Stanton Harcourt
CE Primary School

Science Curriculum Handbook

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Curriculum Statement

Intent

At Stanton Harcourt, we understand the growing significance of science and engineering in our modern world. Regardless of whether or not children grow up to pursue careers in science or engineering industries, we firmly believe that by providing an environment centred around the wonder of STEM, learning experiences will enhance their scientific literacy, build science capital and improve critical thinking skills. The children should be taught that their scientific learning journey is one which involves asking questions and making mistakes and that this allows them to make real and valuable connections with the world around them.

At Stanton, we provide children with high quality, child-led practical learning experiences, which enable them to make meaningful links within the classroom and with the outside world. We encourage scientific discussions, thereby fostering critical thinking skills, scientific literacy and building science capital. We nurture and develop children's curiosity and excitement towards science by encouraging them to think creatively about 'key concept questions' and we try to break down perceptions about what science is, what scientists do and who scientists are.

Pupils at Stanton have access to an engaging curriculum, where science links to many areas of their learning.

Each unit of science will begin with a KCV document (these have been carefully developed over time, combining the National Curriculum with our own vision and expectation for the teaching of science) being shared with the children. The document sets out what the children should have covered previously in relation to the topic, relevant vocabulary for their year group and beyond, and the knowledge and skills objectives that they will be aiming to achieve during that term (or those two terms).

The KCV documents have been carefully designed to ensure appropriate progression from one year group to another, from one unit of study to another. The scientific skills come from the National Curriculum expectations for Year 1/2, Year 3/4 and Year 5/6, and should be steadily developed over the course of a 2-year cycle by the staff involved.

Teachers are encouraged to ensure that the teaching sequence provided allows children to cumulatively build knowledge and skills as they progress through the unit.

Where appropriate to do so, teachers are encouraged to leave the classroom to engage pupils in their lessons (for example, by making use of the school's pond area and local parks during units of work on plants and animals).

Lessons always include an overarching objective, along with specific objectives framed as 'I know that...' for scientific knowledge and 'I know how to...' for scientific skills. Recording in books is aligned specifically with these learning objectives.

Throughout the year we will aim to ensure that the profile of Science remains high and that we take every opportunity to celebrate key events/ people in the STEM calendar. British Science Week is acknowledged through special assemblies, visitors, workshops and whole-school challenges, and culminates in a Science Fair. During this event, pupils are encouraged to undertake their own Science projects at home which are then showcased at the fair. As a school, we actively encourage strong links with the local community. Parental involvement through home-school projects and 'Stay & Learn' sessions enables this to be an important part of our science curriculum. During Term 4, all children participate in the 'Big Science Event' which allows small groups of children (Years 1-6) to devise their own question to be investigated, design a fair test and decide on appropriate methods of presenting their findings.

At Stanton Harcourt School we will ensure that the children develop a life-long passion for Science; adopt vital, transferable skills; and are given opportunities to achieve through a curriculum that is accessible to all. We believe that by following their own natural curiosity, all children can be scientists, and through our exciting and engaging curriculum and learning environment, we can help them to be confident scientific thinkers. Science offers many opportunities for pupils to work collaboratively with peers which links well with our vision statement of 'Living, Learning and Growing Together'.

Implementation

Science is taught weekly at our school, with lessons designed to encourage critical thinking and empower pupils to question the hows and whys of the world. We implement a spiral curriculum that revisits essential knowledge and skills with increasing complexity, allowing pupils to build on prior learning. Engaging recall activities promote regular reflection, ensuring new concepts are approached with confidence.

As highlighted in the Ofsted research review: Science (April 2021), we integrate "Working Scientifically" skills with conceptual understanding, providing relevant opportunities for scientific inquiry. At Stanton Harcourt, practical activities enhance individual skill progression and allow for comprehensive investigations.

Our written work aligns with specific learning objectives, ensuring direct support for lessons.

Science is celebrated throughout the year, with key events and notable scientists recognized during British Science Week. Activities include Collective Worship, guest visitors, workshops, whole-school challenges, and a Science Fair where pupils showcase their home-designed projects. Additionally, students in Years 1-6 participate in the ‘Big Science Event.’

Our Science Lead supports teachers in planning learning objectives, ensuring alignment with the KCV document and the National Curriculum. Strong subject knowledge is vital for delivering a robust science curriculum. Using Kapow, each lesson unit includes teacher videos and resources to develop subject knowledge, address misconceptions, and support ongoing professional development (CPD).

Science Leads from each EPA primary school meet regularly to share best practices. They also conduct book reviews throughout the year to ensure high-quality written work and ample opportunities for scientific learning.

The Science Lead conducts lesson observations to ensure that teaching quality meets at least a ‘good’ standard and aligns with Stanton’s educational intent. Each classroom features a working wall displaying termly science vocabulary and supportive photographic images.

Impact

The overall impact of Science lessons at our school should be that children are engaged, curious, ambitious and reflective. In other words, our children should enjoy their science lessons, with many pupils aspiring to become scientists, to study Science at a higher level, and to see Science as something that is both an exciting and essential part of their futures.

Children should look forward to their Science lessons, and should come to these sessions full of confidence, questions, and ideas for investigations. Most pupils (85%) will achieve at least ARE by the end of key stage two, with at least 35% of children being assessed at greater depth by the end of their time at primary school.

Recording

All Science work should be recorded in Science books. Each unit will see a KCV being stuck into the books. There will be evidence of one lesson per week. Recording in books should align specifically with the learning objective (children do not need to spend time recording the entirety of an investigation in their books). Where at all possible, recording should be handwritten by pupils (worksheets are only used where it is deemed more appropriate than handwritten work), of a high standard (underlined date, learning objective, piece of work), with diagrams (making us of a ruler when necessary) and tables drawn in pencil, but labelled/ filled in in pen. In the event that a lesson only requires photographic evidence, a clear photograph should be stuck into the child's book, with appropriate details of the learning objective for the lesson typed underneath the picture/s. There may sometimes be longer pieces of written work associated with the Science learning, such as biographies, diary entries, explanatory texts and non-chronological reports, but these will often be in English books. There should be clear progression of the recording of data handling, from pictograms through to Venn diagrams and line graphs

Assessment

Teachers assess each unit of science and make a summative assessment at the end of the school year. Learning Objectives in books are ticked by teachers after each lesson - one tick if partly achieved; two ticks if fully achieved.

Every lesson begins with a review of previous learning. For example, this can be the use of a low stakes quiz, recap of a skill or analysis of a picture, diagram, statement or scenario to revise and recall key scientific knowledge from previous learning.

Key Concept Questions are used to elicit understanding of a science unit. Teachers introduce these questions within lessons or as Purple Pen comments for children to demonstrate their understanding.

An end of year science assessment is undertaken to demonstrate the scientific knowledge and skills children have retained over the course of the year.

Teachers also use the portfolios of Greater Depth work to support and inform their judgements.

In Early Years, the children's Learning Journeys will reflect their learning in Understanding our World.

Inclusion

In our Science lessons, teachers aim to ensure that every child is valued, every child is challenged and every child is appropriately supported.

Vocabulary banks, carefully selected partners and groups, and writing frames are all part of the class teacher's consideration when preparing their lessons. Lessons are engaging and adaptations ensure all pupils can access every lesson.

In our approach to science education, we prioritise an inclusive environment where pupils are encouraged to learn from their mistakes and engage in genuine experimentation with equipment and resources. We focus on aligning written work with specific objectives, allowing more time for active participation and meaningful discussions. This emphasis on 'talking' and 'doing' reflects our commitment to fostering a hands-on, engaging learning experience for all students.

Cultural Capital

Research evidence shows that the more science capital a young person has, the more likely s/he is to aspire to continue with science post-16 and to see themselves as having a science identity. At Stanton, we understand that science capital includes all the science-related knowledge, attitudes, experiences and resources children acquire through life. We aim to expose the children at our school to enriching, valuable and immersive experiences which enables children to see themselves as scientists and to fully understand who scientists are and what they do. Throughout the year, we celebrate Science through workshops (Science Centre Oxford), visitors and trips. We celebrate British Science Week by holding whole-school Science projects and a Science Fair. Our hope is that building science capital will have a positive effect on young people's lives – not just in terms of encouraging more young people to continue into science, technology, engineering and mathematics (STEM) jobs, but more importantly, we hope that building science capital is a tool for social justice, to help improve people's lives and life chances.

Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1/2 A	Uses of Everyday Materials	Animals Including Humans	Plants	Big Science Event/ Investigation	Famous Scientists	Living Things & Their Habitats
Year 1/2 B	Uses of Everyday Materials	Seasonal Changes	Living Things & Their Habitats	Biodiversity	Plants	Animals Including Humans
Year 3/4 A	Sound	Electricity	Animals Including Humans	Big Science Event/ Investigation	States of Matter	Living Things & Their Habitats
Year 3/4 B	Light	Animals Including Humans	Plants	Biodiversity	Rocks	Forces & Magnets
Year 5/6 A	Animals, Including Humans	Electricity	Light	Big Science Event/ Investigation	Forces	Living Things and Their Habitats
Year 5/6 B	Properties of Materials	Living Things & Their Habitats	Earth and Space	Biodiversity	Evolution and Inheritance	Animals Including Humans

Curriculum Skills Progression - Science

Big Science Event (Working Scientifically)			
EYFS	**Year 1/2**	**Year 3/4**	**Year 5/6**
	Asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment. Performing simple tests. Identifying and classifying. Using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships

		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.	and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Seasons			
EYFS	**Year 1/2**	**Year 3/4**	**Year 5/6**
	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		

Animals Including Humans			
EYFS	**Year 1/2**	**Year 3/4**	**Year 5/6**
	Year 1 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	Year 3 Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Year 5 Describe the changes as humans develop to old age. Year 6 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

	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. Year 2 Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Year 4 Describe the simple functions of the basic parts of the digestive system in humans and identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.	way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.

Plants

EYFS	Year 1/2	Year 3/4	Year 5/6
	Year 1 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. Year 2 Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Year 3 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. 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. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	

Living Things and their Habitats

EYFS	Year 1/2	Year 3/4	Year 5/6
	Year 2 Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro- habitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	Year 4 Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.	Year 5 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Year 6 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.

Materials / States of Matter

EYFS	Year 1/2	Year 3/4	Year 5/6
	Year 1 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. Year 2 Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Year 4 Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Year 5 Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), 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, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in

			the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Rocks			
EYFS	**Year 1/2**	**Year 3/4**	**Year 5/6**
		Year 3 Compare and group together 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.	

Light

EYFS	Year 1/2	Year 3/4	Year 5/6
		Year 3 Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.	Year 6 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.

Forces and Magnets

EYFS	Year 1/2	Year 3/4	Year 5/6
		Year 3 Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	Year 5 Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. 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 a greater effect.

Sound

EYFS	Year 1/2	Year 3/4	Year 5/6
		Year 4 Identify how sounds are made, associating some of them with something vibrating. 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 vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.	

Electricity

EYFS	Year 1/2	Year 3/4	Year 5/6
		Year 4 Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.	Year 6 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.

Earth and Space

EYFS	Year 1/2	Year 3/4	Year 5/6
			Year 5 Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. 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.

Evolution and Inheritance

EYFS	Year 1/2	Year 3/4	Year 5/6
			Year 6 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.