

2. CURRICULUM IMPLEMENTATION OVERVIEW PLAN

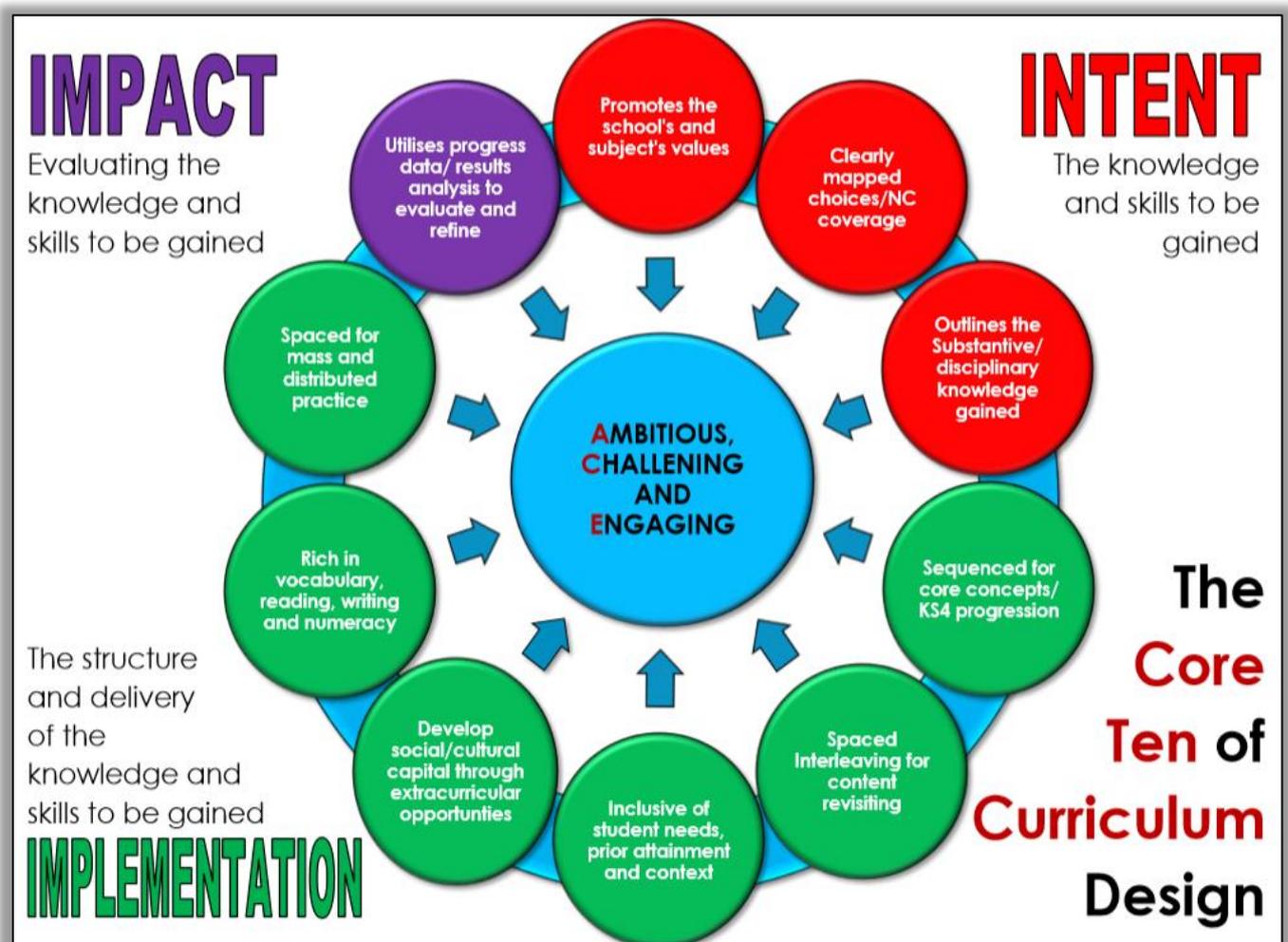
Key Stage 3

Subject: Science

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Document(s) which inform this Curriculum Implementation are:

1. Curriculum Intent Overview Plan (KS3)

THINKING PROCESS - CURRICULUM IMPLEMENTATION OVERVIEW PLAN – KS3

IMPLEMENTATION – SEQUENCING AND PRACTICE

How are your topics sequenced below so as to ensure the following:

- key concepts are ordered and taught, so as to support progression to more challenging material
- content and concepts ordered to support progression from KS2 and to KS4
- topics are spaced between unrelated topics, to allow thinking time; then revisited and furthered
- mass practice (end of topic assessments are used to evaluate the knowledge and skills gained)
- distributed practice (mini assessments) are used where content/topics are reassessed in shortened versions, at later spaced out intervals

YEAR		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
7	Unit/Topic	7A Cells, tissues, organs and systems. 7E Mixtures and Separation	7I Energy 7B Sexual Reproduction in animals	7G The particle model 7J Current and electricity	7C Muscles and Bones 7F Acids and Alkalis	7K Forces 7D Ecosystems	7H Atoms, elements and compounds 7L Sound

	<p>KS3 NC covered</p>	<p>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.</p> <p>How to separate more complicated mixtures using Distillation.</p> <p>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.</p>	<p>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! 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.</p>	<p>Looking at the structure of an atom. What makes up the matter in the universe? What are the different states of matter?</p> <p>What are the building blocks for life?</p> <p>Drawing circuit diagrams and understanding how electricity flows.</p> <p>Students design and build circuits will a selection of components, such as a bulb, motor or switch.</p>	<p>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?</p> <p>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.</p>	<p>What is a force and how can they influence objects?</p> <p>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!</p> <p>What is an Ecosystem? Variation of plants and animals and inheritance of characteristics</p> <p>Students will investigate different types of ecosystems, how organisms interact in them and how different factors can influence an ecosystem.</p>	<p>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.</p> <p>Introduction to the Periodic Table, chances are most students will not have seen one before.</p> <p>Sound waves - how is sound produced and recorded. Introduction of a longitudinal wave</p> <p>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?</p>
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Powerful Knowledge	<p>Cells – An understanding of how the body functions. How our cells function through healthy lifestyles.</p> <p>Separating substances – An understanding that mixed substances can be made pure, such as drugs and medicines.</p>	<p>Energy – To be able to discuss the different energy stores there are how they can be altered used and transferred.</p> <p>Reproduction – Demonstrating links to cells and growth. To be able to talk about how babies are made and grown inside a humans body</p>	<p>The Particle Model – An understanding of what makes up all matter and an insight into how different materials can be made.</p> <p>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.</p>	<p>Muscles and breathing – How the body produces energy. To be able to discuss how muscles allow movement.</p> <p>Acids and Alkalis – Show an understanding of the function of acids and alkalis and be able to discuss their everyday uses.</p>	<p>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.</p> <p>Ecosystems – To demonstrate an understanding that all living organisms live in habitats that are part of ecosystems.</p>	<p>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.</p> <p>Sound – To be able to talk about ow this type of energy can be produced and transferred, and how a human ear can detect sound.</p>
Mass Practice	<p>End of topic assessments for 7A Cells, tissues, organs and systems and 7E Mixtures and separation</p>	<p>End of topic assessments for 7I Energy and 7B Sexual reproduction in animals</p>	<p>End of topic assessments for 7G the particle model and 7J Current electricity</p>	<p>End of topic assessments for 7C Muscles and bones and 7F Acids and alkalis</p>	<p>End of topic assessments for 7K Forces and 7D Ecosystems</p>	<p>End of topic assessments for 7H Atoms, elements and compounds and 7L Sound</p>

<p>Distributed Practice</p>	<p>Exit ticket on organelles of plant cells (7A) and a distillation method (7E).</p> <p>Quick quiz for 7A and 7E</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. plenary quick quiz style questions on the organ system to check understanding in 7A, a starter asking pupils to write a method using many separation techniques in 7E.</p> <p>Microscopes practical – writing up method and analysing diagrams of plant cells</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 e.g. Conventions in writing lesson in 7A</p>	<p>Exit ticket on the advantages and disadvantages of renewable/non-renewable energy (7I) and the description of how an egg and sperm cell is adapted to its function (7B).</p> <p>Quick quiz for 7I and 7B</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. DNA to describe the problem with fossil fuels in 7I and a DNA asking ‘What is meant by the term ‘Organ’? in 7B.</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 e.g. writing a scientific method in 7B, summarising information in 7I</p>	<p>Exit ticket on what happens to particles going from a gas to a solid (7G) and how to draw a series circuit (7J).</p> <p>Quick quiz for 7G and 7J</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. quick check starter questions on particles in 7G and review exercise drawing circuit symbols to use in a series/parallel circuit lesson in 7J</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 e.g. hypotheses and theories in 7G</p>	<p>Exit ticket on muscles and bone movement (7C) and neutralisation between acids and alkalis (7F).</p> <p>Quick quiz for 7C and 7F</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. Plenary activity explaining how blood vessels are adapted to their function in 7C and a starter recap quiz on neutralisation in a neutralisation in the home lesson in 7F</p> <p>Neutralisation practical – writing up method and making observations relating to reactions</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 e.g. scientific questions in 7C</p>	<p>Exit ticket on force diagrams and motion (7K) and adaptations of animals (7D).</p> <p>Quick quiz for 7K and 7D</p> <p>Starters and plenaries throughout each topic that reviews previous learning E.g. DNA picture activity asking why a rope doesn’t move (recapping on forces) in 7K and a SPLAT activity on key words for environmental and inherited characteristics in 7D.</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 e.g. designing safety equipment in sport in 7K</p>	<p>Exit ticket on global warming (7H) measuring the speed of sound (7L).</p> <p>Quick quiz for 7H and 7L</p> <p>Starters and plenaries throughout each topic that reviews previous learning E.g. DNA showing 3 pictures which enables pupils to recap on elements/compounds/mixtures in 7H and Hot seat plenary questions about using sound in 7L.</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 e.g. describing the differences between fact and opinion in 7H</p>
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<p>What are the key concepts to be covered?</p>	<p>Animal and plant cells, tissues and organs present in the human body and how they form an organ system. What is a mixture and the different separation techniques, such as filtration, that can be used? The different types of energy stores and how they can be used to provide energy for appliances. How animals sexually reproduce to produce offspring, what is fertilisation and how is a baby born. The arrangement of particles in solids, liquids and gasses and the properties of them. The building of electrical circuits and how they work, what is current and voltage? The structure of the human skeleton and how muscles work. The definition of an acid and an alkali and how they react together to form a neutralisation reaction. The different types of forces and how they can affect objects. The structure of a basic ecosystem and how a plant or organism can have an impact on it. The structure of an atoms, elements and compounds and how compounds are made. How sound is formed and how a human ear hears a sound.</p>
<p>What prior knowledge, at KS2, are you assuming they have?</p>	<p style="text-align: center;">Working Scientifically</p> <p>Students can plan different types of scientific enquiries to answer questions and may be able to recognise variables. They should be able to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. They should be able to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments Living things and their habitats Students should be able to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics Animals including humans Students should be able to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans Evolution and Inheritance Students should be able to recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution Light Students should recognise that light appears to travel in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them Electricity Students should associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit They should be able to compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram</p>

	<p>What knowledge do they need to have a successful start to Year 8?</p>	<p>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.</p>					
	<p>How are topics spaced between unrelated topics?</p>	<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 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.</p>					
<p>8</p>	<p>Unit/Topic</p>	<p>8A Food and Nutrition 8E Combustion</p>	<p>8I Fluids 8B Plants and Reproduction</p>	<p>8F The Periodic Table 8J Light</p>	<p>8C Breathing and Respiration 8G Metals and their uses</p>	<p>8K Energy Transfers 8D Unicellular organisms</p>	<p>8H Rocks 8L Earth and Space</p>

<p>KS3 NC covered</p>	<p>Nutrients needed for basic nutrition and how waste food is then disposed of.</p> <p>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. Students will focus on combustion and learn how to write basic equations.</p> <p>Students will have a go at burning metals, as an example of combustion, to observe and record what happens.</p>	<p>Pressure in air and in liquids. Students will investigate the meaning of pressure, how to calculate it and how it affects everyday objects. Students will then focus on plants, how they reproduce in terms of pollination.</p> <p>Students will then also study how plants use pollination to produce offspring</p>	<p>Introduction to elements in the Earth and where to find them.</p> <p>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.</p> <p>Introduction to the study of light energy. Students will learn about refraction, reflection and how colour is seen.</p> <p>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!</p>	<p>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.</p> <p>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.</p>	<p>Students will learn about the transfer of energy, Power, Efficiency and how to calculate energy used and the energy efficiency of different appliances.</p> <p>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.</p>	<p>Introduction to Rocks and the Rock Cycle.</p> <p>Students will learn about the different categories of rocks, how they are formed and categorised. Introduction to Space, luminous objects, the solar system and space travel.</p> <p>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.</p>
<p>Powerful Knowledge</p>	<p>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.</p> <p>Combustion – Understanding how the process of combustion works and what the products will be.</p>	<p>Fluids – Knowledge of the range of uses for fluids and pressure in everyday situations.</p> <p>Plants and Reproduction- Understanding how plants reproduce using the process of pollination</p>	<p>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.</p> <p>Light – How light and other waves can be used for data communication.</p> <p>An understanding of visible light and how we see objects</p>	<p>Breathing and Respiration – How the body effectively carries out respiration and the difference between breathing and respiration.</p> <p>Metals and their uses – How metals are extracted from the Earth and what we can use metals for.</p>	<p>Energy Transfers – The range of energy transfers that can take place and how we change these energy stores.</p> <p>Unicellular organisms – To understand what unicellular organisms are and their structure and functions.</p>	<p>Rocks – To understand the formation of different types of rocks and what they can be used for.</p> <p>Space – What is out there? To understand the structure of our solar system and how space exploration works.</p>

	Mass Practice	End of topic assessments for 8A Food and Nutrition and 8E Combustion	End of topic assessments for 8I Fluids and 8B Plants and Reproduction	End of topic assessments for 8F The Periodic Table and 8J Light	End of topic assessments for 8C Breathing and Respiration and 8G Metals and their uses	End of topic assessments for 8K Energy Transfers and 8D Unicellular organisms	End of topic assessments for 8H Rocks and 8L Earth and Space
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<p>Distributed Practice</p>	<p>Exit ticket describing the nutrients in a boxer's diet (8A) and a description of an oxidation reaction (8E).</p> <p>Quick quiz for 8A and 8E</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. plenary quick quiz style questions on how enzymes are involved in digestion 8A, a DNA starter asking pupils to complete a combustion equation in 8E.</p> <p>Modelling digestion practical 8A – linking a model to the scientific theory.</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 e.g. describing what nutrients are needed in a balanced diet in 8A</p>	<p>Exit ticket discussing how different features of a cyclist and her bike help her to go fast (8I) and the description about asexual reproduction in strawberry plants (8B).</p> <p>Quick quiz for 8I and 8B</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. Recap starter activity on states of matter in the particle model in 8I and a 5 question mini quiz on plant pollination in 8B.</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 e.g. structuring paragraphs lesson in 8B and presenting information in 8I</p>	<p>Exit ticket on describing the history of the periodic table (8F) and describing why an object looks red in white light (8J).</p> <p>Quick quiz for 8F and 8J</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. consolidation plenary questions on elements, molecules and compounds in 8F and explaining how light travels using key words plenary in 8J</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 e.g. using sentences in 8F and preparing a presentation in 8J</p>	<p>Exit ticket describing breathing and respiration (8C) and corrosion (8G).</p> <p>Quick quiz for 8C and 8G</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. Recap quick quiz starter on aerobic respiration in 8C and DNA on key words describing metal properties in 8G</p> <p>Metals and acids practical 8G – writing up method and making observations relating to reactions</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 e.g. describing materials using key vocabulary in 8G</p>	<p>Exit ticket explaining how heat can be transferred (8K) and describing the 5 kingdoms (8D).</p> <p>Quick quiz for 8K and 8D</p> <p>Starters and plenaries throughout each topic that reviews previous learning E.g. a DNA efficiency calculation in 8K and a keyword recap activity on different environments in 8D.</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 e.g. explaining how heat can be transferred from one form to another when looking at a specific appliance 8K</p>	<p>Exit ticket on describing how rocks are formed (8H) and describing the structure of the solar system (8L).</p> <p>Quick quiz for 8H and 8L</p> <p>Starters and plenaries throughout each topic that reviews previous learning E.g. Plenary quiz on the three types of rocks in 8H and a DNA on listing the planets of the solar system in 8L.</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 e.g. composing scientific arguments and making comparisons in 8L and assessing sources in 8H.</p>
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<p>What are the key concepts to be covered?</p>	<p>The nutrients needed from food for the human body to function. Combustion is a chemical reaction that produces useful energy and produces carbon dioxide and water as waste products. What is pressure and how can it be used in everyday situations. The reproduction methods of plants and how pollination is used. The structure and function of the Periodic Table. The purpose of light energy and how we can see objects. Breathing is the physical process of taking in air (for oxygen) and then expelling it to remove CO₂, respiration is a chemical process. The properties of metals and why they are used for certain things. How energy can be transferred from one source to another and how this is useful. The structure of unicellular organisms and their features. The formation and structure of different rock types. The structure of Earth and our solar system.</p>
<p>What knowledge do they need to have a successful start to Year 9?</p>	<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>
<p>How are topics spaced between unrelated topics?</p>	<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>

<p>9</p>	<p>Unit/Topic</p>	<p>9A Genetics and Evolution 9E Making materials 9I Forces and Motion</p>	<p>9B Plant Growth 9F Reactivity 9J Force Fields and Electromagnets</p>	<p>B1. Cell biology</p>	<p>C1. Atomic structure and the periodic table</p>	<p>P1. Energy</p>	<p>P2. Electricity</p>	<p>P2</p>
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<p>KS3 NC covered</p>	<p>Introduction to Genetics and Evolution in animal and plants. Students will explore the structure of DNA and how it leads to genetic changes in humans and the idea of natural selection. Introduction to Materials used for the production of everyday objects. Students will learn about the use of ceramics and glass to make materials. 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.</p>	<p>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. Introduction to Reactivity in terms of chemical reactions. Students will look at reactions of metals with acids and water for example. 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.</p>	<p>4.1.1.1 Eukaryotes and prokaryotes 4.1.1.2 Animal and plant cells 4.1.1.3 Cell specialisation 4.1.1.4 Cell differentiation 4.1.1.5 Microscopy 4.1.1.6 Culturing microorganisms 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</p>	<p>5.1.1.1 Atoms, elements and compounds 5.1.1.2 Mixtures 5.1.1.3 The development of the model of the atom (common content with physics) 5.1.1.4 Relative electrical charges of subatomic particles 5.1.1.5 Size and mass of atoms 5.1.1.6 Relative atomic mass 5.1.1.7 Electronic structure 5.1.2.1 The periodic table 5.1.2.2 Development of the periodic table 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</p>	<p>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</p>	<p>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 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</p>	<p>5.2.2.3 ionic compounds 5.2.2.4 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 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</p>
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<p>Powerful Knowledge</p>	<p>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. Making Materials-To understand how materials are chosen to make certain products and how they are made. Forces and Motion- Understanding how forces are used in the movement of different kinds of objects, for example race cars and industrial cranes</p>	<p>Plant Growth-The understanding of what plants need to grow successfully and what can impede their growth. Reactivity-The understanding of how metals react with different substances and how to test for their products. Force field and Electromagnets-The understanding of how electrical of how a force field is generated and how an electromagnet can be made.</p>	<p>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?</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Mass Practice</p>	<p>End of topic assessments for 9A Genetics and Evolution and 9E Making materials 9I Forces and Motion</p>	<p>End of topic assessments for and 9B Plant Growth 9F Reactivity and 9J Force Fields and Electromagnets</p>	<p>End of topic assessments for B1- Cells</p>	<p>End of topic assessments C1- Atomic Structure and the Periodic Table</p>	<p>End of topic assessments P1- Energy</p>	<p>End of topic assessments P2- Electricity</p>

<p>Distributed Practice</p>	<p>Exit ticket explaining how variation allows evolution to occur (9A) and describing properties of materials (9E). Quick quiz for 9A , 9I and 9E</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. A starter question asking what type of variation do certain things belong to in 9A and a DNA activity using previous knowledge about materials to discuss why supermarkets now have reusable bags in 9E.</p> <p>Bird beak practical 9A – linking a model to the scientific theory.</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 e.g. writing</p>	<p>Exit ticket describing forces and motion (9I) and the description of plant growth (9B). Quick quiz for and 9B</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g consolidation plenary on plant adaptations in 9B.</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 e.g. using key vocabulary, the reactions that occur in plants (9B)</p> <p>Exit ticket describing reactivity (9F)</p> <p>Quick quiz for 9F and 9J</p> <p>Starters and plenaries throughout each topic that reviews previous learning. E.g. A set of plenary questions on word equations in 9F</p>	<p>Exit ticket on a topic - within Biology B1- Cells. Multiple choice quiz questions and exam questions to complete.</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 e.g. describing methods and techniques within project work.</p>	<p>Exit ticket on a topic - within Chemistry C1- Atomic Structure and Periodic Table. Multiple choice quiz questions and exam questions to complete.</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 e.g. describing methods and techniques within project work.</p>	<p>Exit ticket on a topic – within Physics P1- Energy. Multiple choice quiz questions and exam questions to complete.</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 e.g. describing methods and techniques within project work.</p>	<p>Exit ticket on a topic - within Physics P2- Electricity. Multiple choice quiz questions and exam questions to complete.</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 e.g. describing methods and techniques within project work.</p>
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	convincing arguments, writing for audience (9A)	and a DNA recap on describing the difference between voltage and current in 9J				
What are the key concepts to be covered?	The structure of DNA and how mutations can occur. The Evolution of organisms such as humans and how this is evident. The impact of forces on objects such as a car and how the speed of the car can then be calculated. The key components needed for successful plant growth, including levels of CO ₂ , water and sunlight available. The different levels of reactivity of metals with different reagents. The formation of a force field and how an electromagnet is made. Key revision skills and vital information for GCSE.					
What knowledge do they need to have a successful start to Year 10?	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. 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.					
How are topics spaced between unrelated topics?	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.					

IMPLEMENTATION – STUDENT NEEDS AND SUPPORT

How is student learning supported below so as to ensure the following:

- extracurricular/career opportunities which develop social and cultural capital
- key vocabulary, reading, writing and numeracy opportunities
- support for SEND and students with Low Prior Attainment, as well as challenge for students with High Prior Attainment

YEAR		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
7	Social/ Cultural Capital	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
	Tier 2/3 Vocabulary	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.	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.	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 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 words to describe how they conduct their experiment.

<p>Reading</p>	<p>Reading for research for the organelles within a cell. 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. 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. 7D – Use texts to develop summarising skills</p>	<p>7H – Teacher led reading through text to analysis how matter is made up. 7L – Students to read for analysis to construct information regarding human hearing.</p>
<p>Writing</p>	<p>Extended piece of writing in conventions in writing lesson (7A) Exit ticket description of organelles of plant cells, with opportunity to fix it after teacher feedback (7A) Exit ticket describing a distillation method with opportunity to fix it after teacher feedback (7E). 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) Writing a scientific method, which includes sub headings to break down into manageable chunks (7B) Exit ticket describing the advantages and disadvantages of renewable/non-renewable energy, with opportunity to fix it after teacher feedback (7I) Exit ticket on the description of how an egg and sperm cell is adapted to its function, with opportunity to fix it after teacher feedback (7B).</p>	<p>Extended piece of writing including hypotheses and theories in science, with examples of how to summaries a theory (7G) Exit ticket explaining what happens to particles going from a gas to a solid (7G) Exit ticket describing how to draw a series circuit, using key words (7J). Pupils write their own article about waste using adjectives, comparatives and superlatives (7G) Extended piece of writing labelled “A world without Electricity”. Pupils to use their creative writing skills (7J).</p>	<p>Extended piece of writing about how to pose scientific questions and explain them(7C) Exit ticket writing about muscles and bone movement, using key terms, with opportunity to fix it after teacher feedback (7C) Exit ticket describing neutralisation between acids and alkalis with opportunity to fix it after teacher feedback (7F). Pupils write their own article about the applications associated with neutralisation (7F)</p>	<p>Extended piece of writing designing safety equipment in sport, explaining what are the main features and reasons why. Writing frame given to support this (7K) Exit ticket writing a description about the motion of a vehicle and describing the forces that act on it. (7K) Exit ticket extended piece of writing describing the adaptations of different animals, with opportunity to fix it after teacher feedback (7D).</p>	<p>A QWC question describing the differences between fact and opinion, drawing upon different example. Structured writing frame given for support (7H) Exit ticket explaining how global warming occurs, given examples of applications that increase global warming. Example answers given to help structure writing of answer (7H) Exit ticket where pupils have to write a scientific method on how they would measure the speed of sound. Opportunity to improve writing after teacher feedback (7L).</p>

	Numeracy	Scale of a cell, hair etc	Calculate energy use. Appreciate why Joule isn't always the most appropriate unit.	Appreciation of the size of an atom (clip showing zooming in x10)	An introduction to the pH scale not being linear	Using equations for motion. Reviewing data on ecosystems – 3 averages.	Appreciation of a log scale (no mathematics). Reinforce atom size from term 3
	How does the PoS support students with SEND needs?		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.				
	How does the PoS support students with low prior attainment/challenge those with high prior attainment?		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.				
	How does the PoS offer contextual content appropriate to Amington students?		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				
8	Social/Cultural Capital	Science Club- building a model of the digestive system	Stem club- building a machine to demonstrate pressure in liquids	Science club- building periscopes and kaleidoscopes to study light	Visit to a factory to see how metal objects are made	Visit to a University/laboratory to see how they study bacteria	Visit to Cannock chase to study different rock formations Visit to National Space Centre

<p>Tier 2/3 Vocabulary</p>	<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. 8B will links back to 7A and 7B – a definitions test on these words will form part of the topic. Students will compare the animal and plant reproduction and will write a piece to describe similarities and differences using a selection of tier 2 and 3 words</p>	<p>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.</p>	<p>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</p>	<p>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</p>	<p>8H Rocks – Topic will start with a tier 3 definitions test on the words that would be covered in 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. 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>Reading</p>	<p>8A – Read for analysis to review diets/food labels. 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. 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. 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. 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. 8L Students will read for research and include their own tier 3 words. Students will peer review the research</p>

Writing	<p>Extended piece of writing about weighting and bias, with examples given to support writing (8A)</p> <p>Lesson on explaining texts, which gives the opportunity to highlight key information and writing an explanation using key words (8E)</p> <p>Exit ticket description of a boxer's diet, with opportunity to fix it after teacher feedback (8A)</p> <p>Exit ticket describing an oxidation reaction with opportunity to fix it after teacher feedback (8E).</p>	<p>Writing tasks on presenting information, with guidance given to help structure sentences using key words (8I)</p> <p>Structuring paragraphs lesson given examples of how to structure paragraphs (8B)</p> <p>Exit ticket describing features of a cyclist with opportunity to fix it after teacher feedback (8I)</p> <p>Exit ticket writing task describing asexual reproduction, with opportunity to fix it after teacher feedback (8B).</p>	<p>Using sentences lesson, which supports students to create sentences with scaffolding in place to help (8F)</p> <p>Writing task on how to preparing a presentation and create one using chunks of writing (8J)</p> <p>Exit ticket describing the history of the periodic table with opportunity to fix it after teacher feedback (8F)</p> <p>Writing task exit ticket on describing why an object looks red in white light, with opportunity to fix it after teacher feedback. Writing frame available for support. (8J).</p>	<p>Extended piece of writing describing materials using key vocabulary (8G)</p> <p>Exit ticket QWC question describing breathing and respiration, using key words. Opportunity to fix it after teacher feedback, giving support with writing (8C)</p> <p>Exit ticket describing the process of corrosion, with opportunity to fix it after teacher feedback (8G).</p> <p>Pupils write their own fitness training guide, using an example to help structure their writing (8C)</p>	<p>Exit ticket extended piece of writing explaining how heat can be transferred (8K)</p> <p>Writing exit ticket task on describing the 5 kingdoms, using key words and examples. Writing frame given to help. Opportunity to fix it after teacher feedback (8D).</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>Extended piece of writing on composing scientific arguments. Writing frames and examples given to help (8L)</p> <p>Exit ticket writing task describing how rocks are formed, with opportunity to fix it after teacher feedback. This looks at how pupils can redraft their responses (8H)</p> <p>Exit ticket writing task describing the structure of the solar system, with opportunity to fix it after teacher feedback (8L).</p> <p>Pupils write their own article about theories in geology, using writing frames to compose their explanations (8H)</p>
Numeracy	<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>
How does the PoS support students with SEND needs?		<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>				
How does the PoS support students with low prior attainment/challenge those with high prior attainment?		<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.</p>				

	How does the PoS offer contextual content appropriate to Amington students?	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.					
9	Social/Cultural Capital	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
	Tier 2/3 Vocabulary	9A Genetics and Evolution 9E Making materials. 9I Forces and Motion 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.	9B will focus more on tier 2 words to help describe the growth of a plant. 9F Reactivity 9J Force Fields and Electromagnets. Revisit tier 2 words from 8G to describe the processes in carrying out the reaction. 9J will add a tier 3 matching activity to cover 7J words and add ones relating to magnetism	Biology B1- Cells Tier 2/3 words to support students to discuss the different types of cells and how they work	Chemistry C1- Atomic Structure and the Periodic Table Tier 2/3 words to support students to discuss the different elements in the periodic table and the groups they are in	Physics P1- Energy Tier 2/3 words to support students to discuss the different stores of energy and how transfers take place	Physics P2- Electricity Tier 2/3 words to support students to discuss the way that electricity flows around a circuit and how to calculate current, resistance and voltage.
	Reading	9A – Teacher led reading, students to have tier 3 words to help understand the text. 9E – Students to choose their own text regarding ceramics/glass and list their own tier 3 words with definitions 9I – Reading mathematical problems to extract the information necessary.	9B – Skimming text to help construct a list of key nutrients of plant growth 9F – Students to explain the steps they need to take to carry out the practical after reading instructions. 9J - Reading mathematical problems to extract the information necessary.	Reading instructions to carry out investigations. Review conclusions for analysis skills Reading to summarise cells.	Reading instructions to carry out investigations. Review conclusions for analysis skills Reading to summarise the atom and the Periodic Table	Reading instructions to carry out investigations. Review conclusions for analysis skills. Reading to summarise the different energy types	Reading to summarise the atom and its pattern – teacher to support understanding of the structure. Reading to summarise the way electricity flows around a circuit

Writing	<p>Extended piece of writing convincing arguments and writing for audience. Example answers to be provided to support writing (9A)</p> <p>Exit ticket writing task describing variation, with opportunity to fix it after teacher feedback (9A)</p> <p>Exit ticket describing properties of materials using key words, with opportunity to fix it after teacher feedback (9E).</p> <p>Exam style questions that require extended answers. Example answers given to similar style questions to support pupils (9E).</p> <p>Writing task describing the forces acting on a car whilst in motion. Teacher feedback gives opportunity to improve written description (9I)</p> <p>Practicing the style of writing a scientific report. Writing frame given to support (9I)</p>	<p>Extended piece of writing explaining, using key vocabulary, the reactions that occur in plants (9B)</p> <p>Pupils write their own articles about farming problems, using an example piece of work to help structure their writing (9B)</p> <p>Practicing structuring sentences lesson, which supports students to create sentences with scaffolding in place to help (9F)</p> <p>Extended writing exercise about writing cohesive texts. Writing frame in place to support this activity (9J).</p> <p>Practical write up on displacement reactions, including method, conclusion and evaluation. Sub headings given to break writing task down into manageable chunks (9F)</p>	<p>Writing task describing methods and techniques within project work. Examples given to support pupils with writing and structuring of answers.</p> <p>Answering QWC example assessment questions on KS3 knowledge. Opportunity to fix it after teacher feedback, and comparing with peers.</p> <p>Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and writing frames available for support.</p>	<p>Writing task describing methods and techniques within project work. Examples given to support pupils with writing and structuring of answers.</p> <p>Answering QWC example assessment questions on KS3 knowledge. Opportunity to fix it after teacher feedback, and comparing with peers.</p> <p>Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and writing frames available for support.</p>	<p>Writing task describing methods and techniques within project work. Examples given to support pupils with writing and structuring of answers.</p> <p>Answering QWC example assessment questions on KS3 knowledge. Opportunity to fix it after teacher feedback, and comparing with peers.</p> <p>Answering example GCSE extended writing exam questions, using key words, example answers to similar questions, and writing frames available for support.</p>	<p>Writing task describing methods and techniques within project work. Examples given to support pupils with writing and structuring of answers.</p> <p>Answering QWC example assessment questions on KS3 knowledge. Opportunity to fix it after teacher feedback, and comparing with peers.</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	Review ratios for genetics	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

How does the PoS support students with SEND needs?	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.
How does the PoS support students with low prior attainment/challenge those with high prior attainment?	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.
How does the PoS offer contextual content appropriate to Amington students?	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.

How does the Implementation Plan meet the ACE curriculum design?

Ambitious	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. Students learn through a range of activities, including practical work. All students will be stretched through the various forms of new learning and assessment.
Challenging	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. Assessments test knowledge, new skills, and their application in order for students to understand their weaknesses and strengths.
Engaging	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.

What are the current strengths of the Implementation Plan?

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

- Core concept changes;
- Space interleaving changes;
- 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 contents 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. AQA exam questions regarding core practical investigations are more consistent as to the skills and techniques students will need to answer these. EMS will support the department 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.

Appendix: Tier 2+3 words

Example 7A

7A – Life processes

Word	Pronunciation	Meaning
excretion	<i>ex-cree-shun</i>	Getting rid of waste. All organisms excrete.
growth		Increase in size. All organisms grow.
life process		A process that something does in order for it to be alive. The life processes that happen in all living things are movement, reproduction, sensitivity, growth, respiration, excretion and a need for nutrition.
movement		Going from place to place. All organisms can move themselves or parts of themselves.
nutrition	<i>new-trish-un</i>	Substances that help organisms respire and grow. All organisms need nutrition.
organism	<i>or-gan-iz-m</i>	A living thing.
reproduction	<i>ree-pro-duck-shun</i>	A process in which organisms make more organisms like themselves. All organisms reproduce.
respiration	<i>res-per-ay-shun</i>	A process in which substances release energy for an organism to use. All organisms respire. There are, however, different forms of respiration.
sensitivity	<i>sen-se-tiv-it-ee</i>	The ability to detect things in the surroundings. All organisms can sense certain changes in their surroundings.

7A – Prescriptive writing

Word	Pronunciation	Meaning
aim		What you are trying to find out.
conclusion	<i>con-cloo-shun</i>	An explanation of how or why something happens, which is backed up by evidence. You use evidence to 'draw' a conclusion.
diagnosis	<i>dye-agg-nO-sis</i>	A conclusion made by a doctor about what is wrong with someone who is ill.
evaluation	<i>ev-val-U-ay-shun</i>	How you can improve your experiment.
method		The instructions for doing an experiment.
prediction	<i>pred-ik-shun</i>	What you think will happen and why you think this.
prescription	<i>press-krip-shun</i>	An order for some medicines that a doctor writes.
results		Measurements and observations from an experiment.