Bishop Cornish CE VA Primary School
Science
Progression Map

Intent

At Bishop Cornish we pride ourselves in planning and delivering a broad and balanced curriculum, ensuring that its delivery is exciting, interactive and enables children to 'build memories.' It is bespoke to the needs of the children, not only by focusing on appropriate subject specific knowledge, skills and understanding as set out in the National Curriculum, but by developing individual and collaborative learning experiences, a positive growth mind set, a sense of responsibility and challenges that take them beyond the classroom and promote a life-long love of learning. We are fortunate that our learning environment allows us to use the outdoors as much as possible and this enhances the children's experiences. Outdoor learning is integral to all subjects – core and foundation. Creative ways are found by the teaching staff to design active opportunities to learn. Our Curriculum has been planned to ensure each and every child can 'live life in all its fullness' by offering stimulating and awe-inspiring learning experiences with Christian values at its heart.

Ultimately our curriculum is intended to:

- Develop our head and body: What we learn
- Develop our hearts and character: Who we are
- Develop our actions and attitudes: How we live and learn
- Develop our moral compass: Where we fit in the world.

As educators, we understand the importance of mental health, and aim to create emotionally sound, resilient and well-regulated children. Our curriculum aims to do this using the model of 'PLACE' –being Playful, Loving, Accepting, Curious and Empathic. This way of thinking, feeling, communicating and behaving aims to make each child feel safe and happy, enabling them not only to learn, but to develop a love of learning.

We set the highest standards of attainment for all our children. We also value the breadth of the curriculum that we provide. We foster creativity in our children, and to help them become independent learners. Above all we believe in making learning enjoyable, motivating, fun and purposeful!

Level Expected at the End of EYFS

We have selected the Early Learning Goals that link most closely to the Science National Curriculum.

ELG: The Natural World Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; - We learn about the seasons and how they change, learn about baby animals and ourselves as babies and how we grown and change. We have a topic of mini beasts and learn about caterpillars. We also watch what happens to trees during different seasons. The children look at each season and talk about how they differ and what changes in each one e.g. weather and temperature.

- 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- so this is new I think to the curriculum so I am going to look in to it a bit more. Environments around the world will have links to geography.

Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter- floating and sinking and how liquids turn in to solids via freezing.

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for subject 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 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations	
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:	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:	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:
Working scientifically (Y1 & 2) • 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.	**Working scientifically (Y3 & 4)** • 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	**Working scientifically (Y5 & 6)** • 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

	• 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.	• reporting and presenting findings from enquiries, including conclusions, causal relationships 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.
Plants (Y1) • 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. **Plants (Y2)** • 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.	**Plants (Y3)** • 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 (Y5)** • 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. **Living things and their habitats (Y6)** • describe how living things are 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 on specific characteristics.
Animals, including humans (Y1) • 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.	**Animals, including humans (Y3)** • 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	**Animals, including humans (Y5)** • describe the changes as humans develop to old age.
Animals, including humans (Y2) • 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.	**Animals including humans (Y4)** • describe the simple functions of the basic parts of the digestive system in humans • 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.	**Animals, including humans (Y6)** • 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 • describe the ways in which nutrients and water are transported within animals, including humans.

Living things and their habitats (Y2)

- 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 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.

Everyday materials (Y1)

- 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.

Living things and their habitats (Y4)

- 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.

Rocks (Y3)

- 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.

Evolution and inheritance (Y6)

- 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.

Properties and changes of materials (Y5)

- 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

Use of everyday materials (Y2)

- 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.

Seasonal changes (Y1)

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

States of matter (Y4)

- 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.

Light (Y3)

- 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

- 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.

Earth and space (Y5)

- 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.

Light (Y6)

- 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

	• 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. **Sound (Y4)** • 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. **Forces and magnets (Y3)** • 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	• 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 (Y5)** • 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

	• 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. **Electricity (Y4)** • 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.	• recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Electricity (Y6)** • 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.

Concepts	KS1	KS2
Working Scientifically	Across all year groups scientific knowledge and skills should be learned by working scientifically. (This is documented in the Essentials for progress section.)	
Biology	**Plants** • Identify, classify and describe their basic structure. • Observe and describe growth and conditions for growth. **Habitats** • Look at the suitability of environments and at food chains. **Animals and humans** • Identify, classify and observe. • Look at growth, basic needs, exercise, food and hygiene. ***All living things**** • *Investigate differences.*	**Plants** • Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal. Evolution and inheritance • Look at resemblance in offspring. • Look at changes in animals over time. • Look at adaptation to environments. • Look at differences in offspring. • Look at adaptation and evolution. • Look at changes to the human skeleton over time. **Animals and humans** • Look at nutrition, transportation of water and nutrients in the body, and the muscle and skeleton system of humans and animals. • Look at the digestive system in humans. • Look at teeth. • Look at the human circulatory system. **All living things** • Identify and name plants and animals • Look at classification keys. • Look at the life cycle of animals and plants. • Look at classification of plants, animals and micro-organisms. • Look at reproduction in plants and animals, and human growth and changes. • Look at the effect of diet, exercise and drugs.

Chemistry	**Materials** • Identify, name, describe, classify, compare properties and changes. • Look at the practical uses of everyday materials.	**Rocks and fossils** • Compare and group rocks and describe the formation of fossils. **States of matter** • Look at solids, liquids and gases, changes of state, evaporation, condensation and the water cycle. **Materials** • Examine the properties of materials using various tests. • Look at solubility and recovering dissolved substances. • Separate mixtures. • Examine changes to materials that create new materials that are usually not reversible.
Physics	***Light**** • *Look at sources and reflections.* ***Sound**** • *Look at sources.* ***Electricity**** • *Look at appliances and circuits.* **Forces** • Describe basic movements. **Earth and space** • Observe seasonal changes.	**Light** • Look at sources, seeing, reflections and shadows. • Explain how light appears to travel in straight lines and how this affects seeing and shadows. **Sound** • Look at sources, vibration, volume and pitch. **Electricity** • Look at appliances, circuits, lamps, switches, insulators and conductors. • Look at circuits, the effect of the voltage in cells and the resistance and conductivity of materials. **Forces and magnets** • Look at contact and distant forces, attraction and repulsion, comparing and grouping materials. • Look at poles, attraction and repulsion. • Look at the effect of gravity and drag forces. • Look at transference of forces in gears, pulleys, levers and springs. **Earth and space** • Look at the movement of the Earth and the Moon • Explain day and night

How we judge the children's attainment and progress in Science - this will inform the planning of learning experiences

Concept	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Working Scientifically *This concept involves learning the methodologies of the discipline of science.*	• Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• Ask relevant questions. Throughout lesson and through use of KWL grids. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes.	• Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.

		• Use straightforward, scientific evidence to answer questions or to support their findings.	