reproduction The escaped zoo animals The scientific method 	7B – Sexual Reproduction in animals <ol style="list-style-type: none"> Reproductive organs Becoming pregnant Making notes Gestation and birth 	7B – Sexual Reproduction in animals <ol style="list-style-type: none"> Growing up The work of zoos Quick quiz 	7B – Sexual Reproduction in animals <ol style="list-style-type: none"> Revision Assessment
Spring Term 1	7G The particle model <ol style="list-style-type: none"> Making comparisons 	7G The particle model <ol style="list-style-type: none"> Particles Brownian motion Diffusion 	7G The particle model <ol style="list-style-type: none"> Air pressure Waste 	7J Current and Electricity <ol style="list-style-type: none"> Discovering electricity 	7J Current and Electricity <ol style="list-style-type: none"> Series and parallel circuits Using tables 	7J Current and Electricity <ol style="list-style-type: none"> Using Electricity Quick quiz revision 	7J Current and Electricity <ol style="list-style-type: none"> Assessment Review

	<ul style="list-style-type: none"> 2. Solids liquids and gases 3. Sorting rubbish 4. Hypothesis and theories 		<ul style="list-style-type: none"> 10. Quick quiz/revisio n 11. Assessment † 	<ul style="list-style-type: none"> 2. Switches and current 3. Models in science 	<ul style="list-style-type: none"> 6. Changing the current 7. A world without electricity 		
Spring Term 2	7C Muscles and Bones <ul style="list-style-type: none"> 1. Fitness 2. Muscles and breathing 3. Muscles and blood 4. Scientific questions 	7C Muscles and Bones <ul style="list-style-type: none"> 5. Sentences 6. The skeleton 7. Muscles and moving 	7C Muscles and Bones <ul style="list-style-type: none"> 8. Drugs 9. Drugs and sport 10. Quick quiz/revisio n 11. Assessment † 	7F Acids and Alkalis <ul style="list-style-type: none"> 1. Chemistry in the home 2. Controlling risks 3. hazards 	7F Acids and Alkalis <ul style="list-style-type: none"> 4. Indicators 5. Acidity and alkalinity 6. Writing titles 7. Neutralisati on 	7F Acids and Alkalis <ul style="list-style-type: none"> 8. Danger at home 9. Neutralisation is daily life 10. Quick quiz 	7F Acids and Alkalis <ul style="list-style-type: none"> 11. Revision 12. Assessment nt
Summer Term 1	7K Forces <ul style="list-style-type: none"> 1. Different forces 2. Forces 3. Making notes 4. Springs 	7K Forces <ul style="list-style-type: none"> 5. Friction 6. Pressure 7. SI units 	7K Forces <ul style="list-style-type: none"> 8. Balanced and unbalance d forces 9. Safety standards 10. Quick quiz/revisio n 11. Assessment † 	7D Ecosystems <ul style="list-style-type: none"> 1. Charts and graphs 2. Exploring the world 3. Variation 	7D Ecosystems <ul style="list-style-type: none"> 4. Adaptation s 5. Effects of the environmen † 6. Paragraphs 7. Effects on the Environmen † 	7D Ecosystems <ul style="list-style-type: none"> 8. Nomads 9. Transfer in food chains 10. Quick quiz 	7D Ecosystems <ul style="list-style-type: none"> 11. Revision 12. Assessment nt
Summer Term 2	7H Atoms, elements and molecules <ul style="list-style-type: none"> 1. Our material world 2. Sorting resource data 	7H Atoms, elements and molecules <ul style="list-style-type: none"> 5. Facts and opinions 6. Metals and non-metals 	7H Atoms, elements and molecules <ul style="list-style-type: none"> 8. Chemical reactions 9. Problems with elements 	7L Sound <ul style="list-style-type: none"> 1. Animal sounds 2. Making sounds 3. Line graphs and 	7L Sound <ul style="list-style-type: none"> 4. Moving sounds 5. Detecting sounds 6. Remembering 7. Using sound 	7L Sound <ul style="list-style-type: none"> 8. Animals and noise 9. Comparing waves 10. Quick quiz 	7L Sound <ul style="list-style-type: none"> 11. Revision 12. Assessment nt

	3. The air we breathe 4. Earth's elements	7. Making compounds	10. Quick quiz/revision 11. Assessment	scatter graphs			
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KS3 - Year 8

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn Term 1	8A Food and Nutrition 1. Food and advertising 2. Nutrients 3. Uses of nutrients 4. Weighting and bias	8A Food and Nutrition 5. Balanced diets 6. Digestion 7. Surface area	8A Food and Nutrition 8. Absorption 9. Packaging and the law 10. Quick quiz/revision 11. Assessment	8E Combustion 1. Engines 2. Burning fuels 3. Oxidation	8E Combustion 4. Fire safety 5. Fair testing 6. Air pollution 7. Global warming	8E Combustion 8. Information and explanation 9. Reducing pollution 10. Quick Quiz	8E Combustion 11. Revision 12. Assessment
Autumn Term 2	8I Fluids 1. Exploring extremes 2. The particles model 3. Calculations with density 4. Changing state	8I Fluids 5. Pressure in fluids 6. Presenting information 7. Floating and sinking	8I Fluids 8. Drag 9. Humans at the extremes 10. Quick quiz/revision 11. Assessment	8B – Plants and their reproduction 1. Useful plants 2. Classification and biodiversity 3. Accuracy and estimates	8B – Plants and their reproduction 4. Types of reproduction 5. Pollination 6. Fertilisation and dispersal 7. Structuring paragraphs	8B – Plants and their reproduction 8. Germination and growth 9. Animals using plants 10. Quick Quiz	8B – Plants and their reproduction 11. Revision 12. Assessment
Spring Term 1	8F The periodic table 1. Fireworks	8F The periodic table	8F The periodic table	8J Light 1. Seeing things	8J Light 4. Reflection 5. Refraction	8J Light 8. Colour	8J Light 11. Revision

	<ol style="list-style-type: none"> 2. Daltons atomic model 3. Chemical properties 4. Using sentences 	<ol style="list-style-type: none"> 5. Mendeleev's table 6. Anomalous results 7. Physical trends 	<ol style="list-style-type: none"> 8. Chemical trends 9. Firework ban 10. Making compounds 11. Assessment 	<ol style="list-style-type: none"> 2. Light on the move 3. Drawings and convention 	<ol style="list-style-type: none"> 6. Cameras and eyes 7. Preparing a presentation 	<ol style="list-style-type: none"> 9. Invisibility cloaks 10. Quick Quiz 	<ol style="list-style-type: none"> 12. Assessment
Spring Term 2	8C Breathing and Respiration <ol style="list-style-type: none"> 1. Water sports and breathing 2. Aerobic respiration 3. Gas exchange system 4. Means and ranges 	8C Breathing and Respiration <ol style="list-style-type: none"> 5. Getting oxygen 6. Cause and effect 7. Comparing gas exchange 	8C Breathing and Respiration <ol style="list-style-type: none"> 8. Anaerobic respiration 9. Fitness training 10. Quick quiz/revision 11. Assessment 	8G Metals and their uses <ol style="list-style-type: none"> 1. Building up 2. Metal properties 3. Corrosion 	8G Metals and their uses <ol style="list-style-type: none"> 4. Describing materials 5. Metals and water 6. Quality evidence 7. Metals and acids 	8G Metals and their uses <ol style="list-style-type: none"> 8. Pure metals and alloys 9. Metals in art 10. Quick quiz 	8G Metals and their uses <ol style="list-style-type: none"> 11. Revision 12. Assessment
Summer Term 1	8K Energy Transfers <ol style="list-style-type: none"> 1. Living in the extremes 2. Temperature changes 3. Choosing language 4. Transferring energy 	8K Energy Transfers <ol style="list-style-type: none"> 5. Controlling transfers 6. Accuracy and precision 7. Power and efficiency 	8K Energy Transfers <ol style="list-style-type: none"> 8. Paying for energy 9. Keeping warm 10. Quick quiz/revision 11. Assessment 	8D Unicellular organisms <ol style="list-style-type: none"> 1. The black death 2. Unicellular or multicellular 3. Microscopic fungi 	8D Unicellular organisms <ol style="list-style-type: none"> 4. Modal verbs 5. Bacteria 6. Pie charts 7. Protoctists 	8D Unicellular organisms <ol style="list-style-type: none"> 8. Decomposers and carbon 9. Black death hypotheses 10. Quick quiz 	8D Unicellular organisms <ol style="list-style-type: none"> 11. Revision 12. Assessment
Summer Term 2	8H Rocks <ol style="list-style-type: none"> 1. Disaster 	8H Rocks	8H Rocks	8L Earth and Space	8L Earth and Space <ol style="list-style-type: none"> 4. Seasons 	8L Earth and Space <ol style="list-style-type: none"> 8. Beyond the solar system 	8L Earth and Space <ol style="list-style-type: none"> 11. Revision

	<ul style="list-style-type: none"> 2. Rocks and their uses 3. Igneous and metamorphic 4. Assessing sources 	<ul style="list-style-type: none"> 5. Weathering and erosion 6. Sedimentary rocks 7. Theories in geology 	<ul style="list-style-type: none"> 8. Materials in the earth 9. Living in danger 10. Rock types weathering 11. Assessment 	<ul style="list-style-type: none"> 1. Changing ideas 2. Gathering evidence 3. Scientific arguments 	<ul style="list-style-type: none"> 5. Magnetic earth 6. Gravity in space 7. Making comparisons 	<ul style="list-style-type: none"> 9. Studying space 10. Quick Quiz 	<ul style="list-style-type: none"> 12. Assessment
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KS3 - Year 9

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn Term 1	9A Genetics <ul style="list-style-type: none"> 1. Environmental variation 2. Inherited variation 	9A Genetics <ul style="list-style-type: none"> 3. DNA 4. Genes and extinction 5. Natural selection 	9A Genetics <ul style="list-style-type: none"> 6. Convincing arguments 7. Revision 8. Assessment 	9E Making Materials <ul style="list-style-type: none"> 1. About ceramics 2. Polymers 	9E Making Materials <ul style="list-style-type: none"> 3. Composite materials 4. Problems with materials 	9E Making Materials <ul style="list-style-type: none"> 5. Recycling materials 	9E Making Materials <ul style="list-style-type: none"> 6. Revision 7. Assessment
Autumn Term 2	9I Forces and motion <ul style="list-style-type: none"> 1. Forces and movement 2. Energy and movement 	9I Forces and motion <ul style="list-style-type: none"> 3. Speed 4. Turning forces 	9I Forces and motion <ul style="list-style-type: none"> 5. More machines 6. Revision 7. Assessment 	9B Plant growth <ul style="list-style-type: none"> 1. Reactions in plants 2. Plant adaptations 	9B Plant growth <ul style="list-style-type: none"> 3. Plant products 4. Growing crops 	9B Plant growth <ul style="list-style-type: none"> 5. Farming problems 6. Revision 	9B Plant growth <ul style="list-style-type: none"> 7. Assessment
Spring Term 1	9F Reactivity <ul style="list-style-type: none"> 1. Types of explosion 	9F Reactivity <ul style="list-style-type: none"> 3. Energy and reactions 	9F Reactivity <ul style="list-style-type: none"> 5. Extracting 	9J Force fields and electromagnets	9J Force fields and	9J Force fields and electromagnets	9J Force fields and

	2. Reactivity	4. Displacement	materials 6. Revision 7. Assessment	1. Force fields 2. Static electricity	electromagnets 3. Measuring electricity 4. Resistance	5. Electromagnets 6. Revision	electromagnets 7. Assessment
Spring Term 2	9C Biology revision 1. Cells and diffusion 2. Skeletal systems and nutrition 3. Organ systems and gas exchange	9C Biology revision 4. Reproduction 5. Interdependence 6. Genetics and evolution	9C Biology revision 7. Revision 8. Assessment	9G Chemistry revision 1. Separating substances 2. Atoms, elements and compounds 3. Chemical reactions	9G Chemistry revision 4. Properties of materials 5. The periodic table	9G Chemistry revision 6. Earth and atmosphere 7. Revision	9G Chemistry revision 8. Assessment
Summer Term 1	9K Physics revision 1. Particles and Matter 2. Energy resources and cost 3. Energy transfers	9K Physics revision 4. Forces 5. Waves and fields 6. Moments and electricity	9K Physics revision 7. Revision 8. Assessment	9D Biology Transition	9D Biology Transition	9D Biology Transition	9D Biology Transition

	electromagnetism B7 - Ecology						
Summer Term 1	Revision						
Summer Term 2							

How does the Five Year Curriculum Plan meet the ACE curriculum design?	
Ambitious	<p>Students are able to access the content and their appropriate level and the content allows for all students to be stretched in their development of new skills, knowledge, and application.</p> <p>Students learn through a range of activities, including practical work. All students will be stretched through the various forms of new learning and assessment.</p>
Challenging	<p>They will have a range of learning activities to stretch their knowledge. The curriculum builds on their prior knowledge and students will need to link prior learning from a range of topics.</p> <p>Assessments test knowledge, new skills, and their application in order for students to understand their weaknesses and strengths</p>
Engaging	<p>Links to the world around us, the impact that we have on the world through application are used to demonstrate why science is important. Students see a range of practical applications for the science and careers where these are useful.</p>

What are the current strengths of the Five Year Curriculum Plan?

Content is revisited throughout KS3 with topics being linked together. This has been broken down still further.

Content is revisited throughout KS4. Topics follow in a logical sequence and allow interleaving. These topics follow on from prior learning from KS3.

E.g. Organs can't be taught until cell biology has been taught. Infection and the body's response to this can't be taught until students understand cell biology and organs to appreciate how they will be affected.

Only when students understand bioenergetics can they explain regulation of the body (homeostasis and response).

A link to the applications of the science taught

A range of activities to include practical work

Using a range of skills in the lesson and therefore linking learning from other curriculum areas

Time for students to explain their understanding through open activities

What specific actions have to be taken in response to the above? Please consider:

- Unit sequence changes;
- Content changes at KS3 and KS4;
- Modifications to ensure an ACE curriculum design;
- CPD for teachers in your subject area;
- Additional research you have to consider as part of this review.

The previous curriculum within the department did not allow students to develop deeper understanding of the content. The previous curriculum covered the KS3 content in two years and didn't engage students and develop skills in the same level of depth.

Using the What, why, how and links to particular applications or careers will give students the powerful knowledge to continue to gain knowledge and skills.

Assessments have changed to assess practical skills, knowledge, and the depth of these.

We are now changing exam board as well as Entry level award for Delta. By moving to the AQA specification it is allowing us to link to a revised KS3 curriculum.

AQA exam questions regarding core practical investigations are more consistent as to the skills and techniques students will need to answer these. CLM will support the dept with her examiner knowledge to ensure we help students structure their responses for the new exam board.

Since the last version of this document we are now splitting topics to ensure concepts are revisited more frequently.

CPD in the next academic year will focus on consistency of how lessons are structured for the new teaching model. We will look at how we develop the reading skills of the students – how we assess resources to use. We will develop a departmental approach to structuring responses to mathematical work.

The department will have a rotation for masterclasses on practicals to share with each other to support inexperienced staff.