



SCIENCE INTENT - to what do we aspire for our children?

The Science curriculum fosters a natural curiosity of the child, encourages respect for living organisms and the physical environment and provides opportunities for critical evaluation of evidence. We believe that science encompasses the acquisition of knowledge, concept, skills and positive attitudes. Now more than ever, we recognise the role that science plays in everyday life and it is imperative for children to have a rich understanding of the world they live in and to develop the skills to be able to ask questions and solve problems as they become young adults in an ever changing landscape.

At Stoke Park Primary School, the science curriculum supports the school's three core values in the following ways:

At Stoke Park Primary School, we believe that children should '**Be Kind**' '**Be Proud**' and '**Strive for Success**' and these core values underpin our science teaching and learning. Through this approach, we believe children should leave Stoke Park Primary as inquisitive, articulate, and knowledgeable young scientists.

Be kind – Through our science curriculum, children are encouraged to understand the need to be kind to the environment and develop a knowledge rich understanding of the world around them which they will take with them beyond their time in the primary setting.

Be proud – As the children explore different elements of scientific enquiry, we believe that they should take pride in explaining and sharing their own achievements and those of their peers as they acquire knowledge and develop their scientific skills.

Strive for Success – We aim to provide children with access to a science curriculum where they will develop young scientists who can communicate their understanding both verbally and in written form through a rich vocabulary and the necessary oracy skills.

At Stoke Park we want to develop a culture of scientific values and skills where asking questions, working collaboratively, testing hypotheses and reflecting on lines of enquiry is part of the everyday life of the classroom. We aim to develop students who feel empowered and passionate to engage with science beyond their time in primary school and take the fundamental skills and knowledge into the next stage of their lives as young scientists.

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



At Stoke Park, we aim to do this by delivering a curriculum rich in knowledge and skills which inspires our children and supports them on the beginning of a scientific journey which will last well beyond their years in primary.

At Stoke Park, our science curriculum ensures that children acquire rich and broad scientific knowledge from EYFS through to Year 6 which they do through lessons which also develop the core 'working scientifically skills' progressively through their time at primary. These skills are:

Working scientifically



<div>EYFS</div>	<div>KS1</div>	<div>Lower KS2</div>	<div>Upper KS2</div>
Talk about patterns	Collect and record data	Use evidence to support	Identify scientific evidence to support or refute
Talk about change	Suggest answers	Draw simple conclusions	Consider trust in results
Observe	Identify and classify	Make predictions	Report and present
Identify similarities and differences	Perform simple tests	Record findings	Use results for further comparative and fair tests
	Observe	Present data	Record more complex data
	Ask simple questions	Accurate measurement	Take repeated readings
		Systematic observations	Recognise and control variables
		Set up simple tests	Plan enquiries
		Types of enquiry to answer	

Long Term Sequence:

In EYFS, children begin their journey as young scientists through a child-led curriculum based around their interests and needs.



Understanding the World

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension

Science is covered in Understanding the world	Nursery – how is this achieved?	Reception – how is this achieved?	Key vocabulary	Core Books that link to foundational experiences & knowledge
<p><u>Understanding the World</u></p> <p>Past and Present Talk about the lives of the people around them and their roles in society. Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class. Understand the past through settings, characters and events encountered in books read in class and storytelling. People, Culture and Communities Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.</p>	<ul style="list-style-type: none">- Children explore the natural world by participating in weekly Forest School sessions.- Exploration of the physical world around them allows children to begin to explore material properties. Simple experiments help children develop their scientific skills by observing, discussing similarities and differences and talking about change.- Adults introduce children to simple scientific language through scaffolding, narrations and simple explanations.- Daily routines such as discussions on the weather ensure that children understand the importance of the natural world and <u>being</u> to observe changes in it.	<ul style="list-style-type: none">- Children explore the natural world by participating in weekly Forest School sessions. In these sessions, children might set different challenges to explore their natural environment which include basic research/data gathering and observation tasks.- Exploration of the physical world around them allows children to begin to explore material properties. Simple experiments help children develop their scientific skills by observing, discussing similarities and differences and talking about change. Language expectations and more specific vocabulary linked to patterns and observations follows on from Nursery.- Adults introduce children to simple scientific language through scaffolding, narrations and simple explanations.- Daily routines such as discussions on the weather ensure that children	<p>Hard, soft, cold, warm, big, small, short, tall, frozen, melting, bumpy, smooth,</p> <p>see hear feel taste smell</p>	<ul style="list-style-type: none">- A selection classic nursery rhymes and children's stories create opportunities for simple experiments and thematic learning in the natural world. <p>Examples include:</p> <ul style="list-style-type: none">- Humpty Dumpty- The Very Hungry Caterpillar- Where the <u>Wild</u> Things Are- Rumble in the Jungle.



Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class. Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.

The Natural World

Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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Continuous Provision Play experiences with provocations for science based thinking and talk

- Water and sand tray
- Sensory play e.g. gloop, cornflour, play dough,
- Small world
- Book corner
- Outdoor environment (binoculars, magnifying glasses, ID sheets)

Once into KS1 and KS2, science is taught discreetly through weekly sessions which build on prior knowledge and provide children with both the knowledge and skills required to continue their journey as young scientists.









	EYFS Understanding the world	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class		Living things and their habitats (+ revisit modules)		Living things and their habitats	Living things and their habitats	Living things and their habitats
		Plants	Plants	Plants			
		Animals, including humans (+ revisit modules)	Animals, including humans (+ revisit modules)	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans
							Evolution and inheritance
Physics		Seasonal changes (+ revisit module)		Light			Light
				Forces and magnets		Forces	
					Electricity		Electricity
					Sound		
Chemistry	Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	Everyday materials	Use of everyday materials			Properties and change of materials	
				Rocks (+ revisit module)			
					States of matter		

Example Year 1:

SCIENCE National Curriculum Expectations KS1	Year 1		
	Autumn	Spring	Summer
Plants <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. 	Introduce Revisit		Revisit
Animals, including humans <ul style="list-style-type: none"> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	Introduce	Introduce and Revisit	Revisit
Everyday materials <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 together a variety of everyday materials on the basis of their simple physical properties. 			Introduce
Seasonal changes <ul style="list-style-type: none"> observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. 	Introduce		Revisit



Example Year 6:

SCIENCE National Curriculum Expectations Year 6	Year 6		
	Autumn	Spring	Summer
Living things and their habitats Pupils should be taught to: <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics 	 Introduce		
Animals including humans Pupils should be taught to: <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (Summer) describe the ways in which nutrients and water are transported within animals, including humans (Summer) 		 Introduce	 Introduce water transport
Evolution and inheritance Pupils should be taught to: <ul style="list-style-type: none"> 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 			 Introduce
Light Pupils should be taught to: <ul style="list-style-type: none"> recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 	 Introduce		
Electricity Pupils should be taught to: <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram 		 Introduce	

‘Golden Thread’: Oracy: At Stoke Park Primary, we recognise the vital role that oracy plays in the lives of our children, both during their time in primary school and for the rest of their lives. Research shows that oracy not only acts as a powerful tool for learning but is a key skill in itself which employers actively seek. By ensuring that children have explicit opportunities to develop their oracy skills as well as opportunities to learn through oracy across the curriculum, we aspire to create young adults who are able to work confidently, articulately and collaboratively.

In science, children are given regular opportunities to ask questions, use discussion as a tool to explore new concepts and are often asked to justify, explain or present their understanding of a concept or set of knowledge. By embedding rich oracy opportunities into the teaching of science, children not only become more confident and competent orators and listeners but will also explore scientific concepts and knowledge more deeply and organically

IMPLEMENTATION - how will we deliver the curriculum?

Linking curriculum and pedagogy: subject specific approaches i.e. modular

At Stoke Park, Science is taught weekly as we recognise its place as a core subject. Class teachers deliver sessions where skills progress cumulatively through the academic year and across the year groups. Content is revisited in a spiralling approach so that all children have the opportunity to embed the substantive and disciplinary knowledge required.

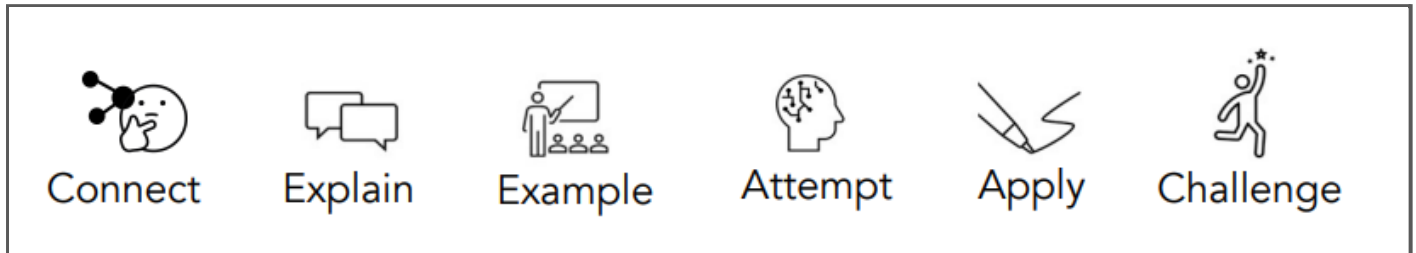
Within each unit, children are provided a unit specific ‘knowledge organiser’ which provides them with key vocabulary and imagery to support their retention and embedding of knowledge. These are supplemented by a knowledge note to support each lesson which contains key vocabulary and information laid out using the



principles of dual coding to support all children to access the content of each lesson. Each lesson is framed by a question which can be adapted but builds on the progression of knowledge across the unit of work.

The CUSP curriculum supports teachers to plan their sequence of learning by providing cumulative quizzes which ensure that children have secured the knowledge from each session before moving onto the next part of the sequence. This gives teachers regular and immediate feedback on which to respond to learning gaps.

Lesson design: Each lesson follows the principles of CEEAAC:



Connect - this ensures that children are reminded of their prior learning (whether this be from a previous session, unit or year group.)

Explain - This introduces children to the new material being covered in the session.

Example - An example follows the 'Explain' using a model or practical example.

Attempt - Children will have a go at the desired skill with support from the teacher.

Apply - They will then apply this in a similar context independently.

Challenge - This element should deepen or extend the learning.

The cumulative quiz which runs through each CUSP unit allows teachers to assess children's knowledge acquisition through the unit.

Each lesson is supported by a question and a knowledge note which provides children with images which follow the principles of dual coding and tier 2 and tier 3 vocabulary. Teachers can refer to this and by including them in children's books, they are able to refer back to them throughout a unit.

Curriculum enrichment will include:

- building links with science departments in our partner secondaries.
- inviting scientists in from Bristol and the surrounding area for talks/demonstrations/presentations
- Science Week focus
- Trust-wide collaboration with other primaries including 'Science Fairs'

Reading across the curriculum:

- A rich and diverse range of reading texts across the curriculum ensure that science is often taught with links to other areas of the curriculum e.g. Y5 Space - biographies of Mae Jemerson, Y6 Circulatory system explanations linked to Pig Heart Boy Nursery - Minibeasts linked with The Very Hungry Caterpillar.

IMPACT - how do we know our curriculum is effective?

Pupil Voice The impact of this curriculum will ensure all children make progress regardless of their starting points. Children will talk about the 'why' behind their learning and build upon previous knowledge and skills. Children will be able to talk about core knowledge they've acquired alongside the



opportunities they've had to develop their skills as young scientists.

High quality outcomes: Books demonstrate a high level of pride being taken in children's work where they are setting high expectations of themselves. Outcomes will show that children are attaining a deep level of understanding and knowledge about scientific concepts but beyond this are seeing themselves as young scientists who are encouraged and allowed to ask questions, develop their scientific skills and test hypotheses.