Spaxton

Founded 1860

C of E Primary School

Our Curriculum

Science

'Together we Flourish and Achieve'

Science Curriculum

Contents

Intent

At Spaxton, in Science we believe that all children should:

- **Develop Curiosity and Understanding**: Our science curriculum nurtures children's natural curiosity about the world around them. It helps them ask questions and seek answers through observation and experimentation.
- **Build Knowledge and Skills**: Science provides a foundation of knowledge about the natural world. It also develops important skills such as critical thinking, problem-solving, and the ability to conduct investigations.
- **Have a relevance to Everyday Life**: Understanding scientific concepts helps children make sense of everyday phenomena and see the relevance of science in their own lives. This can include everything from understanding weather patterns to how plants grow.
- **Prepare for Future Learning**: A strong foundation in science prepares students for more advanced study in secondary school and beyond. It also helps them develop a positive attitude towards science and its applications.
- **Encourage Scientific Literacy**: Teaching science helps children become scientifically literate, enabling them to make informed decisions and understand the impact of science on society and the environment.
- **Promote Inquiry and Investigation**: Science at Spaxton emphasises inquiry-based learning, where students learn by doing. This approach helps them develop a deeper understanding of scientific concepts and the scientific method.

This is underpinned by our school curriculum intent which in turn is underpinned by the QET principles.

At Spaxton, we deliver a broad and balanced curriculum to all our pupils. Through our ambitious curriculum offer, that has been carefully designed to ensure it is sequential and progressive through each stage, we believe it allows:

1. **Holistic Development**: It supports the overall development of our children, addressing their academic, social, emotional, and physical needs. This approach ensures that our pupils at Spaxton are well-rounded and prepared for next stage of learning and any other future challenges.
2. **Engagement and Motivation**: A varied curriculum keeps our pupils engaged and motivated by offering a range of subjects and activities. Our broad and balanced curriculum offer helps cater to different interests and learning styles, making education more enjoyable and effective for all.
3. **Critical Thinking and Problem-Solving**: Exposure to a wide range of subjects encourages critical thinking and problem-solving skills. Our pupils learn to make connections between different areas of knowledge, enhancing their cognitive abilities.
4. **Cultural Awareness and Respect**: Our broad curriculum includes subjects like history, geography, and the arts, which help our pupils understand and appreciate different cultures and perspectives. This fosters respect and empathy for others. This is particularly important due to our village rural location.
5. **Preparation for Future Learning**: Our balanced curriculum provides a strong foundation in core subjects like English and maths while also introducing pupils to other areas of knowledge. This prepares them for more specialised learning in secondary education and beyond

6. **Personal Growth and Well-being**: Subjects like physical education, music, and art contribute to pupils' physical and emotional well-being. They provide opportunities for self-expression, creativity, and physical activity, which are crucial for healthy development.

Our school curriculum is bespoke and designed to meet the needs of the children in our school. It is underpinned by the Quantock Education Trust curriculum principles (SMART) which guide the development and review of the curriculum in all schools in the Trust:

- A strong and carefully Sequenced curriculum, so that children and young people's learning progresses in a way that builds knowledge intentionally and cumulatively
- A curriculum that Motivates children and young people so they can value and experience joy in learning whilst developing their own unique voice.
- An Ambitious curriculum, so that children and young people are challenged and empowered to think deeply and critically and grapple with complexity, challenge assumptions, question accepted authorities and embrace curiosity.
- A curriculum that is Responsive, so that it meets the needs of children and young people in our local community as well as opening doors to the wider world.
- A curriculum that is Transformative, so that children and young people can put their learning to use as active citizens, working for social justice, environmental stewardship and a healthy, equitable world, enabling them to build character and shape their future.

Implementation

At Spaxton we use enquiry-based learning to develop pupils' scientific knowledge. Sessions mostly begin with a question to promote scientific thinking and allows pupils to apply prior knowledge. Across the year, pupils have opportunities to develop skills in the following areas:

- Asking questions
- Observing and measuring
- Planning and setting up different types of enquiry
- Identifying and classifying
- Performing tests
- Gathering and recording data
- Reporting, presenting and communicating data/findings
- Using equipment

When planning, teachers use a range of resources alongside the programmes of study in the National Curriculum which include (but is not limited to): STEM learning, Tig-Tag Junior, BBC bitesize, Tom Robson

All staff use high-quality teaching and make use of explicit instruction, cognitive and metacognitive strategies, scaffolding, flexible grouping and technology to ensure a supportive environment for all pupils, without exception.

At the start of each unit, teachers use a range of assessment techniques to ascertain pupils' current attainment and skill level, and adapt planning where necessary. This continues throughout the unit, including addressing any identified misconceptions or misuse of vocabulary. At the end of the unit, teachers assess current skill and knowledge to inform future planning.

Curriculum Overview

At Spaxton our Science overview in based on a rolling programme this ensures that all students cover the curriculum over a two- or three-year cycle, in mixed-age classes. It guarantees that no student misses essential content regardless of their starting point in the cycle.

Yr R/1/2	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
A	Weather and seasons Penguins – living things		Dinosaurs – Fossils/rocks Space		Minibeasts Weather around the world	
B	Seasonal changes Hibernation Forces		Materials – building a boat Human body and animals		African animals – characteristics lions Plants	
C	Weather and Seasonal Change – trees Materials and their properties		Forces British Animals/ living things		Plants Habitats	

Yr 3/4	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
A	Forces and magnets		Food and digestion Classifying living things and their habitats		Helping plants grow well What makes us	
B	States of matter Rocks		Sound Light Electricity		Life cycles Changes to our body	

Yr 5/6	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
A	Earth and space		Electricity Light		The human life cycle Studying living things	
B	Properties of materials Changes of state		Evolution and inheritance Forces		The heart and health Blood and transportation	

Our small step progression allows for focused attention on a single concept or skill at a time. This approach aligns with cognitive science principles, such as the **"chunking" method**, which helps the brain process and retain information more effectively. Learners can fully grasp one concept or skill before moving on to the next, avoiding gaps in knowledge.

Science – EYS and KS1

PHASE	Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and properties	Seasonal Changes
Rec/ Y1/Y2	A	Ask questions Collect data Observe Notice patterns Record findings **Possible investigations** **Sorting keys/hoops for different animals (minibeasts)** **Which material is best for … (an umbrella) materials**	**My brilliant body (to include RSHE)** • Recognise and compare main external parts of the human body • Describe other animals and what they look like • Importance of hygiene, washing hands, cleaning teeth, showering	**Marvellous minibeasts** • Sort animals on observed characteristics • Explain difference between animals including fins, arms, skin, feathers, scales etc… • Know that some animals are carnivores/herbivores and omnivores • Identify that most living things have habitat • Explore simple food chains and interdependence within a habitat	**Introduction to Plants** • Identify and name a variety of common plants and trees • Identify and describe the basic structure of a flowering plant and tree	**Exploring uses everyday materials** • Know the difference between an object and its material • Name a variety of materials • Describe simple physical properties of everyday materials • Compare and group everyday materials based on simple physical properties • Explore suitability of everyday materials use particular uses • Find out how the shapes of solid objects can be changed	
	B	Ask questions Collect data Observe Notice patterns Record findings **Possible investigations** **Weather diaries (weather and seasons)**	**Growth** • Understand animals have offspring that grow into adults • Compare differences between animals and how they grow • Explore simple life cycle of a human (baby/toddler/child /adolescent/adult) **Diet and health** • Explore basic needs of animals for			**Forces and fun (machines/toys)** • To compare how different thing move • Notice and describe how things are moving, slowly, quickly • Sort objects (toys) according to how they move • Identify pushes ,pulls and twists • Identify pushes and pulls in the classroom	**Weather and seasons** • Observe changes across the four seasons • Observe and describe weather associated with the seasons • Observe and describe how day length varies

		Changes in shape of dough, when dropping it (forces)	survival (water, food, air) • Importance of exercise for health • To begin to know which foods are good for us and what can make us unwell • Understand how medicine can make is better				
	C	Ask questions Collect data Observe Notice patterns Record findings **Possible Investigations** **Collecting – totally natural** **Observation – Let it grow**	**Senses** • Identify, name and draw basic body parts associated with each of our senses • Explore sense of smell, taste, touch, sight and hearing	**Animals** • Identify differences between what is alive, dead and never been alive • Explore habitats, discussing adaptations can a polar bear live in a forest?	**Growth and care** • Observe and describe how seeds and bulbs grow into mature plants • Explore the importance of water, light and temperature for plants to grow and stay healthy.		

Science – KS2 lower

PHASE	Cycle Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and properties	States of matter	Electricity
3/4	A	Ask questions Collect data Observe Notice patterns Record findings **Possible investigations** **What happens if a plant has no leaves?**	**Life cycles (to include RSHE)** • Identify what a life cycle is • Explore life cycle of plant • Explore life cycle of frog/butterfly looking at metamorphosis		**Helping plants grow well** • Explore what green plants need to stay alive • Study the importance of leaves	**Forces and magnets** • Compare how things move on different surfaces (friction)		

		What happens to our teeth if they are not cleaned? (eggs different drinks) **Celery in food colouring to explore how water moves around a plant (plants)**	• Explore how humans change over their life time • How do animals reproduce including egg laying, live birth and metamorphosis **Food and digestion and Bones – How do we move? Teeth** • Identify that humans and some animals have skeletons and muscles for support, protection and movement • Identify animals, including humans need the right types of nutrition • That they can't make their own food and get nutrition from what they eat • Describe simple functions of digestive system • Identify different types of teeth in humans and their functions.		• Study importance of roots (how water is transported) • To name parts of the flower and what they do • Explore germination/ pollination/seed dispersal	• Explore floating and sinking • Observe how magnets attract and repel • Describe poles in terms of magnets		
	B	Ask questions Collect data Observe Notice patterns Record findings **Possible investigations** **Find patterns in how shadows can change/plot movement throughout the day (light)** **Create own water cycles (solids, liquids and gasses)**		**Classifying living things and their habitats (to include RSHE)** • Construct and interpret a variety of food chains, identifying producers, consumers, predators and prey • Understand how to group living things and identify them using classification keys • Recognise how changes in the		**Rocks and soils** • Compare and group different kinds of rocks (sedimentary, metamorphic and igneous) • Describe how fossils are formed • Recognise that soils are made	**Solids, liquids and gases** • Compare and group materials together, according to their state • Observe changes of state due to heating and cooling • Understand the impact of temperature in the water cycle	**Electricity** • Identify appliances that run on electricity • Construct simple series electrical circuits, identifying and naming parts • Identify if a circuit would allow electricity to flow • To understand and recognise common

		Creating complete circuits investigating materials that are conductors or insulators (electricity)		environment affect living things		from rocks and organic matter **Light and sound** • Recognise that light is needed to see things • To understand that light is reflected from surfaces • Know that shadows form when light is blocked • Recognise that light from sun is dangerous and we must protect our eyes • Identify how sound is made • Understand how sound travels (waves)		conductors and insulators

Science – KS2 upper

PHASE	Cycle Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and their properties	Earth and space	Electricity
5/6	**A**	Ask questions Collect data Observe Notice patterns Record findings **Possible investigations**	**Human life cycles (to include RSHE)** • Describe changes as humans develop to old age • Describe the life processes of reproduction in	• Describe the differences in life cycles between mammal, amphibian, insect and bird • Explore habitat destruction and its impact on animals	• Describe the ways in which nutrients and water are transported within plants • Explore habitat destruction and its impact on plants	**Light** • Recognise that light appears to travel in straight lines • Use this idea to link to how we see by reflection	• Describe the sun, Earth and moon as spherical bodies	• Compare and give reasons for variations in how components function, including

		Moon dairy **Total eclipse of my lid** **Candle with care**	some plants and animals	• Describe how living things are classified into groups according to common observable characteristics, including micro-organisms • Give reasons for classifying animals	• Describe how living things are classified into groups according to common observable characteristics, including plants • Give reasons for classifying plants	• To know that shadows are the same shape as the objects that cast them • Explain that light travels from a source, to our eyes or from a source to an object and then to our eyes • To recognise the differences between transparent, opaque and translucent	• Describe the movements of the Moon relative to Earth. • Describe the movement of Earth and other planets relative to the sun. • Explain day and night	brightness of bulbs, the loudness of buzzers • Discuss voltage and cells • Use recognised symbols when drawing circuit diagrams
	B	Ask questions Collect data Observe Notice patterns Record findings **Possible investigation** **Filtering mixtures coffee, sugar, water** **Sand, mud, water** **Utterly gene-ius**	**Heart and Health, Blood and transportation** • Identify and name the main parts of the human circulatory • 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 **Evolution and inheritance** • Recognise that living things have changed over time • Fossils provide information about living things millions of years ago • Recognise that living things produce offspring of the same kind • Adaptations lead to evolution		• Identify how plants are pasted to suit their environment in different ways	**Forces** • Explain the force of gravity and impact on a falling object • Identify effects of air resistance, water resistance and friction • Recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect **Materials and change** • Compare and group everyday materials on the basis of their properties (hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets • Give reasons based on		

						evidence from comparative and fair tests for particular uses of materials, including metal, wood and plastic • Understand that some materials are soluble and recover a substance from a solution • Using knowledge of solids , liquids and gases to decide how mixtures can be separated. Using sieving, filtering, evaporating • Demonstrate reversible changes and explain that some changes are irreversible		

Impact and Assessment

We assess pupils as we observe them during lessons and mark their work following this, annotating with appropriate comments, if necessary. Science skills and learning can be enhanced through effective verbal and written questions.

At the beginning of each unit, prior learning is explored through a variety of means such as; retrieval, pre-assessment 'brain dumps', use of KWL grids or quizzes.

Each class has impact tasks at the end of a unit to support the teachers' assessments, book looks, observations of science lessons, pupil voice and the end of year teacher assessments all contribute to the overall assessment of Science.

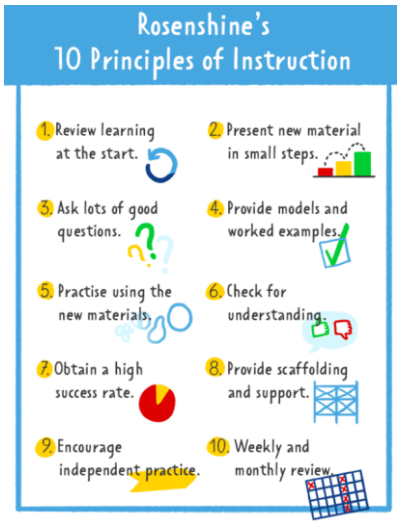
Inclusion

At Spaxton we believe that **All** leaders are leaders of SEND, and as such is it our responsibility to ensure an inclusive approach to promote the wellbeing and academic progress of **all** our children in whole curriculum. By removing barriers to learning and supporting the growth of the whole child we are helping **all** to succeed.

In the Trust, we have adopted an evidence-based approach to supporting **all** of our children as we believe what is good for all can be vital for some.

We use the EEF 'Five a day' principles to support our repertoire of teaching strategies daily in response to individual needs.

These work in conjunction with the work we have been doing on Retrieval with Kate Jones and Rosenshine's Principles of instruction such as small step learning, modelled examples, independent practice.



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