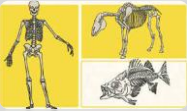




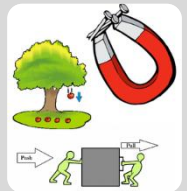
Curriculum area		Designed by	Version
Science		J. Neville	Version 5
Our curriculum is GREAT! <small>(INTENT)</small>			
Goals	<p>The goal of Science is to catch the imagination and inspire wonder and curiosity about how things work. Students at our school, irrespective of ability or learning difficulties are enthusiastic about learning about themselves and the world around them. Science should encourage questioning, independent investigation and spark ideas that can be talked about and tested. Science is about learning skills that are important in everyday life, from wiring a plug to implementing ways to save the planet from plastic pollution and global warming.</p>		
Readiness	<p>The study of Science supports students to be ready for the next stage by encouraging them to:</p> <p>Be curious - ask and answer questions to develop understanding. This is a highly transferrable personal skill.</p> <p>Debate - Ethics are explored in some topics, helping students to develop personal morality and express it to others, debating it and sometimes learning how to disagree.</p> <p>Investigate - develop and explore ideas through planned investigation; expanding skills such as prediction, using equipment properly, assessing risk, gathering and displaying data, drawing conclusions and evaluating experiments.</p> <p>Research – some topics lend themselves to independent research, which develop skills so students can differentiate between a useful and bogus source of information, which is important in today’s society.</p> <p>Be aware: learn to value our environment, show respect for our world, and learn how we should care for it for future generations, as well as our own.</p>		

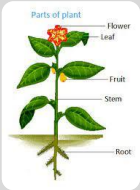
Education	<p>The Excel pathway will be encouraged to independently question, debate, investigate, research and raise awareness in all areas of the Science curriculum. Students will develop practical skills, be encouraged to see relationships in data, draw conclusions based from scientific learning and evaluate their investigations using keywords.</p> <p>The Extend pathway will have some scaffolding and support to do the same, with scientific content that is not as advanced, but as broad. This pathway aims to reinforce ideas, concepts and learning in a practical and engaging way. This pathway will cover a broad range of primary and Key Stage 3 content to see trends in data, draw simple conclusions and suggest changes to method or equipment to improve an investigation.</p> <p>The Explore pathway encourages learning through practical demonstration, group working and engaging learning. There is repetition, overlearning and consolidation, so the pace of learning is adapted to specific needs.</p> <p>Personalised learning follow a sensory curriculum exploring the physical and personal environment.</p>
Achievement	<p>Within Science, questioning is key to assessment. Teachers ask questions to formatively assess learning from previous lessons and during the lesson to check learning of new content. Students are encouraged to question the teacher, TA's and peers, to verbalise what if..., which in itself allows students to make links between different concepts, ideas and knowledge.</p> <p>Key Stage 3 study a comprehensive primary curriculum that leads into Biology GCSE(Excel pathway), Combined Science Entry Level Certificate (Extend pathway) and AQA Unit Award Scheme (Explore pathway) at Key Stage 4.</p>
Talent	<p>Students have varying interests that are nurtured through a range of activities across the school. Science Week, GREAT Friday activities, STEM Ambassador talks and seminars, whole school STEM challenges, school trips and conversations about Science on the gate and playground; all contribute to the personal development of our students in the areas of Science.</p>

Education Pathways- Key Stage 3 & 4

	Education Goals <i>Explore Pathway</i>	Education Goals <i>Extend Pathway</i>	Education Goals <i>Excel Pathway</i>
Year 7			
Autumn 1 	<u>Animals including humans</u> <ul style="list-style-type: none"> Identify and name a variety of common animals, including fish, amphibians, reptiles birds and mammals Identify and name common carnivores, herbivores and omnivores Describe and compare the structure of common animals Identify, name, draw and label the basic parts of the human body and link them to senses 	<u>Animals Including Humans</u> <ul style="list-style-type: none"> Identify and name a variety of common animals, including fish, amphibians, reptiles birds and mammals Identify and name common carnivores, herbivores and omnivores Describe and compare the structure of common animals Identify, name, draw and label the basic parts of the human body and link them to senses 	<u>Animals Including Humans</u> <ul style="list-style-type: none"> Identify and name a variety of common animals, including fish, amphibians, reptiles birds and mammals Identify and name common carnivores, herbivores and omnivores Describe and compare the structure of common animals Identify, name, draw and label the basic parts of the human body and link them to senses

		<ul style="list-style-type: none"> ▪ Notice that animals have offspring which grown into adults ▪ Find out and describe the basic needs of animals for survival (food, water, air) ▪ Describe the importance of exercise and health eating for humans and the role of hygiene 	<ul style="list-style-type: none"> ▪ Notice that animals have offspring which grown into adults ▪ Describe the changes as humans develop to old age ▪ Find out and describe the basic needs of animals for survival (food, water, air) ▪ Describe the importance of exercise and health eating for humans and the role of hygiene ▪ Identify that animals need the right types of amount of nutrition and that they cannot make their own food so must eat ▪ Identify that some animals have skeletons and muscles for support, protection and movement
<p>Autumn 2</p> 	<p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Ask simple questions and recognise they can be answered in different ways ▪ Observe closely, using simple equipment ▪ Perform simple tests ▪ Identify and classify ▪ Use observations and ideas to suggest answers to questions ▪ Gather and record data to help answer questions 	<p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Ask simple questions and recognise they can be answered in different ways ▪ Observe closely, using simple equipment ▪ Perform simple tests ▪ Identify and classify ▪ Use observations and ideas to suggest answers to questions ▪ Gather and record data to help answer questions ▪ Record findings using language, drawing, labelled diagrams, keys, bar charts and tables ▪ Report on findings from enquiries (written and spoken) and display results and conclusions 	<p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Use a range of scientific enquiry ▪ Set up practical enquiries, comparative and fair tests ▪ Make systematic and careful observations, taking accurate measurements using units and equipment. ▪ Gather, record, classify and present data in a variety of ways ▪ Record findings using language, drawing, labelled diagrams, keys, bar charts and tables ▪ Report on findings from enquiries (written and spoken) and display results and conclusions ▪ Use results to draw conclusions, make predictions, suggest improvements and ask further questions ▪ Identify differences, similarities or changes related to ideas and processes ▪ Use scientific evidence to answer questions or support findings

<p>Spring 1</p> 	<p><u>Everyday Materials</u></p> <ul style="list-style-type: none"> ▪ Distinguish between an object and the material from which it is made ▪ Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock ▪ Describe the simple physical properties of a variety of everyday materials ▪ Compare and group materials on the basis of physical properties ▪ Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<p><u>Everyday Materials</u></p> <ul style="list-style-type: none"> ▪ Distinguish between an object and the material from which it is made ▪ Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock ▪ Describe the simple physical properties of a variety of everyday materials ▪ Compare and group materials on the basis of physical properties ▪ Identify and compare the suitability of materials for particular uses ▪ Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<p><u>Everyday Materials</u></p> <ul style="list-style-type: none"> ▪ Distinguish between an object and the material from which it is made ▪ Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock ▪ Describe the simple physical properties of a variety of everyday materials ▪ Compare and group materials on the basis of physical properties ▪ Identify and compare the suitability of materials for particular uses ▪ Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
<p>Spring 2</p> 	<p><u>Forces and Magnets</u></p> <ul style="list-style-type: none"> ▪ Observe how magnets attract or repel each other and attract some, but not all, materials ▪ Describe magnets as having two poles ▪ Predict whether magnets will attract or repel each other 	<p><u>Forces and Magnets</u></p> <ul style="list-style-type: none"> ▪ Observe how magnets attract or repel each other and attract some, but not all, materials ▪ Compare and group a variety of materials on magnetic basis and identify magnetic materials ▪ Describe magnets as having two poles ▪ Predict whether magnets will attract or repel each other 	<p><u>Forces and Magnets</u></p> <ul style="list-style-type: none"> ▪ Observe how magnets attract or repel each other and attract some, but not all, materials ▪ Compare and group a variety of materials on magnetic basis and identify magnetic materials ▪ Describe magnets as having two poles ▪ Predict whether magnets will attract or repel each other
<p>Summer 1</p> 	<p><u>Seasonal Changes</u></p> <ul style="list-style-type: none"> ▪ Observe changes across the four seasons ▪ Observe and describe weather associated with seasons ▪ Observe how length of the day varies <p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Ask simple questions and recognise they can be answered in different ways ▪ Observe closely, using simple equipment ▪ Perform simple tests 	<p><u>Seasonal Changes</u></p> <ul style="list-style-type: none"> ▪ Observe changes across the four seasons ▪ Observe and describe weather associated with seasons ▪ Observe how length of the day varies <p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Ask simple questions and recognise they can be answered in different ways ▪ Observe closely, using simple equipment ▪ Perform simple tests 	<p><u>Seasonal Changes</u></p> <ul style="list-style-type: none"> ▪ Observe changes across the four seasons ▪ Observe and describe weather associated with seasons ▪ Observe how length of the day varies <p><u>Scientific Working</u></p> <ul style="list-style-type: none"> ▪ Use a range of scientific enquiry ▪ Set up practical enquiries, comparative and fair tests

	<ul style="list-style-type: none"> Identify and classify Use observations and ideas to suggest answers to questions Gather and record data to help answer questions 	<ul style="list-style-type: none"> Identify and classify Use observations and ideas to suggest answers to questions Gather and record data to help answer questions Record findings using language, drawing, labelled diagrams, keys, bar charts and tables Report on findings from enquiries (written and spoken) and display results and conclusions 	<ul style="list-style-type: none"> Make systematic and careful observations, taking accurate measurements using units and equipment Gather, record, classify and present data in a variety of ways Record findings using language, drawing, labelled diagrams, keys, bar charts and tables Report on findings from enquiries (written and spoken) and display results and conclusions Use results to draw conclusions, make predictions, suggest improvements and ask further questions Identify differences, similarities or changes related to ideas and processes Use scientific evidence to answer questions or support findings
<p>Summer 2</p> 	<p><u>Plants</u></p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees Find out and describe how plants need water, light and heat to grow and stay healthy Identify and describe the functions of different parts of plants 	<p><u>Plants</u></p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and heat to grow and stay healthy Identify and describe the functions of different parts of plants 	<p><u>Plants</u></p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and heat to grow and stay healthy Identify and describe the functions of different parts of plants Explore the requirements of plants for life and growth and how this varies from plant to plant Investigate the way water is transported in plants Explore the part of flowers in the life cycle of flowering plants, including pollination, seed formation and dispersal

	Education Goals <i>Explore Pathway</i>	Education Goals <i>Extend Pathway</i>	Education Goals <i>Excel Pathway</i>
Year 8			
Autumn 1	Living Things and Their Habitats Explore and compare the differences between things that are living, dead and have never been alive Identify that most living things live in habitats to which they are suited and describe how habitats cater for the needs of animals and how they depend on each other Identify and name a variety of plants and animals in their habitats/microhabitats Describe how animals obtain food from plants and other animals, simple food chains and identify and name sources of food Describe the life process of reproduction in some plants and animals	Living Things and Their Habitats Explore and compare the differences between things that are living, dead and have never been alive Identify that most living things live in habitats to which they are suited and describe how habitats cater for the needs of animals and how they depend on each other Identify and name a variety of plants and animals in their habitats/microhabitats Describe how animals obtain food from plants and other animals, simple food chains and identify and name sources of food Describe the life process of reproduction in some plants and animals	Living Things and Their Habitats Explore and compare the differences between things that are living, dead and have never been alive Identify that most living things live in habitats to which they are suited and describe how habitats cater for the needs of animals and how they depend on each other Identify and name a variety of plants and animals in their habitats/microhabitats Describe how animals obtain food from plants and other animals, simple food chains and identify and name sources of food Describe the differences of life cycles in mammals, amphibians, insects and birds Describe the life process of reproduction in some plants and animals

Autumn 2	Forces and Magnets Notice some forces need contact between two objects, but magnetic forces can act at a distance Compare how things move on different surfaces Compare and group a variety of materials on magnetic basis and identify magnetic materials	Forces and Magnets Notice some forces need contact between two objects, but magnetic forces can act at a distance Compare how things move on different surfaces Compare and group a variety of materials on magnetic basis and identify magnetic materials	Forces and Magnets Notice some forces need contact between two objects, but magnetic forces can act at a distance Compare how things move on different surfaces Compare and group a variety of materials on magnetic basis and identify magnetic materials
Spring 1	Everyday Materials Identify and compare the suitability of materials for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	States of Matter Compare and group materials together, according to whether they are solid, liquid or gas Observe some materials change state when heated or cooled and measure or research the temperature where this happens Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	States of Matter Compare and group materials together, according to whether they are solid, liquid or gas Observe some materials change state when heated or cooled and measure or research the temperature where this happens Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
Spring 2	Rocks and Fossils Compare and group different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter	Rocks and Fossils Compare and group different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter	Rocks and Fossils Compare and group different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter
Summer 1	Living Things and Their Habitats Recognise living things can be grouped in a variety of ways	Living Things and Their Habitats Recognise living things can be grouped in a variety of ways	Living Things and Their Habitats Recognise living things can be grouped in a variety of ways

	<p>Describe the life process of reproduction in some plants and animals</p> <p>Describe the differences of life cycles in mammals, amphibians, insects and birds</p>	<p>Explore and use classification keys to group, identify and name a variety of living things in local and wider environment</p> <p>Recognise that environments change and this can pose dangers to living things</p> <p>Describe the differences of life cycles in mammals, amphibians, insects and birds</p> <p>Describe the life process of reproduction in some plants and animals</p>	<p>Explore and use classification keys to group, identify and name a variety of living things in local and wider environment</p> <p>Recognise that environments change and this can pose dangers to living things</p> <p>Describe the differences of life cycles in mammals, amphibians, insects and birds</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Describe the classification of living things according to observable characteristics and based on similarities and differences</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>
<p>Summer</p> <p>2</p>	<p>Animals Including Humans</p> <p>Notice that animals have offspring which grown into adults</p> <p>Find out and describe the basic needs of animals for survival (food, water, air)</p> <p>Describe the importance of exercise and healthy eating for humans and the role of hygiene</p>	<p>Animals Including Humans</p> <p>Identify that animals need the right types of amount of nutrition and that they cannot make their own food so must eat</p> <p>Identify that some animals have skeletons and muscles for support, protection and movement</p> <p>Describe the simple functions of basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their basic functions</p>	<p>Animals Including Humans</p> <p>Describe the simple functions of basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their basic functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p> <p>Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p>

	Education Goals <i>Explore Pathway</i>	Education Goals <i>Extend Pathway</i>	Education Goals <i>Excel Pathway</i>
Year 9			
Autumn 1	Properties and Changes of Materials Compare and group materials on basis of properties, including hardness, solubility, transparency, conductivity and response to magnets Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution Give reasons for the uses of everyday materials Demonstrate that dissolving, mixing and changes of state and reversible	Properties and Changes of Materials Compare and group materials on basis of properties, including hardness, solubility, transparency, conductivity and response to magnets Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated Give reasons for the uses of everyday materials Demonstrate that dissolving, mixing and changes of state and reversible Explain some changes result in the formation of new materials and that this is not usually reversible, including changes associated with burning and action of acid on bicarb of soda	Properties and Changes of Materials Compare and group materials on basis of properties, including hardness, solubility, transparency, conductivity and response to magnets Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated Give reasons for the uses of everyday materials Demonstrate that dissolving, mixing and changes of state and reversible Explain some changes result in the formation of new materials and that this is not usually reversible, including changes associated with burning and action of acid on bicarb of soda

Autumn 2	Earth and Space Describe the movement of the earth and other planets relative to the sun Describe the movement of the moon relative to the earth Describe the sun, earth and moon as approximately spherical bodies Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky	Earth and Space Describe the movement of the earth and other planets relative to the sun Describe the movement of the moon relative to the earth Describe the sun, earth and moon as approximately spherical bodies Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky	Earth and Space Describe the movement of the earth and other planets relative to the sun Describe the movement of the moon relative to the earth Describe the sun, earth and moon as approximately spherical bodies Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky
Spring 1	Light Recognise you need light to see things and dark is the absence of light Notice that light is reflected from surfaces Recognise light from the sun can be dangerous and there are ways to protect their eyes Recognise shadows are formed when light is blocked Find patterns in the way that size of shadows change	Light and Sound Identify how sounds are made, associating some of them with vibration Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the volume of a sound and the strength of the vibration that produced it Recognise that sounds get fainter as distance from the source increases Recognise you need light to see things and dark is the absence of light Notice that light is reflected from surfaces Recognise light from the sun can be dangerous and there are ways to protect their eyes Recognise shadows are formed when light is blocked Recognise that light appears to travel in straight lines Use this idea 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, to our eyes	Light and Sound Identify how sounds are made, associating some of them with vibration Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibration that produced it Recognise that sounds get fainter as distance from the source increases Recognise you need light to see things and dark is the absence of light Notice that light is reflected from surfaces Recognise light from the sun can be dangerous and there are ways to protect their eyes Recognise shadows are formed when light is blocked Find patterns in the way that size of shadows change Recognise that light appears to travel in straight lines Use this idea to explain that objects are seen because they give out or reflect light into the eye

		Use the idea that light travels in straight lines to explain why shadows have the same shape as objects that cast them	Explain that we see things because light travels from light sources to our eyes or from light sources, to objects, to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as objects that cast them
Spring 2	Forces Explain that unsupported objects fall towards the Earth because of gravity Identify the effects of air resistance, water resistance and friction that act between moving surfaces	Forces Explain that unsupported objects fall towards the Earth because of gravity Identify the effects of air resistance, water resistance and friction that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have greater effect	Forces Explain that unsupported objects fall towards the Earth because of gravity Identify the effects of air resistance, water resistance and friction that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have greater effect
Summer 1	Animals Including Humans Identify that animals need the right types of amount of nutrition and that they cannot make their own food so must eat Identify that some animals have skeletons and muscles for support, protection and movement	Animals Including Humans Describe the changes as humans develop to old age 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 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 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
Summer 2	Plants Identify and describe the functions of different parts of plants	Plants Explore the requirements of plants for life and growth and how this varies from plant to plant Investigate the way water is transported in plants	Plants Explore the requirements of plants for life and growth and how this varies from plant to plant Investigate the way water is transported in plants

	<p>Explore the requirements of plants for life and growth and how this varies from plant to plant</p> <p>Investigate the way water is transported in plants</p> <p>Explore the part of flowers in the life cycle of flowering plants, including pollination, seed formation and dispersal</p>	<p>Explore the part of flowers in the life cycle of flowering plants, including pollination, seed formation and dispersal</p>	<p>Explore the part of flowers in the life cycle of flowering plants, including pollination, seed formation and dispersal</p> <p>Investigate the role of plant organs in photosynthesis</p> <p>Investigate the influence of light intensity on the growth of plants.</p>
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	Education Goals <i>Explore Pathway</i>	Education Goals <i>Extend Pathway</i>	Education Goals <i>Excel Pathway</i>
Year 10			
Autumn 1	States of Matter <p>Compare and group materials together, according to whether they are solid, liquid or gas</p> <p>Observe some materials change state when heated or cooled and measure or research the temperature where this happens</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	ELC Chemistry Unit 3: Elements, Mixtures and Compounds <p>Recall that all substances are made of atoms and describe the distribution of elements in the periodic table in relation to groups, metals and non-metals.</p> <p>Describe and investigate how compounds are made. Recognise simple compounds from their names and write word equations.</p> <p>Describe and investigate the structure of mixtures and how to separate them.</p> <p>Recall the three states of matter and describe physical changes between states.</p>	Fundamental Chemistry Unit and Scientific Working <p>Describe the structure of an atom and how its position on the periodic table shows the number of neutron, protons and electrons.</p> <p>Become familiar with the Periodic Table and explain the layout, identifying the position of metals and non-metals. Name the first 20 elements and some other important elements and use them in word or symbol equations. Specifically study Groups 1, 7 and 0 and explain reactivity.</p> <p>Use the pH scale to identify acids, alkalis and neutral substances. Investigate acids, alkalis, acids reactions with metals and neutralisation. Explain these reactions and their uses.</p>

		Describe the structure, properties and uses of two forms of carbon	Describe the carbon cycle. Explain the importance of the carbon cycle and the role micro-organisms play. Research climate change, contributing factors and how humans can mitigate
Autumn 2	Electricity Identify common appliances that run on electricity Construct a simple series circuit, identifying and naming its basic parts Identify whether a lamp will light based on complete circuit knowledge Recognise the role of switches in opening/closing circuits and associate this with whether a lamp will light Recognise common conductors and insulators, and associate metals with being good conductors	Describe and investigate the properties, structure, sources, methods of extraction, uses and reactivity of metals. Discuss the impact of humans on the environment, using metal and polymers as specific examples, and the importance of recycling.	Fundamental Physics Unit and Scientific Working Investigate and explain states of matter in terms of the particle model and density. Investigate (any or all) heat capacity, speed, stopping distance, weight vs. mass, forces and extension. Describe how the National Grid transfers electricity from source to outlet. Identify the components of a plug, state their functions and correctly assemble it. Identify renewable and non-renewable resources, and compare the ways in which energy resources are used.
Spring 1	Sound Identify how sounds are made, associating some of them with vibration Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibration that produced it	ELC Physics Unit 5: Energy, Forces and the Structure of Matter Identify energy stores, how energy transfers, efficiency of the change and how energy is wasted in a range of appliances. Identify energy resources as renewable or non-renewable, and describe the implications of each.	GCSE Biology Unit 1 -Cells Identify, draw and describe the function of different kinds of cells, including adaptation features. Use a microscope to observe cells and prepare slides of plant and animals cells. Investigate diffusion, and explain what factors influence the rate. Describe where diffusion occurs in plants and animals, linking the diffusion of oxygen to respiration. Investigate and explain osmosis, as well as the where it happens in plants and animals

	Recognise that sounds get fainter as distance from the source increases	Describe and investigate a force, work and friction.	
Spring 2	Scientific Working Record findings using language, drawing, labelled diagrams, keys, bar charts and tables Report on findings from enquiries (written and spoken) and display results and conclusions Use results to draw conclusions, make predictions, suggest improvements and ask further questions Identify differences, similarities or changes related to ideas and processes Use scientific evidence to answer questions or support findings	Investigate speed, use correct units and calculate speed using an equation. Recall what stopping distance is Describe and investigate the factors, both human and environmental, that affect stopping distance. Describe the different kinds of radiation, their uses and dangers.	GCSE Biology Unit 2 – Infection and response Describe and explain how 4 different pathogens cause infection and make us feel ill, and how human immune defences work to prevent them. Explain how vaccination prevents disease and antibiotics treat bacterial infection. Explain how drugs are developed and tested to be safe and effective.
Summer 1	Living Things and Their Habitats Recognise living things can be grouped in a variety of ways Explore and use classification keys to group, identify and name a variety of living things in local and wider environment Recognise that environments change and this can pose dangers to living things	ELC Biology Unit 1: The Human Body Recall and describe how the body is organised into cells, tissues, organs and system, and their roles in the human body; particularly the digestive and cardiovascular systems. Understand the role of diet and exercise on our health, and the links of poor lifestyle choices to disease.	GCSE Biology Unit 3 – Organisation Describe and explain how the body is organised into cells, tissues, organs and system, and their roles in the human body. Describe and explain the structure and function of the cardiovascular system, with emphasis on causes and treatments of heart and lung disease. Describe and explain the process of digestion, concentrating on the role of enzymes.

<p>Summer 2</p>	<p>Animals Including Humans</p> <p>Describe the simple functions of basic parts of the digestive system in humans Identify the different types of teeth in humans and their basic functions Construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>Describe how pathogens cause infection and make us feel ill, and how human immune defences work to prevent them. Recall how vaccination prevents disease and antibiotics treat bacterial infection, and how certain drugs affect the body. Describe how drugs are developed and tested to be safe and effective.</p> <p>Recall and describe the effects of the nervous and endocrine systems, including reflexes, puberty, the menstrual cycle and contraception.</p>	<p>GCSE Biology Unit 4 – Plants Mock Examinations</p> <p>Describe and explain the structure and function of a plant, what a plant needs to survive and how plants defend themselves against damage and disease. Investigate how plants grow and the role of hormones.</p> <p>Investigate photosynthesis, how a plant carries it out and what it does with the products.</p>
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	Education Goals <i>Explore Pathway</i>	Education Goals <i>Extend Pathway</i>	Education Goals <i>Excel Pathway</i>
Year 11			
Autumn 1	Earth and Space <ul style="list-style-type: none"> Describe the movement of the earth and other planets relative to the sun Describe the movement of the moon relative to the earth Describe the sun, earth and moon as approximately spherical bodies Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky 	Environment, Evolution and Inheritance <p>Understand and construct food chains to show the flow of energy from the sun through to top predators.</p> <p>Describe adaptation and competition in plants and animals, and how environments can be affected by living and non-living factors. Investigate photosynthesis, and the role producers play in an ecosystem.</p> <p>Describe decay and the role micro-organisms have in the carbon cycle.</p> <p>Describe the causes and effects of pollution on our environment</p>	Homeostasis and response <p>Describe and explain the structure and functions of the nervous system (including the eye), the importance of reflexes, and how nervous control contributes to homeostasis.</p> <p>Describe and explain the components of the endocrine system, the importance of hormones and what hormones do in the process of puberty, menstruation and fertility.</p> <p>Describe and explain the process of homeostasis, why it is important and the effects on the body when it goes wrong, particularly concentrating on diabetes. Explain and describe the role of the kidney in the excretory system,</p>
Autumn 2	Animals Including Humans <p>Describe the changes as humans develop to old age</p> <p>Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise and lifestyle on the way their bodies function</p>	<p>Describe the theory of evolution, how fossils are used and proof and the factors that are involved in evolution, including natural selection and competition.</p> <p>Describe sexual and asexual reproduction in plants and animals, including the role of artificial selection, genetic engineering and cloning, and that these processes involve DNA and chromosomes.</p>	GCSE Biology Unit 6 – Inheritance, variation and evolution <p>Describe and explain the theory of evolution, how fossils are used as proof and the factors that are involved in evolution, including natural selection and competition and extinction.</p>

	Describe the ways in which nutrients and water are transported within animals, including humans		Describe and explain sexual and asexual reproduction in plants and animals, including the role of artificial selection, genetic engineering and cloning, and discuss the ethics of these processes. Go into detail about the structure of DNA, how inheritance is due to genetic and environmental factors, and how mutations can lead to genetic diseases such as CF and Polydactyly.
Spring 1	Forces Explain that unsupported objects fall towards the Earth because of gravity Identify the effects of air resistance, water resistance and friction that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have greater effect	ELC Chemistry Unit 4: Chemistry in Our World Investigate the reactions of acids, their products and how to test for hydrogen, carbon dioxide and oxygen. Recall examples of an acid, alkali and neutral solutions and investigate the neutralisation reaction Investigate chemical reactions including: crystallisation, temperature changes, rate of reaction and catalysts. Describe how our atmosphere was formed, how it has changed and the effects of man on the environment through the use of fossil fuels. Investigate combustion and its products, effects on the environment and research ways to minimise the damage. Recall that safe drinking water has few dissolved substances and low levels of microbes. Describe how safe drinking water is produced by filtration and sterilisation.	GCSE Biology Unit 7 – Ecology and Mock Examination Describe habitats and ecosystems and factors that affect survival such as competition, adaptation and interdependence. Construct a food chain and explain the roles of producer and consumers, predator and prey, and display data in pyramids of numbers and biomass. Carry out field investigations to sample organisms, describe what animals and plants need to survive and the importance of biodiversity. Discuss the impact of humans on the environment, including acid rain, deforestation, eutrophication, global warming and mass farming.

<p>Spring 2</p>	<p>Properties and Changes of Materials</p> <p>Compare and group materials on basis of properties, including hardness, solubility, transparency, conductivity and response to magnets</p> <p>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated</p> <p>Give reasons for the uses of everyday materials</p> <p>Demonstrate that dissolving, mixing and changes of state and reversible</p> <p>Explain some changes result in the formation of new materials and that this is not usually reversible, including changes associated with burning and action of acid on bicarb of soda</p>	<p>ELC Physics Unit 6: Electricity, Magnetism and Waves</p> <p>Construct a series and parallel circuit, measure voltage and amps and recall the symbols for electrical components. Recall what current (both AC and DC), voltage and resistance is and describe how a electricity works from both a mains and battery source.</p> <p>Study power in an appliance, how to safely wire a plug and how appliances transfer energy.</p> <p>Link electricity with magnetism by studying electromagnets, their uses and how they can be strengthened. Recall and investigate the properties of permanent magnets.</p>	<p>GCSE Biology Required Practicals - Consolidation</p> <p>Repeat and/or watch demonstrations of the required biology practicals.</p> <p>Revise and extend knowledge of write-up techniques, from prediction to evaluation.</p> <p>Revise definitions and reinforce how to answer questions on variables.</p>
<p>Summer 1</p>	<p>Evolution and Inheritance</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	<p>Recognise the properties of waves, using sound as a longitudinal wave and light as a transverse wave example. Use keywords to describe these properties and use the wave equation with units.</p> <p>Study the electromagnetic spectrum, with its uses and dangers, and identify the risks associated with each wavelength.</p> <p>Coursework Deadline 15 May.</p>	<p>GCSE Examinations Preparation</p> <p>Identify and complete mastery of topics identified in the mock examinations as areas for concern using online, interactive and individual revision techniques.</p> <p>Revise GCSE Paper 1 topics – Cells, Infection and Response, Organisation and Plants.</p> <p>Class based revision and mastery –</p> <ul style="list-style-type: none"> • interactive quizzes • exam paper practice concentrating on how to interpret questions and answer accordingly -

			<p>list, label, describe, explain, analyse, discuss, evaluate.</p> <ul style="list-style-type: none"> • Reinforce maths in science techniques – calculating a mean, plotting a graph, interpreting data in a table or graph. • Introducing different individual revision techniques – revision cards, knowledge trees, posters, online learning (Seneca) and appropriate YouTube channels for re-watching practicals.
<p>Summer 2</p>	<p>Living Things and Their Habitats</p> <p>Describe the differences of life cycles in mammals, amphibians, insects and birds Describe the life process of reproduction in some plants and animals Describe the classification of living things according to observable characteristics and based on similarities and differences Give reasons for classifying plants and animals based on specific characteristics</p>	<p>Project</p> <p>Complete teaching as necessary. Students can leave on June 30. Students that remain will complete practicals for enjoyment or undertake a short STEM project.</p>	<p>Examinations conclude. Project</p> <p>Revise GCSE Paper 2 topics – Homeostasis, Ecology and Inheritance.</p> <p>Class based revision and mastery –</p> <ul style="list-style-type: none"> • interactive quizzes • exam paper practice concentrating on how to interpret questions and answer accordingly - list, label, describe, explain, analyse, discuss, evaluate. • Reinforce maths in science techniques – calculating a mean, plotting a graph, interpreting data in a table or graph. • Introducing different individual revision techniques – revision cards, knowledge trees, posters, online learning (Seneca) and appropriate YouTube channels for re-watching practicals. <p>Students can leave on June 30. Students that remain will complete practicals for enjoyment or undertake a short STEM project.</p>