

Bream C of E Primary School

*'Be the best you can be; together we grow from acorns
to oaks flourishing in God's love'*

Science Curriculum Skills Progression Document

Trust, Friendship, Respect, Forgiveness, Courage, Truthfulness

Intent

At Bream C of E Primary School, our intention is to provide a high quality, broad and balanced science education that enables all children to think confidently like a scientist and gain age appropriate knowledge, skills and understanding of science. We will ensure children are exposed to high quality science teaching that provides children with the foundations they need to recognise science in everyday life, become inquisitive learners and ask questions about the world around them. We will provide high quality learning opportunities for all children to take part in research, investigations and evaluation about their own experiences.

The intention of our teaching of Science is to be fully inclusive and support all of our pupils, no matter what the needs. This will be carried out through high-quality teaching, explicit instruction, flexible grouping, scaffolding, modelling, catch up intervention and use of graphic organisers. We want our children to become confident and enthusiastic, scientists who are curious and ask questions about their natural world.

Implementation

- Bream C of E Primary School provides children with an exciting and engaging experience of science, allowing them to link this to the real world.
- Our long-term planning sets out the Science units, which are to be taught throughout the year, and ensures that the requirements of the National Curriculum are fully met. Teachers will cover a new science unit every half term.
- Children participate in high quality, engaging Science lessons each week, where they develop their scientific enquiry skills to investigate analyses and evaluate all areas of science.
- Children will carry out practical investigations to develop a deeper understanding of the science they are learning about.
- Children will build upon their learning from previous year groups, developing a deeper understanding and progressions of science skills.
- Children will explore, question, predict, plan, carry out investigations and observations, as well as conclude their findings. These will be presented using science specific language, observations and diagrams.
- Staff will use Insight tracker to assess children's learning, and to provide data that will inform future practice.

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- Staff will use our Rosenshine principles to ensure inclusive teaching and practice for all through a range of ways: high quality teaching, scaffolding and modelling, and flexible groupings.

Impact

The impact of this curriculum design will lead to outstanding progress over time, across key stages, relative to a child's individual starting point and their progression of skills. Children will therefore be expected to leave Bream C of E reaching at least age related expectations for Science. Through various workshops, trips and interactions with experts, our Science curriculum will lead pupils to be enthusiastic Science learners, understand that science has changed our lives and that it is vital to the world's future prosperity. We want to empower our children so they understand they have the capability to change the world. This is evidenced in a range of ways, including pupil voice, their work and their overwhelming enjoyment for science.

Through our inclusive teaching approach, all our learner's will have access to an engaging science curriculum, and have a wider understanding of its value within the wider world.

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Primary Science Education

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

Key Stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific, methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognizing that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using the observations and ideas to suggest answers to questions

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- gathering and recording data to help in answering questions

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year R	Science in early years is covered through Understanding the World ELG. Pupils should learn about: 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.					
Year 1	Seasonal changes Pupils should be taught to: > Observe changes across the four seasons > Observe and describe weather associated with the seasons and how day length varies	Everyday materials Pupils should be taught to: > 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	Animals including humans Pupils should be taught to: > 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	Plants Pupils should be taught to: > 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	Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.	

		> compare and group together a variety of everyday materials on the basis of their simple physical properties				
Year 2	Living things and habits (habitats) Pupils should be taught to: > 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	Living things and habitats (microhabitats) Pupils should be taught to: > 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 and microhabitats	Everyday materials Pupils should be taught to: > Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for practical uses > Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Animals including humans Pupils should be taught to: > 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 amount of different types of food, and hygiene	Plants Pupils should be taught to: > 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	Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

	habitats and microhabitats					
	> 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					

Key Stage 2

Lower Key stage 2

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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

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- 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
- 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.

Upper Key Stage 2

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Working scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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 and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

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- identifying scientific evidence that has been used to support or refute ideas or arguments

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	Term 1	Term 3	Term 3	Term 4	Term 5	Term 6
Year 3	Animals including humans Pupils should be taught to: > Identify that animals, including humans, need the right types and amounts of nutrition, and that they cannot make their own food; they get nutrition for what they eat > Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Forces and magnets Pupils should be taught to: > 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 based on the basis of whether they are attracted to a magnet, and identify some magnetic materials	Rocks and soils Pupils should be taught to: > 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 a rock > Recognise that soils are made from rocks and organic matter	Light Pupils should be taught to: > Recognise that they need light in order to see things and that dark in 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	Plants Pupils should be taught to: > 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 the 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	Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

		> Describe magnets as having two poles > Predict whether two magnets will attract or repel each other, depending on which poles are facing			formation and see dispersal	
Year 4	Animals including humans Pupils should be taught to: > Recognise that living things can be grouped in a variety of ways > Describe the simple functions of the basic parts of the digestive system in humans > Identify the different types of teeth in human and their simple functions > Construct and interpret a variety of food chains, identifying producers, predators and prey	Electricity Pupils should be taught to: > 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	States of matter Pupils should be taught to: > 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 > Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Sound Pupils should be taught to: > 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	Living things and habitats Pupils should be taught to: > 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 > Construct and interpret a variety of food chains, identifying	Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

		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		> Recognise that sounds get fainter as the distance from the sound source increases	producers, predators and prey	
Year 5	Properties and changes of materials (mixture and separation) Pupils should be taught to: > 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	Properties and changes of materials Pupils should be taught to: > 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 > Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including	Earth and space Pupils should be taught to: > 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	Living things and habitats Pupils should be taught to: > Describe the differences in the life cycles of a mammal, amphibian, an insect and a bird > Describe the life process of reproduction in some plants and animals	Forces and magnets Pupils should be taught to: > 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 lever, pulleys and gears, allow a smaller	Animals including humans Pupils should be taught to: > Describe the differences in the life cycles of a mammal, amphibian, an insect and a bird > Describe the life process of reproduction in some plants and animals Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections

	> Demonstrate that dissolving, mixing and changes of state are reversible changes	metals, wood and plastic > 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	of the sun across the sky > Explain that unsupported objects fall towards the Earth because of the force of gravity activity between the Earth and the falling object		force to have a greater effect	between the key concepts and skills.
Year 6	Living things and habits Pupils should be taught to: > Describe how living things and classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals > Give reasons for classifying plants and animals based	Light Pupils should be taught to: > Recognise that light appears to travel in straight lines > Use the idea that light travels in straight lines to explain the objects are seen because the 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	Evolution and inheritance Pupils should be taught to: > 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	Electricity Pupils should be taught to: > 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 reason for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	Animals including humans Pupils should be taught to: > 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 > Identify how animals and plants	Making connections This unit will bring together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

	on specific characteristics	and then to our eyes. > Use the idea the light travels in straight lines to explain why shadows have the same shape as the objects that cast them	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	> Use recognised symbols when representing a simple circuit in a diagram	are adapted to suit their environment in different ways and that adaptation may lead to evolution	
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