

C - Courage

A - Achievement

Y – Your Actions

T - Tolerance

O – Our World

N - Nurturing



Cayton School Science Progression Map

Learn from yesterday, seek today and aim for tomorrow

Intent								
Cayton School Vision	“To deliver the highest standards enabling all children and adults to grow, learn and work together where laughter, respect, trust and harmony are highly valued”							
Cayton School principles	Broad and Balanced, each subject has sufficient time to contribute effectively to learning	Sequential and Progressive	Engaging and Interesting	Ambitious and Progressive	Every child awarded the same offer	Prior Learning and Knowledge on Knowledge opportunities	Making Life-long Learners	Reading a priority – whole school reading culture
Why Cayton School Curriculum is unique	We have written our curriculum with a strong emphasis towards Local: Community, History, Geography, Culture and Faith	Our Curriculum has a rich knowledge base and strong skills development	A strong emphasis on vocabulary allows children to learn and apply words in a variety of contexts	Cultural Capital opportunities support children to accomplish the very best they can be	PSHE is a thread that runs throughout our Curriculum	We have written the Curriculum to support children to develop lively, enquiring and creative minds	We understand the importance of a healthy body, healthy mind which is prioritised throughout our Curriculum	
Intent	Our overriding belief at Cayton School is that our role as Educators is to ensure children are prepared for the future and have the skills to be life long, curious learners. We passionately believe that life skills as well as academic success is vitally important. Our curriculum is designed to ensure life-long learners who are kind, confident and successful. Our designing of our bespoke curriculum was underpinned by evidence and research in order to challenge thinking and encourage enquiry.							
Cayton Awards Culture	C - Courage	A - Achievement	Y – Your Actions	T - Tolerance	O – Our World	N - Nurturing		
Implementation								
Delivering the Curriculum	Centrist pedagogical approach	A strong emphasis on positive behaviour through Cayton Awards	A whole school approach to PSHE	Opportunities for collaborative and shared work	The importance of Reading is implemented throughout our Curriculum offer	Every class has a Cayton, Cultural, Capital, Citizenship and community Passport throughout school		
Evidence Based Research	Metacognition ‘learning to learn’ using scaffolding strategies EEF evidence		Language skills at the centre of Quality First Teaching Rose Report/ EEF	English Curriculum delivery has a strong emphasis on vocabulary and reading Reading spine Doug Lemov		The power of ‘empowerment’ Dr Raj Persaud/ Hertzog Performance=Skills x Motivation		
Pedagogy	Enquiry based learning – Enquiry based driver questions	Teacher centred		Holistic approach	Togetherness		Well-being	
Processes and Procedures	A strong focus on assessment for learning throughout school	Training and empowerment of subject leaders to lead their subjects		Clear guidance and structure in teaching core subjects	Robust assessment of core and foundation subjects throughout school	Clear rules and routines set out to support all children		
Implementation	Professional Development and Empowerment of staff supports pedagogical theories and research and equips all teachers to confidently deliver and implement the Curriculum. We implement clear structures and teaching sequences, which underpin the teaching of Reading, Writing and Mathematics. The whole curriculum is taught through ‘Metacognitive’ pedagogy which encourages children to ‘learn to learn’ and self-regulate, thus enabling them to question their learning.							
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Impact								
What ‘success’ looks like at Cayton School	Children develop self-confidence and self-esteem	High Quality Outcomes for all children based on their starting points		Strong feeling of Community	A rich and diverse school culture	Children prepared for life-long learning		
Ambition	Children and adults are proud of themselves and proud to be part of the Cayton Community	Progress and attainment at each Key Stage shows outcomes as being above the ‘National Average’		Children and adults are kind, courteous and confident	Adults are a positive role model in all that they do and say	Children are self-regulated in their learning and take responsibility for their actions		
Evidence	Outcomes at each stage of learning	Pupil and staff voice		Impact of school development priorities	Stakeholder feedback	Formal and Informal assessments		A positive Cayton Awards Culture throughout school
Cayton Awards Culture	C - Courage	A - Achievement	Y – Your Actions	T - Tolerance	O – Our World	N - Nurturing		

Developing Scientists at Cayton School

A Scientist at Cayton School will have...

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.



Ambition

At Cayton School, it is our intention to enable children to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. Within this process of learning, we want our pupils to experience the joy of scientific discovery, provoking a long-lasting interest and passion for scientific learning. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. At Cayton School our children will be able to critically examine scientific evidence from their own and others' experiments, and draw justifiable conclusions based on this analysis. Through this process, we know that our pupils will be active learners and, in line with our whole school curriculum, develop excellent spoken language skills and vocabulary that will support them throughout their academic studies and in later life.

SEND

At Cayton School science lessons are meticulously considered to enable the learning for children with SEND. Our curriculum plans aim to pre-teach, providing some learners with the opportunity to learn new vocabulary and concepts in advance of a lesson in a small group setting. Misconceptions are minimalised by ensuring content is taught in a logical and progressive order across the school's curriculum and at the beginning of new learning misconceptions relevant to the subject area are pre-empted and addressed. Children are exposed to the equipment and nature of the learning (especially for experiments and practical activities) to spark engagement and interest in the upcoming lesson. Cayton school science lessons are often very practical, collaborative, busy and fun so to consider learners with sensory impairments and physical disabilities teachers maintain a calm learning environment by ensuring clear routines and organised workspaces are used. Teachers at Cayton School carefully plan, and always test practical experiments before the lesson. They give clear step-by-step instructions, whether this be using visuals cues and/or more precise steps for learners needing additional guidance. Teaching assistants are planned for to encourage the learner to participate and maintain focus. Children are provided with topical word banks and picture cards that the learner can point or refer to when explaining scientific processes. We make sure learners understand the purpose of each step and that they can link scientific content to what they are doing. Abstract concepts are brought to life through concrete resources, roleplay, real life experiences and links to other areas of the curriculum to ensure that children are able to apply their scientific knowledge fully.

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Strands	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Working scientifically skills							
Asking questions		Ask simple questions and recognise that they can be answered in different ways	Ask simple questions and recognise that they can be answered in different ways	Ask relevant questions and use different types of scientific enquiries to answer them.	Ask relevant questions and use different types of scientific enquiries to answer them.	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Observing closely		Observe closely, using simple equipment	Observe closely, using simple equipment	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Identifying and classifying		Identify and classify	Identify and classify	Gather, record, classify and present data in a variety of ways to			

				help in answering questions			
Answering questions		Use their observations and ideas to suggest answers to questions	Use their observations and ideas to suggest answers to questions				
Gathering and recording data		Gather and record data to help in answering questions	Gather and record data to help in answering questions	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables		Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Reporting on findings from scientific enquiries				include oral and written explanations, displays or presentations of results and conclusions Identify differences, similarities or changes related to simple scientific ideas and processes	include oral and written explanations, displays or presentations of results and conclusions Identify differences, similarities or changes related to simple scientific ideas and processes	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	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

Use existing scientific evidence				Use straightforward scientific evidence to answer questions or to support their findings.	Use straightforward scientific evidence to answer questions or to support their findings.	Identify scientific evidence that has been used to support or refute ideas or arguments	Identify scientific evidence that has been used to support or refute ideas or arguments
Knowledge of Scientific concepts							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chemistry and Physics strands							
Materials and properties.		Know the name of the materials an object is made from. Know about the properties of everyday materials.	Know how materials can be changed by squashing, bending, twisting and stretching. Know why a material might or might not be used for a specific job.	Know how some forces require contact and some (magnetic) do not, giving examples. Know about and explain how magnets attract only Iron, Nickel, Cobalt and stainless steel (alloy) not all metals. Predict whether magnets will attract or repel depending on which poles are	Identify and name appliances that require electricity to function. Construct a series circuit. Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers). Predict and test whether a lamp	Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets. Know and explain how a material dissolves to form a solution – make salt crystals. Know and show how to recover a substance from a solution. Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating).	Draw circuit diagrams using correct symbols. Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer. Know how fossils can be used to find out about the past.

				<p>facing and give a reason.</p> <p>Compare and group rocks based on their appearance and physical properties, giving reasons.</p> <p>Know how soil is made and how fossils are formed.</p> <p>Know about and explain the difference between sedimentary, metamorphic and igneous rock.</p>	<p>will light within a circuit.</p> <p>Know the function of a switch.</p> <p>Know the difference between a conductor and an insulator; giving examples of each.</p>	<p>Know and demonstrate that some changes are reversible and some are not.</p> <p>Know how some changes result in the formation of a new material and that this is usually irreversible.</p> <p>Know what gravity is and its impact on our lives.</p> <p>Identify and know the effect of air and water resistance.</p> <p>Identify and know the effect of friction.</p> <p>Explain how levers, pulleys and gears allow a smaller force to have a greater effect.</p>	
Vocabulary		<p>material hard, soft, stretchy, shiny, dull and rough</p>	<p>Suitability Properties transparent, translucent and opaque. waterproof, traction, rigid, flexible.</p>		<p>series circuits, electricity, current, electrons, cells, wires, bulbs, switches and buzzers, conductor, insulator</p>	<p>hardness, solubility, transparency, conductivity, [electrical & thermal]</p> <p>solids, liquids and gases. Dissolve and solution melting, freezing and evaporating. reversible and irreversible</p>	<p>series circuits, electricity, current, electrons, cells, wires, bulbs, switches and buzzers, conductor, insulator volts</p>

Seasonal changes. Light Earth and Space States of matter		Name the seasons and know about the type of weather in each season and how day length varies.	Know about the climate zones of the UK and Kenya (cross-curricular links Geography books). Know seasons are different around the world.	Know that dark is the absence of light. Know that light is needed in order to see and is reflected from a surface. Know and demonstrate how a shadow is formed and explain how a shadow changes shape throughout the day. Know about the danger of direct sunlight and describe how to keep protected.	Investigate the temperature at which materials change state. Know the part played by evaporation and condensation in the water cycle and to connect the rate of evaporation with temperature. Group materials based on their state of matter (solid, liquid, gas).	Know about and explain the movement of the Earth and other planets relative to the Sun. Know about and explain the movement of the Moon relative to the Earth. Know and demonstrate how night and day are created. Describe the Sun, Earth and Moon (using the term spherical bodies).	Know how light travels in straight lines. Know and demonstrate how we see objects by refraction through different features in the eye. Explain short and long sight. Know why shadows have the same shape as the object that casts them and how shadows are different across the seasons.
Vocabulary		seasons, spring, summer,	Climate, Equator, Northern hemisphere, Southern hemisphere	reflection, shiny surfaces, straight lines,	water cycle, evaporation, condensation,	relative movement, orbit, trajectory, gravity,	refraction, eye, lens, cornea, retina, concave

		autumn and winter. Weather		shadow, opaque	solid, liquid and gases.	tides, spring tide, neap tide.	and convex, short and long sight, shadows, opaque
Biology strands <ul style="list-style-type: none"> • Plants • Living things and their habitats • Animals, including humans • Evolution and Inheritance 							
Structure and function		Identify and describe the basic structure of a variety of common flowering plants, including trees. (this is has already been extended on MTP to stem, roots etc) Know and name a variety of common wild and garden plants, including	Identify structure and features of bulbs and seeds	Know the function of different parts of flowering plants and trees. Know about the skeletal and muscular system of humans and some animals for support, protection and movement. Missing from MTP	Identify and name the parts of the human digestive system. Know the functions of the organs in the human digestive system. Identify and know the different types of human teeth. Know the functions of	Identify and know the structure of sexual reproductive system	Identify and name the main parts of the human circulatory system. Know the function of the heart, blood vessels and blood.

		<p>deciduous and evergreen trees</p> <p>Know the name of parts of the human body that can be seen including the senses.</p>			<p>different human teeth. Know how sound is made, associating some of them with vibrating.</p> <p>Know how sound travels through a medium from a source to our ears.</p> <p>Know the correlation between pitch and the object producing a sound.</p> <p>Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Know what happens to a sound as it travels away from its source.</p>		
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Vocabulary		wild plants garden plants weed deciduous evergreen stem, root, petal, flower, trunk, bark, leaves. head, nose, ears, throat, arms, elbows, wrist, legs, knees, ankles, shoulders, stomach, spine, hips.	Flower bud, tunic, basal plate, roots and scales, seed coat, seed scar, food storage (energy)	flowers and filament, stigma, anther, style, ovary, ovule, sepal. pollinators, pollen, seeds, endoskeleton, vertebrate skull, vertebral column, femur, tibia, ulna, fibula, tibia, radius, pelvis, ribcage, humerus, scapula, clavicle, voluntary and involuntary muscles, biceps, triceps, quadriceps, soleus, abdominal, deltoid, pectoral, trapezius, facial, contract, relax	mouth, teeth, esophagus, stomach, liver, small intestine, pancreas, large intestine, anus incisor, molar, pre-molar, canine longitudinal waves, vibration, medium, solid, liquid, gas, pitch, volume	egg, sperm, fertilisation, embryo, placenta, fallopian tubes, uterus, ejaculation, penis, testes, womb, puberty.	circulatory system, heart, blood vessels, oxygen, nutrients, hormones, waste products, trachea, lungs, alveoli, capillaries, veins, diaphragm, arteries
Classifying		Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds.	Classify things by living, dead or never lived		Use classification keys to group, identify and name living things including flowering and non-flowering plants (mosses/		Classify living things including vertebrates and invertebrates into broad groups according to observable characteristics and based on

					<p>ferns/ seaweed).</p> <p>Use classification keys to group, identify and name vertebrate animals into groups such as fish, amphibians, reptiles, birds and mammals and invertebrates into snails and slugs, worms, spiders, and insects. Know how changes to an environment could endanger living things.</p>	<p>similarities and differences.</p> <p>Know how living things have been classified.</p> <p>Give reasons for classifying plants and animals in a specific way.</p>
Vocabulary		<p>classify, amphibian, reptile, mammal, fish, birds,feathers, scales, fur, cold blooded, warm blooded.</p>	<p>living, dead, never been alive. MRS GREN movement, growth, sensitivity, reproduction, nutrition, excretion.</p>		<p>vertebrates, fish, amphibians, reptiles, birds and mammals. invertebrates into snails and slugs, worms, spiders, and insects.</p>	<p>vertebrates, fish, amphibians, reptiles, birds and mammals. invertebrates into snails and slugs, worms, spiders, and insects. features, appearances,</p>

					endanger, extinct, survival		characteristics, classify
Food Chains		Know and classify animals by what they eat (carnivore, herbivore and omnivore).	Name some different sources of food for animals. Know about and explain a simple food chain producer, predator and prey.		Use and construct food chains to identify producers, predators, prey and decomposers.		
Vocabulary		Carnivore, herbivore, omnivore.	food chain, herbivore, carnivore and omnivore, producer, predator and prey.		food chain, producers, predators, prey and decomposers		
Reproduction			Know and explain how seeds and bulbs grow into plants. Know the basic stages in a life cycle for animals, (including humans).	Know the plant life cycle, especially the importance of flowers.		Know the life cycle of different living things e.g. mammal, amphibian, insect and bird. Know the differences between different life cycles. Know the process of reproduction in plants including sexual and asexual reproduction. Know the process of reproduction in animals. Create a timeline to indicate stages of	

						growth in humans including puberty.	
Vocabulary			germination, shoots, seed dispersal, bulb, seeds, photosynthesis, energy	flowers and filament, stigma, anther, style, ovary, ovule, sepal. pollinators, pollen, seeds		sexual reproduction asexual reproduction egg, sperm, fertilisation, embryo, placenta, fallopian tubes, uterus, ejaculation, penis, testes, womb, puberty.	
Growth and survival			<p>Know what plants need in order to grow and stay healthy (water, light & suitable temperature).</p> <p>Know how a specific habitat provides for the basic needs of things living there (plants and animals).</p> <p>Match living things to their habitat and identify animals and plants in micro-habitats.</p> <p>Know why exercise, a balanced diet and good hygiene are important for humans. Find out about and describe the basic needs of animals,</p>	<p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Know how water is transported within plants.</p> <p>Know about the importance of a nutritious, balanced diet and that humans cannot make their own food BUT plants can.</p>	Know how changes to an environment could endanger living things.		<p>Know the impact of diet, exercise, drugs and lifestyle on health.</p> <p>Know the ways in which nutrients and water are transported in animals, including humans.</p> <p>Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).</p> <p>Know how animals and</p>

			including humans, for survival (water, food and air). missing from MTP				plants are adapted to suit their environment. Link adaptation over time to evolution. Know about evolution and can explain what it is. Know how the Earth and living things have changed over time.
Vocabulary			habitat and micro-habitat, shelter, conditions, survival Carbohydrates, proteins, dairy, vegetables, fats	Carbohydrates, proteins, dairy, vegetables, fats, minerals and vitamins roots and xylem stem leaves and stomata nutrients evaporation, reproduction (of plants), photosynthesis, chlorophyll	endanger, extinct, survival, environmental impact		vertebrate invertebrate adaption evolution Water transportation, small intestine, blood, hydration, elimination, cells, waste materials

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately. Three characteristics of effective teaching and learning are:

- playing and exploring - children investigate and experience things, and 'have a go'
- active learning - children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things

In addition, the Prime Areas of Learning (Personal, Social and Emotional Development, Communication and Language and Physical Development) underpin and are an integral part of children's learning in all areas.

EYFS (Statutory)

This document demonstrates which statements from the 2020 Development Matters are prerequisite skills for computing within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for computing. The most relevant statements for computing are taken from the following areas of learning:

• **Personal, Social and Emotional Development** • **Physical Development** • **Understanding the World** • **Expressive Arts and Design**

Three and Four-Year-Olds	Personal, Social and Emotional Development		Remember rules without needing an adult to remind them.
	Physical Development		Match their developing physical skills to tasks and activities in the setting.
	Understanding the World		Explore how things work.
EYFS	Personal, Social and Emotional Development		Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'.
	Physical Development		Develop their small motor skills so that they can use a range of tools competently, safely and confidently
	Expressive Arts and Design		Explore, use and refine a variety of artistic effects to express their ideas and feelings.
ELG	Personal, Social and Emotional Development	Managing Self	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, Know right from wrong and try to behave accordingly.
	Expressive Arts and Design	Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Early Years Foundation Stage

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Consideration for learners with SEND in Science

At Cayton School science lessons are meticulously considered to enable the learning for children with SEND. Our curriculum plans aim to pre-teach, providing some learners with the opportunity to learn new vocabulary and concepts in advance of a lesson in a small group setting. Misconceptions are minimalised by ensuring content is taught in a logical and progressive order across the school's curriculum and at the beginning of new learning misconceptions relevant to the subject area are pre-empted and addressed. Children are exposed to the equipment and nature of the learning (especially for experiments and practical activities) to spark engagement and interest in the upcoming lesson. Cayton school science lessons are often very practical, collaborative, busy and fun so to consider learners with sensory impairments and physical disabilities teachers maintain a calm learning environment by ensuring clear routines and organised workspaces are used. Teachers at Cayton School carefully plan, and always test practical experiments before the lesson. They give clear step-by-step instructions, whether this be using visuals cues and/or more precise steps for learners needing additional guidance. Teaching assistants are planned for to encourage the learner to participate and maintain focus. Children are provided with topical word banks and picture cards that the learner can point or refer to when explaining scientific processes. We make sure learners understand the purpose of each step and that they can link scientific content to what they are doing. Abstract concepts are brought to life through concrete resources, roleplay, real life experiences and links to other areas of the curriculum to ensure that children are able to apply their scientific knowledge fully.

Strands	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Working scientifically skills							
Asking questions and planning		Ask simple questions and recognise that they can be answered in different ways	Ask simple questions and recognise that they can be answered in different ways	Ask relevant questions and use different types of scientific enquiries to answer them. setting up simple practical enquiries, comparative and fair tests	Ask relevant questions and use different types of scientific enquiries to answer them. setting up simple practical enquiries, comparative and fair tests	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Observing closely		Observe closely, using simple equipment	Observe closely, using simple equipment	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Identifying and classifying		Identify and classify	Identify and classify	Gather, record, classify and present data in a variety of ways to help in answering questions	Gather, record, classify and present data in a variety of ways to help in answering questions		

Answering questions		Use their observations and ideas to suggest answers to questions	Use their observations and ideas to suggest answers to questions				
Gathering and recording data		Gather and record data to help in answering questions	Gather and record data to help in answering questions	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Reporting on findings from scientific enquiries				include oral and written explanations, displays or presentations of results and conclusions Identify differences, similarities or changes related to simple scientific ideas and processes	include oral and written explanations, displays or presentations of results and conclusions Identify differences, similarities or changes related to simple scientific ideas and processes	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 Using 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 Using test results to make predictions to set up further comparative and fair tests

Use existing scientific evidence				Use straightforward scientific evidence to answer questions or to support their findings.	Use straightforward scientific evidence to answer questions or to support their findings.	Identify scientific evidence that has been used to support or refute ideas or arguments	Identify scientific evidence that has been used to support or refute ideas or arguments
Knowledge of Scientific concepts							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chemistry and Physics strands							
Materials and properties.		Know the name of the materials an object is made from. Know about the properties of everyday materials.	Know how materials can be changed by squashing, bending, twisting and stretching. Know why a material might or might not be used for a specific job.	Know how some forces require contact and some (magnetic) do not, giving examples. Know about and explain how magnets attract only Iron, Nickel, Cobalt and stainless steel (alloy) not all metals. Predict whether magnets will attract or repel depending on which poles are	Identify and name appliances that require electricity to function. Construct a series circuit. Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers). Predict and test whether a lamp	Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets. Know and explain how a material dissolves to form a solution – make salt crystals. Know and show how to recover a substance from a solution. Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating).	Draw circuit diagrams using correct symbols. Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer. Know how fossils can be used to find out about the past.

				<p>facing and give a reason.</p> <p>Compare and group rocks based on their appearance and physical properties, giving reasons.</p> <p>Know how soil is made and how fossils are formed.</p> <p>Know about and explain the difference between sedimentary, metamorphic and igneous rock.</p>	<p>will light within a circuit.</p> <p>Know the function of a switch.</p> <p>Know the difference between a conductor and an insulator; giving examples of each.</p>	<p>Know and demonstrate that some changes are reversible and some are not.</p> <p>Know how some changes result in the formation of a new material and that this is usually irreversible.</p> <p>Know what gravity is and its impact on our lives.</p> <p>Identify and know the effect of air and water resistance.</p> <p>Identify and know the effect of friction.</p> <p>Explain how levers, pulleys and gears allow a smaller force to have a greater effect.</p>	
Vocabulary		<p>material hard, soft, stretchy, shiny, dull and rough</p>	<p>Suitability Properties transparent, translucent and opaque. waterproof, traction, rigid, flexible.</p>		<p>series circuits, electricity, current, electrons, cells, wires, bulbs, switches and buzzers, conductor, insulator</p>	<p>hardness, solubility, transparency, conductivity, [electrical & thermal]</p> <p>solids, liquids and gases. Dissolve and solution melting, freezing and evaporating. reversible and irreversible</p>	<p>series circuits, electricity, current, electrons, cells, wires, bulbs, switches and buzzers, conductor, insulator volts</p>

Seasonal changes. Light Earth and Space States of matter		Name the seasons and know about the type of weather in each season and how day length varies.	Know about the climate zones of the UK and Kenya (cross-curricular links Geography books). Know seasons are different around the world.	Know that dark is the absence of light. Know that light is needed in order to see and is reflected from a surface. Know and demonstrate how a shadow is formed and explain how a shadow changes shape throughout the day. Know about the danger of direct sunlight and describe how to keep protected.	Investigate the temperature at which materials change state. Know the part played by evaporation and condensation in the water cycle and to connect the rate of evaporation with temperature. Group materials based on their state of matter (solid, liquid, gas).	Know about and explain the movement of the Earth and other planets relative to the Sun. Know about and explain the movement of the Moon relative to the Earth. Know and demonstrate how night and day are created. Describe the Sun, Earth and Moon (using the term spherical bodies).	Know how light travels in straight lines. Know and demonstrate how we see objects by refraction through different features in the eye. Explain short and long sight. Know why shadows have the same shape as the object that casts them and how shadows are different across the seasons.
Vocabulary		seasons, spring, summer,	Climate, Equator, Northern hemisphere, Southern hemisphere	reflection, shiny surfaces, straight lines,	water cycle, evaporation, condensation,	relative movement, orbit, trajectory, gravity,	refraction, eye, lens, cornea, retina, concave

		autumn and winter. Weather		shadow, opaque	solid, liquid and gases.	tides, spring tide, neap tide.	and convex, short and long sight, shadows, opaque
Biology strands <ul style="list-style-type: none"> • Plants • Living things and their habitats • Animals, including humans • Evolution and Inheritance 							
Structure and function		Identify and describe the basic structure of a variety of common flowering plants, including trees. (this is has already been extended on MTP to stem, roots etc) Know and name a variety of common wild and garden plants, including	Identify structure and features of bulbs and seeds	Know the function of different parts of flowering plants and trees. Know about the skeletal and muscular system of humans and some animals for support, protection and movement. Missing from MTP	Identify and name the parts of the human digestive system. Know the functions of the organs in the human digestive system. Identify and know the different types of human teeth. Know the functions of	Identify and know the structure of sexual reproductive system	Identify and name the main parts of the human circulatory system. Know the function of the heart, blood vessels and blood.

		<p>deciduous and evergreen trees</p> <p>Know the name of parts of the human body that can be seen including the senses.</p>			<p>different human teeth. Know how sound is made, associating some of them with vibrating.</p> <p>Know how sound travels through a medium from a source to our ears.</p> <p>Know the correlation between pitch and the object producing a sound.</p> <p>Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Know what happens to a sound as it travels away from its source.</p>		
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Vocabulary		wild plants garden plants weed deciduous evergreen stem, root, petal, flower, trunk, bark, leaves. head, nose, ears, throat, arms, elbows, wrist, legs, knees, ankles, shoulders, stomach, spine, hips.	Flower bud, tunic, basal plate, roots and scales, seed coat, seed scar, food storage (energy)	flowers and filament, stigma, anther, style, ovary, ovule, sepal. pollinators, pollen, seeds, endoskeleton, vertebrate skull, vertebral column, femur, tibia, ulna, fibula, tibia, radius, pelvis, ribcage, humerus, scapula, clavicle, voluntary and involuntary muscles, biceps, triceps, quadriceps, soleus, abdominal, deltoid, pectoral, trapezius, facial, contract, relax	mouth, teeth, esophagus, stomach, liver, small intestine, pancreas, large intestine, anus incisor, molar, pre-molar, canine longitudinal waves, vibration, medium, solid, liquid, gas, pitch, volume	egg, sperm, fertilisation, embryo, placenta, fallopian tubes, uterus, ejaculation, penis, testes, womb, puberty.	circulatory system, heart, blood vessels, oxygen, nutrients, hormones, waste products, trachea, lungs, alveoli, capillaries, veins, diaphragm, arteries
Classifying		Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds.	Classify things by living, dead or never lived		Use classification keys to group, identify and name living things including flowering and non-flowering plants (mosses/		Classify living things including vertebrates and invertebrates into broad groups according to observable characteristics and based on

					<p>ferns/ seaweed).</p> <p>Use classification keys to group, identify and name vertebrate animals into groups such as fish, amphibians, reptiles, birds and mammals and invertebrates into snails and slugs, worms, spiders, and insects. Know how changes to an environment could endanger living things.</p>	<p>similarities and differences.</p> <p>Know how living things have been classified.</p> <p>Give reasons for classifying plants and animals in a specific way.</p>
Vocabulary		<p>classify, amphibian, reptile, mammal, fish, birds,feathers, scales, fur, cold blooded, warm blooded.</p>	<p>living, dead, never been alive. MRS GREN movement, growth, sensitivity, reproduction, nutrition, excretion.</p>		<p>vertebrates, fish, amphibians, reptiles, birds and mammals. invertebrates into snails and slugs, worms, spiders, and insects.</p>	<p>vertebrates, fish, amphibians, reptiles, birds and mammals. invertebrates into snails and slugs, worms, spiders, and insects. features, appearances,</p>

					endanger, extinct, survival		characteristics, classify
Food Chains		Know and classify animals by what they eat (carnivore, herbivore and omnivore).	Name some different sources of food for animals. Know about and explain a simple food chain producer, predator and prey.		Use and construct food chains to identify producers, predators, prey and decomposers.		
Vocabulary		Carnivore, herbivore, omnivore.	food chain, herbivore, carnivore and omnivore, producer, predator and prey.		food chain, producers, predators, prey and decomposers		
Reproduction			Know and explain how seeds and bulbs grow into plants. Know the basic stages in a life cycle for animals, (including humans).	Know the plant life cycle, especially the importance of flowers.		Know the life cycle of different living things e.g. mammal, amphibian, insect and bird. Know the differences between different life cycles. Know the process of reproduction in plants including sexual and asexual reproduction. Know the process of reproduction in animals. Create a timeline to indicate stages of	

						growth in humans including puberty.	
Vocabulary			germination, shoots, seed dispersal, bulb, seeds, photosynthesis, energy	flowers and filament, stigma, anther, style, ovary, ovule, sepal. pollinators, pollen, seeds		sexual reproduction asexual reproduction egg, sperm, fertilisation, embryo, placenta, fallopian tubes, uterus, ejaculation, penis, testes, womb, puberty.	
Growth and survival			<p>Know what plants need in order to grow and stay healthy (water, light & suitable temperature).</p> <p>Know how a specific habitat provides for the basic needs of things living there (plants and animals).</p> <p>Match living things to their habitat and identify animals and plants in micro-habitats.</p> <p>Know why exercise, a balanced diet and good hygiene are important for humans. Find out about and describe the basic needs of animals,</p>	<p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Know how water is transported within plants.</p> <p>Know about the importance of a nutritious, balanced diet and that humans cannot make their own food BUT plants can.</p>	Know how changes to an environment could endanger living things.		<p>Know the impact of diet, exercise, drugs and lifestyle on health.</p> <p>Know the ways in which nutrients and water are transported in animals, including humans.</p> <p>Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).</p> <p>Know how animals and</p>

			including humans, for survival (water, food and air). missing from MTP				plants are adapted to suit their environment. Link adaptation over time to evolution. Know about evolution and can explain what it is. Know how the Earth and living things have changed over time.
Vocabulary			habitat and micro-habitat, shelter, conditions, survival Carbohydrates, proteins, dairy, vegetables, fats	Carbohydrates, proteins, dairy, vegetables, fats, minerals and vitamins roots and xylem stem leaves and stomata nutrients evaporation, reproduction (of plants), photosynthesis, chlorophyll	endanger, extinct, survival, environmental impact		vertebrate invertebrate adaption evolution Water transportation, small intestine, blood, hydration, elimination, cells, waste materials

Implementation

A clear and effective progression of science knowledge and skills are mapped out from Early Years Foundation Stage through to Year 6. Our knowledge and skills curriculum progression map covers statutory objectives, but also provides additional linked learning opportunities to ensure knowledge and skills are progressively built upon from year to year.

Mapped out teaching of useful and powerful science vocabulary that our children will be exposed to across the year groups. Children will be encouraged to use technical terminologies to articulate scientific concepts clearly and precisely and assist in making their thinking clear, both to themselves and others.

Children will be challenged in 'common scientific misconceptions' which will enable them through points of transition and enable progression of knowledge without significant difficulties in understanding.

We supplement our weekly teaching of science with science days/weeks, focussed on skills progression. We also plan offsite learning opportunities to deepen our pupils' understanding of key knowledge.

Our 'Beach and forest school' sessions allow children to experience science first hand in our local environment and think about wider scientific issues such as recycling, habitat loss and coastal erosion. These experiences allow children to foster an understanding of looking after their world and the greater impact humans can make. These are practical sessions where children are often involved in working scientifically for example making close observations, measuring and gaining data.

Children at Cayton School will be able to use a range of scientific equipment to help with carrying out investigations and to fulfil their role as developing scientists.

Impact

Outcomes in books evidence a thorough and effective science curriculum and demonstrate the children's acquisition of both scientific knowledge and skills.

In lesson observations, children ask perceptive questions, show high levels of engagement and are curious about their learning. Teachers' subject knowledge is excellent and their enthusiasm for the subject is evident. Pupil voice evidences that children have a coherent knowledge and understanding of science. They are curious about the world around them and enjoy their science lessons. When asked, they confidently explain how their science learning relates to the wider world and why learning about science is important for their future.