

Intent

'Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.'

The Science Council

Science is a body of knowledge, encompassing the specific disciplines of biology, physics and chemistry, which is built up through experimental testing of ideas. Science is also a methodology, a practical way of finding reliable answers to questions we may ask about the world around us.

We believe that science is inclusive and fosters curiosity in all children.

In order to achieve this at Bramley C of E (VA) Infant and Nursery we intend to:

- encourage and develop a positive attitude to science
- develop social skills to enable children to work cooperatively with others
- develop knowledge and understanding whilst encouraging the development of key scientific skills.
- deliver curriculum objectives through hands on, practical lessons with 'working scientifically' at its core
- develop a natural curiosity through opportunities to observe the world around us as well as through the use of quality footage for things we cannot observe first hand
- offer meaningful opportunities to develop understanding of different scientific ideas by using different types of scientific enquiry to answer their own questions.
- introduce high level vocabulary that is suitable yet challenging for our children and expect all of our children to be able to use the correct vocabulary for each topic, remembering it long after the topic is over.
- encourage the children to develop their curiosity by encouraging them to ask questions about what they notice, express their opinions and make links with other areas of learning such as Geography and Maths.
- build happy scientists who leave our school ready to take on their next challenge in year 3.

Implementation

Staff subject knowledge allows the intentions of our science curriculum to be delivered successfully. We continually strive to build upon the excellent understanding of the expectations of the curriculum that our staff have. We achieve this through regular quality CPD which is provided through the subject leader, external courses and collaborative lesson study. All staff are encouraged to raise questions, seek support and request further training if needed in order to ensure everyone is confident in what they teach. Good practice is always shared between staff and all CPD is used to inform teaching and learning across the school. Resources and equipment are audited regularly so that children have materials of high quality and accuracy to support their learning. Each class has access to science resources which are familiar to the children and they can access them independently when needed. Curriculum maps are based on topics using Birth to % matters, the Early Learning Framework and the National Curriculum Programmes of Study. To ensure that our offer is rich and varied, resources are hand-picked from other sources. These include concept cartoons, Twinkl, Hamilton, Animal Kind, Explorify and are used across EYFS and KS1 allowing children to be exposed to a variety of different types of learning and to ensure coverage in different formats. Formative pre and post unit assessments are used where appropriate which help teachers to gather an understanding of their pupil's existing and developing knowledge and skills. Correct scientific vocabulary is used by all staff and this is discussed with and explained to children who are then encouraged to use it independently when talking about science. Vocabulary is taught directly and is referred to in every lesson. Learning will be adapted for children with SEND. Deep learning is developed through repeating, reinforcing and revising key skills and vocabulary. Feedback is given in a variety of ways to ensure pupils are well informed and making visible progress. Discussion is essential to learning and children are encouraged to discuss their thoughts, ideas and methods with a partner, group or the teaching staff. Task types are varied to suit different pupils and their learning preferences. Tasks are designed to allow pupils to follow lines of enquiry and develop concepts, making predictions and discussing outcomes. Children have opportunities to work both collaboratively and independently. Where appropriate longer studies will be used to support understanding of the world around us, for example looking at seasonal changes.

In EYFS science is planned for each half term and occurs throughout the day by nurturing the children's wonder and curiosity about the world around us. In KS1 science is taught weekly allowing children to develop their knowledge and skills effectively whilst also maintaining knowledge from previous learning. At the beginning of each KS1 science lesson, previous knowledge and vocabulary is rehearsed through games and quick activities. This is also displayed on working walls for the children to access at all times. Children record their learning in their personal science books as well as class books which show aspects of science lessons or units that are not required to be recorded individually such as; pictures of enquiries, thought showers, comments from discussions, etc.

Impact

As a result of our teaching at Bramley Infant and Nursery school you will see:

- Children who are curious and able to explore their environment
- Children who are able to 'have a go' and apply their learning in different contexts
- Children who can reason about their understanding making links to prior knowledge
- Children who have a richer vocabulary which will enable them to articulate their understanding of taught concepts
- Children who have gained a wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry skills
- Children who have made outstanding progress over time and reached at least age-related expectations.
- Children who understand that science has changed our lives.
- Children who enjoy being 'scientists'
- Children who are prepared for life in an increasingly scientific and technical world
- Children who foster a concern about, and active care for, our environment
- Children who are developing an understanding of the international and collaborative nature of science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	<p>Autumn Begin to observe objects such as plants, animals, natural and found objects</p>	<p>Light and Dark Has a sense of own immediate family and relations and pets</p> <p>Begin to use everyday materials to explore, understand and represent their world- their ideas, interests and fascinations</p>	<p>Nursery Rhymes Begin to learn they have similarities and differences that connect them to, and distinguish them from, others</p>	<p>New Life Observe objects such as plants, animals, natural and found objects</p> <p>Operates mechanical toys, e.g. turns the knob on a windup toy or pulls back friction car</p> <p>Uses everyday materials to explore, understand and represent their world- their ideas, interests and fascinations</p>	<p>Friends and Family Enjoys playing with small world reconstructions, building on first-hand experience, e.g. visiting farms, garages, train tracks, walking by river or lake</p>	<p>Courage Learns that they have similarities and differences that connect them to, and distinguishes them from others</p> <p>Uses everyday materials to explore, understand and represent their world- their ideas, interests and fascinations</p>
	<p>Working Scientifically linked to Birth to 5 Matters - Range 4 Notices detailed features of objects in their environment (UTW-TW) Can talk about some of the things they have observed such as plants, animals, natural and found objects (UTW-TW) Understands who, what, where in simple questions (e.g. Who's that? Who can? What's that? Where is?) C&L-U) Uses a variety of questions (e.g. what, where, who) (C&L-S) Learns that they have similarities and differences that connect them to, and distinguish them from, others (UTW-P&C)</p>					
Pre-School	<p>All About Me Talks about their family, friends and where they live.</p> <p>Name and identify different parts of the body</p> <p>Begins to notice similarities and differences</p> <p>Observes what makes them unique.</p> <p>Creates a self-portrait by looking closely at themselves using mirrors.</p> <p>Talks about eye, skin and hair colour and selects appropriate colours.</p> <p>Begins to understand growth and changes over time.</p> <p>Looks at photographs of themselves as a younger child and observes how they have changed.</p>	<p>Autumn Comments and ask questions about aspects of their familiar world.</p> <p>Begins to understand growth and changes over time.</p> <p>Observes things in the natural world. Explores the school outside area and notices what is happening to the plants and trees.</p> <p>Uses stories and non-fiction books to explore changes in the natural world during Autumn and in to Winter.</p>	<p>Traditional Tales / Winter / Superheroes Developing an understanding of growth, decay and changes over time.</p> <p>Observes our school outside area and comments on how aspects of our natural world have changed since last term.</p> <p>Talks about why things happen and how things work.</p> <p>Plays with a range of materials that Superheroes may use to learn cause and effect.</p> <p>Creates their own Superhero objects using a range of different materials.</p>	<p>Under the Sea / Spring Developing an understanding of growth, decay and changes over time.</p> <p>Explores our outside area to look for examples of new life.</p> <p>Uses stories and non-fiction books to explore what happens to our local natural world in the Spring. Talks about why things happen and how things work.</p> <p>Uses stories and non-fiction books to explore sea creatures and the environment that they live in.</p>	<p>The Great Outdoors / Farms and Farm Animals Shows care and concern for living things and the environment.</p> <p>Begins to understand the effect their behaviour can have on the environment.</p> <p>Uses stories and non-fiction books to explore living things and the environment that they live in.</p> <p>Developing an understanding of growth, decay and changes over time.</p>	<p>Minibeasts Shows care and concern for living things and the environment.</p> <p>Investigates our environment to explore minibeasts and their natural habitat.</p> <p>Uses child appropriate magnifying glasses to observe closely and talk about what they have seen.</p>
	<p>Working Scientifically linked to Birth to 5 Matters - Range 5 Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world (UTW-TW) Talks about why things happen and how things work (UTW-TW) Beginning to understand why and how questions (C&L-U) Uses talk to explain what is happening and anticipate what might happen next • Questions why things happen and gives explanations. Asks e.g. who, what, when, how (C&L-S) Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family (UTWOP&C)</p>					

Reception

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<p>Autumn-seasonal change. Developing familiarity with their immediate environment and its objects, materials and living things.</p> <p>Begins to make closer observations and identify similarities and differences between objects, materials and living things (including themselves). Begins to record their observations using drawings and photographs.</p> <p>Notices changes over time throughout the autumn season and beginning to be able to explain why some things occur and talk about changes.</p> <p>Makes links with what they have learned about Harvest. Some of the aspects of seasonal change that will be covered include deciduous trees losing their leaves, the production of seeds, the behaviour of squirrels and spiders as well as the migration of birds.</p>	<p>Autumn into Winter Notices changes including colder weather, ice (freezing and melting), lack of leaves on deciduous trees, shorter daylight hours.</p> <p>Light and dark investigates and compares objects that produce and reflect light as well as materials that light can pass through.</p> <p>Experiments to see what happens when light is blocked.</p> <p>Begins to explain why some things occur, such as how a shadow is formed. Using stories and non-fiction texts learn about nocturnal animals and where different wild animals live e.g. underground or in trees.</p>	<p>Winter Makes observations of what happens to plants and animals in the winter</p> <p>Considers how can we look after plants</p> <p>Materials (Link to Literacy-Traditional tales) Compares suitability of different materials for making a bed, house and bridge linked to the stories of Goldilocks and the Three Bears, The Three Little Pigs and The Three Billy Goats Gruff respectively)</p>	<p>Spring Makes more detailed observations of change in living things as winter turns to spring.</p> <p>Notices new growth and talks about what is needed for growth in plants to occur.</p> <p>To make observations of animals Understands that tadpoles grow into frogs, caterpillars grow into butterflies and babies grow into children and then adults.</p> <p>Draws pictures of animals and plants in order to record what they have learned/observed.</p>	<p>Living things Begins to learn about how different living things can be found in different environments and why they are suited to a particular environment. (Link to Geography and Literacy. Building upon learning in the Spring Term about different environments)</p>	<p>Health and self-care Eats a healthy range of foodstuffs and understands need for variety in food.</p> <p>Describes physical changes to the body that can occur when feeling unwell, anxious, tired, angry or sad.</p> <p>Has established consistent, daily pattern in relation to eating, toileting and sleeping routines and can explain why this is important.</p> <p>Shows some understanding that good practises with regard to exercise, eating, drinking water, sleeping and hygiene can contribute to good health.</p>
	<p>Working Scientifically linked to Birth to 5 Matters - The World Range 6 and ELG Looks closely at similarities, differences, patterns and change in nature (UTW-TW) Knows about similarities and differences in relation to places, objects, materials and living things (UTW-TW) Makes observations of animals and plants and explains why some things occur, and talks about changes (UTW-TW) Understands questions such as who; why; when; where and how (C&L-U) Knows about similarities and differences between themselves and others (UTW-P&C)</p> <p>ELG Explore the natural world around them, making observations and drawing pictures of animals and plants (TNW) 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 (TNW)</p> <p>ELG Make comments about what they have heard and ask questions to clarify their understanding (L, A &U)</p>					

Year One

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<p>Animals, including humans Names each sense Identifies parts of the body associated with each sense</p> <p>Identifies, names and draws the basic parts of the human body</p> <p>Explores their environment using the senses</p> <p>Identifies and names some common animals</p> <p>Begins to name some animal groups, (mammals, reptiles, birds, fish, amphibians)</p> <p>Begins to describe and compare the structure of common animals</p> <p>Famous scientist - Charles Darwin (History link)</p>	<p>Seasonal changes Discusses change of day length Makes observations of deciduous and evergreen trees Makes close observations of autumn leaves Observes and comments on a class enquiry over time using leaves Leaf observations Makes observations and describes the weather during an autumn week</p> <p>Animals, including humans Identifies and names a variety of common animals that are carnivores, herbivores and omnivores</p>	<p>Seasonal changes Begins to link events, months with seasons (to include: deciduous trees, hibernating animals, birthdays, celebrations)</p> <p>Identifies some common winter garden birds (RSPB Big Schools' Birdwatch – citizen science)</p> <p>Identifies and names a few common birds that are carnivores, herbivores and omnivores</p> <p>Everyday materials Identifies and names a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Distinguishes between an object and the material from which it is made Describes the simple physical properties of a variety of everyday materials</p> <p>Compares and groups together a variety of everyday materials on the basis of their simple physical properties</p> <p>Names materials used inside school and in the school grounds</p> <p>Considers suitability of materials linked to their simple physical properties</p>	<p>Everyday materials Investigates materials by comparing and observing</p> <p>Investigating materials – observing which materials float and sink -observing which materials are absorbent</p> <p>Material hunt – identifying, classifying</p> <p>Seasonal changes Looks for evidence of spring growth</p> <p>Makes observations and describes the weather during a winter week</p> <p>Makes comparisons with the autumn and winter weather observations</p>	<p>Plants Identifies and describes the basic structure of a variety of common flowering plants, including trees.</p> <p>Knows that flowering plants produce seeds</p> <p>Considers the needs of a seed to germinate</p> <p>Helps to nurture seedlings and plants</p> <p>Animals, including humans Consider where different animals live (school grounds, woods, ponds)</p> <p>Identifies and names a variety of common animals including fish, amphibians, reptiles, birds and mammals (use of school pond)</p> <p>Groups animals according to their diet</p>	<p>Plants Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Uses leaf shape to help identify trees in school grounds</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p> <p>Harvests potatoes. Identifies and names the parts of the plant</p> <p>Plants class raised bed</p> <p>Animals, including humans Identifies and names a greater variety of common animals, making connections between structure and diet of other known animals</p> <p>Raise and release butterflies. Learns about life cycle, role and structure of butterflies</p>
	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ asking simple questions and recognising that they can be answered in different ways ➤ observing closely, using simple equipment ➤ identifying and classifying ➤ using their observations and ideas to suggest answers to questions 	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ 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. 	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ asking simple questions and recognising that they can be answered in different ways ➤ observing closely, using simple equipment ➤ identifying and classifying ➤ using their observations and ideas to suggest answers to questions ➤ gathering and recording data to help in answering questions. 	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ 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. 	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ asking simple questions and recognising that they can be answered in different ways ➤ observing closely, using simple equipment ➤ identifying and classifying ➤ using their observations and ideas to suggest answers to questions ➤ gathering and recording data to help in answering questions. 	<p>Working Scientifically</p> <ul style="list-style-type: none"> ➤ asking simple questions and recognising that they can be answered in different ways ➤ observing closely, using simple equipment ➤ identifying and classifying ➤ using their observations and ideas to suggest answers to questions ➤ gathering and recording data to help in answering questions.

Year Two

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<p>Uses of everyday materials Identifies and compares the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Finds out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Uses of everyday materials Identifies and compares the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p>	<p>Animals, including humans Notifies that animals, including humans, have offspring which grow into adults. Finds out about and describes the basic needs of animals, including humans, for survival (water, food and air). Describes the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Plants Observes and describe how seeds and bulbs grow into mature plants</p> <p>Finds out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Living things and their habitats Explores and compares the differences between things that are living, dead, and things that have never been alive.</p> <p>Identifies 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.</p> <p>Identifies and names a variety of plants and animals in their habitats, including micro – habitats.</p> <p>Describes 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.</p>	<p>Living things and their habitats Identifies that most living things live in habitats to which they are suited and describes how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>Describes 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</p>
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National Science Week in March. The subject leader informs each class teacher of the theme (which changes annually) and provides activity suggestions. The focus may be for one lesson or more dependent on each class teacher's planning.

For key vocabulary and resources see individual Learning Journey documents.