



Bishop Henderson Scientists

Knowledge and Skills Progression for Science

At Bishop Henderson Church of England Primary School, we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in primary schools, we give the teaching and learning of science the prominence it requires. The scientific area of learning is concerned with increasing children's knowledge and understanding of our world, and with developing skills associated with science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence. Alongside everything we do, we continually embed our values of kindness, dignity and endurance into the teaching of science.

<u>Strand</u>	<u>EYFS</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Working Scientifically (Raising questions and planning)	<p>Ask questions to find out more and to check they understand what had been said to them.</p> <p>Articulate their ideas, thoughts and intentions. <i>(Communication and language)</i></p>	<p>Ask simple questions</p> <p>Suggest simple ways of answering questions</p>	<p>Ask simple questions and know they can be answered in different ways</p>	<p>Ask relevant questions and start to know how to go about answering them</p> <p>Set up simple practical enquiries, and begin to use fair tests</p>	<p>Ask relevant questions and use different types of scientific enquiries to answer them</p> <p>Set up simple practical enquiries, comparative and fair tests</p>	<p>Plan different types of scientific enquiries to answer questions, including recognising variables</p>	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables</p>
Working Scientifically (Collecting and presenting data)	<p>Describe what they see, hear and feel whilst outside or in the classroom.</p> <p>ELG Explore the natural world around them, making observations and drawing pictures of animals and plants.</p>	<p>Use simple equipment to observe closely</p> <p>Performing simple tests</p> <p>Gather and record data</p>	<p>Observe closely using equipment – make observations over time</p> <p>Perform simple comparative tests</p> <p>Gather and record data to help in answering questions</p>	<p>Make systematic and careful observations and take measurements using standard units using a growing range of equipment</p> <p>Gather, record and present data in a variety of ways to help in answering questions</p> <p>Record findings using simple scientific language, drawings, bar charts, and tables</p>	<p>Make systematic and careful observations and take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions</p> <p>Record findings using simple scientific language, labelled diagrams,</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy.</p> <p>Know when necessary to take repeat readings</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>	<p>Take measurements, using an increasing range of scientific equipment, with precision, taking repeat readings when appropriate</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>

					keys, bar charts, and tables	bar and line graphs	
Working Scientifically (Drawing and evaluating conclusions)	ELG Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction texts, personal experiences and work covered in class. <i>(Communication and language)</i>	Use his/her observations and ideas to suggest Answers to questions Identify and classify Begin to notice and record similarities and differences	Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns Identify, group and classify	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions and suggest improvements Identify differences, similarities or changes	Report on findings from enquiries, using written explanations, presentations of results and conclusions Use results to draw conclusions, make predictions for new values, suggest improvements and raise further questions Use straightforward scientific evidence to answer questions or to support their findings.	Use test results to make predictions Report and present findings from enquiries, including conclusions Use oral and written forms of presentation of results	Use test results to set up further comparative and fair tests report and present findings from enquiries including causal relationships and explanations Use oral and written forms of presentation of results Identify scientific evidence that has been used to support or refute ideas or arguments
Biology							
Plants • Life processes • Structure and function	Explore the natural world around them. Describe what they see, hear and feel outside. ELG Explore the natural world around them, making observations and drawing pictures	Flowering plants have different parts – roots, stems, leaves, flowers, fruit,	To know that some things are living, some are dead and some have never been alive Plants need water, light and warmth	To stay healthy plants, need light, water, nutrients and room to grow Different parts of flowering plants have different functions Roots and stems – nutrition, transport of water and support Leaves – nutrition Flowers –reproduction		Plants need to reproduce	

	of animals and plants.						
Animals including humans <ul style="list-style-type: none"> • Life processes • Structure and function 	<p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Name and talk about members of their immediate and extended family.</p> <p>Identify, name and describe a variety of common animals including fish, amphibians, reptiles, birds and mammals, carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of common animals such as birds, fish, reptiles and pets</p> <p>Describe what is needed to stay healthy and clean.</p>	<p>Different animals need different types of food</p> <p>Animals, including humans, have different body parts ... and these have special functions to help them survive (Including senses)</p>	<p>Animals need water, food and air</p> <p>To stay healthy animals, need exercise, a balanced diet and hygiene</p>	<p>Animals cannot make their own food</p> <p>Many animals, including humans, have skeletons and muscles for support, protection and movement</p>	<p>Animals and humans have teeth to help them eat</p> <p>Food is broken down further in the stomach and intestine and absorbed into the blood stream with water</p>	<p>Animals need to reproduce</p>	<p>Some substances and lifestyle choices can have a negative impact on health</p> <p>Oxygen is taken into the blood in the lungs; the blood is pumped by the heart to take oxygen and nutrients to the muscles</p>

<p>Classification</p>	<p>Identify and talk about a range of common animals.</p> <p>Talk about similarities between animals and plants and where some animals and plants are found.</p> <p>Talk about what animals eat.</p>	<p>Plants are grouped into common wild and garden plants, deciduous and evergreen trees.</p> <p>Animals are grouped into fish, amphibians, reptiles, birds, mammals</p> <p>Plants and animals can be grouped using observable features.</p>	<p>Animals and plants can be identified and grouped. This is linked to habitat.</p>		<p>Plants and animals can be grouped using a wider range of characteristics</p> <p>Keys are used for the identification of animals and plants</p>		<p>A wider range of living things including micro-organism can be identified</p>
<p>Lifecycles</p>	<p>Recognise changes in themselves as they grow.</p> <p>Learn the simple life cycles of butterflies and frogs.</p>		<p>Plants: seeds and bulbs grow into plants</p> <p>Animals, including humans, reproduce offspring which grow into adults</p>	<p>Plants make seeds to produce more plants (sexual reproduction)</p>		<p>Life cycles differ for different species</p> <p>Plants can reproduce asexually</p> <p>Human development has different stages between birth and death</p>	<p>Living things produce offspring of the same kind, but not identical</p>
<p>Interdependence</p>			<p>Different plants and animals live in different places to which they are suited—by giving them food and shelter</p> <p>Animals get their food from plants and</p>				<p>Plants and animals are adapted to suit their environment</p> <p>Environmental change and human impact affects different habitats differently</p>

			other animals and in turn are consumed by other animals				Adaptation may lead to evolution
Vocabulary	<p>Animals Including Humans: Parts of the human body, skeleton, bones Hibernate, Nocturnal. Adult/parent, baby. Lifecycle: - Egg, caterpillar, chrysalis, butterfly. Birds, insects/ minibeasts</p> <p>Plants: Grow, bulb, seed Lifecycle: - Roots, shoots, stem, leaves, buds, flower, Water, light, warmth, temperature, soil, compost</p> <p>Habitats - Woodland, desert, ocean, jungle, Arctic. Microhabitats: - Log, stone, tree, dead leaves, soil. Environment, recycling, Woodland, city, Playground</p>	<p>Animals Including Humans: Amphibians, birds, fish, mammals, reptiles, carnivore, herbivore, omnivore, sight, hearing, touch, taste, smell</p> <p>Plants: Roots, stem, leaves, flowers, petals, fruit, seeds, bulbs</p>	<p>Animals Including Humans: Adult, grow, life cycle, offspring, young, live young, diet, disease, exercise, germs, hygiene, nutrition, pulse</p> <p>Plants: Germination, sprout, shoot, seed dispersal, sunlight, water, temperature, nutrition</p> <p>Habitat, microhabitat, life processes, living, dead, never living, food chain, food sources</p>	<p>Animals Including Humans: Healthy, nutrients, energy, vertebrate, invertebrate, muscles, tendons, joints</p>	<p>Animals Including Humans: Canine, carnivore, consumer, decay, digestion, herbivore, incisor, molar, omnivore, premolar, producer</p> <p>Living things and their habitats: Organism, classifying, vertebrate, invertebrate, mammal, habitat, classification key, deforestation, characteristics</p>	<p>Animals Including Humans: Adolescence, adult, child, foetus, gestation, reproduction, life expectancy, hormones, menstruation, testosterone</p> <p>Living things and their habitats: Seed dispersal, stigma, stamen, pollination, life cycle, root, germination, petal, pollen, metamorphosis, fertilisation</p>	<p>Animals Including Humans: Aorta, arteries, atrium, blood vessels, capillaries, carbon dioxide, circulatory system, deoxygenated heart, lungs, nutrients, organ, oxygen, oxygenated pulse, respiration, veins, vena cava, ventilation, ventricle</p> <p>Living things and their habitats: Classification, vertebrates, invertebrates, microorganism, species, fungi, taxonomist, bacteria, ecosystem, characteristic, exoskeleton, endoskeleton, distinguish, organisms</p> <p>Evolution: Adaptation, breeding, environment, evolution, inherit,</p>

							fossil, characteristics, genes, extinct, palaeontology
Chemistry							
Materials – describing and using	<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name some everyday materials.</p> <p>Use senses to explore a wide range of materials.</p>	<p>There are different materials and they are used to make different objects</p> <p>Different materials, Including rocks, have different properties.</p> <p>Materials can be sorted into groups according to their observable properties</p>	<p>Different materials are suitable for different uses (Properties that can be observed)</p>		<p>Materials can be solids, liquids or gases</p>	<p>Different properties make materials suitable for different uses (properties that can be measured)</p> <p>Materials can be sorted into groups according to properties including hardness, solubility, transparency, conductivity (Electrical and thermal) and response to magnets</p>	
Changing materials	<p>Name some familiar solids and liquids.</p> <p>Understand changing states in some matter i.e., water/ice.</p> <p>Talk about some shapes that can be</p>		<p>The shape of some solid materials can be changed by a contact force acting on them</p>		<p>Some materials change state when heated or cooled Heating causes melting and evaporation Removing heat causes condensing and solidifying (freezing)</p>	<p>Some materials will dissolve in a liquid</p> <p>Changes including baking, burning and the reaction of certain chemicals result in new materials</p>	

	changed, e.g., by pinching, squashing, bending, twisting and stretching.					Changes that result in new materials are not usually reversible Dissolving, mixing and changes of state are reversible changes	
Mixing and Separating materials				Soils are a mixture of rocks and organic matter Fossils are formed when trapped within rock.		Mixtures can be separated by filtering, sieving and evaporating	
Vocabulary	Object, material, properties, suitable, recycling. Properties - Waterproof, strong/weak, hard/soft. Materials: - Bubble wrap, foil, plastic, fabric, paper, straw, sticks, bricks, metal, glass	Object, squashy, smooth, bumpy, dull, brittle, hard, waterproof, absorbent, flexible, opaque, transparent	Object, squashy, smooth, bumpy, dull, brittle, hard, waterproof, absorbent, flexible, opaque, transparent	Igneous rock, sedimentary rock, metamorphic rock, magma, lava, fossilisation, palaeontology, erosion	Materials, matter, volume, heating, cooling, melting point, freezing point, evaporation, condensation, gas, liquid, solid	Materials, solids, liquids, gases, melting, freezing, evaporating, condensing, conductor, insulator, solution, reversible, irreversible	
Physics							

Light	Observe and name sources of light, including electric lights, flames and the Sun	We see with our eyes		We need light to see things Darkness is the absence of light When light hits a material, some of it is reflected off the material Some materials block the light and a shadow			Light travels in straight lines Shadows have the same shape as the object that casts them We see light from a source reflected off an object into our eyes
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				is formed Sunlight can be dangerous The size of shadows change according to the size and shape of objects and distance from the light source			
Sound	Observe and name a variety of sources of sound	We hear with our ears			Sounds are made when something vibrates Sounds get fainter the further they are from the source The volume of a sound can be changed The pitch of a sound can be changed		
Electricity	Identify the brightest bulb. Name equipment that uses electricity. Identify some electricity dangers.				Electrical appliances need a source of electricity to work A complete circuit is needed for an electric current to flow		There are recognised symbols for circuits and their components An increase in voltage will cause an increase in current

					<p>A circuit is made up of different components</p> <p>A switch opens and closes a circuit</p> <p>Some materials are better conductors than others</p>		Some components can resist the current more than others.
Forces	<p>Talk about and describe movements made.</p> <p>Talk about and describe the movement of objects, e.g., squashing, turning, rolling, pushing</p>		<p>Pushing and /or pulling can make things start moving, stop, go faster or slower</p>	<p>Pushing and /or pulling can make things start moving, stop, go faster or slower</p> <p>Some forces need contact between two objects (contact forces)</p> <p>Some forces act between objects Although they are not in contact (non-contact forces)</p> <p>Magnets can act at a distance.</p> <p>Some materials are magnetic, some are not</p> <p>Magnets exert attractive and</p>		<p>The force of gravity caused by the Earth pulls objects towards its centre</p> <p>Some mechanisms allow a smaller force to have a greater effect</p> <p>Drag forces resist movement</p>	

				repulsive forces on each other			
Earth in Space	<p>ELG Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Name the four seasons and describe the changes that take place.</p> <p>Observe and describe the weather associated with the seasons.</p>	<p>Temperature and day Length changes over the year – this pattern is referred to as the seasons</p>				<p>The Earth, Sun and Moon are approximately spherical</p> <p>The Earth rotates on its own axis once every 24 hours</p> <p>The Earth orbits the Sun once every year</p> <p>The Earth is one of eight planets that orbit the Sun</p> <p>The Moon orbits the Earth and looks different at different times of the month</p> <p>It is due to the rotation of the earth that we experience day and night</p>	

<p>Vocabulary</p>	<p>First, next, then, groups, sequence, material, sink, float, waterproof, bubble wrap, foil, plastic, fabric, paper, straw</p> <p>Seasons: Spring (growth, baby animals) - Summer - Autumn (Harvest) - Winter, Weather: - Sun, rain, wind, snow, ice, frost, sleet, hail. - Cold/warm/hot, Day length, day light.</p>	<p>Seasons: spring, summer, autumn, winter, weather, daylight</p>		<p>Force: friction, motion, accelerate, decelerate, balanced force, magnet, magnetic, pole, attract, repel, magnetic field</p>	<p>Light: light source, dark, reflection, reflect, reflective, rag, shadow, opaque, translucent, transparent</p> <p>Sound: Vibrations, pitch, volume, sound wave, anvil, stirrup, hammer, cochlea, ear drum, soundproofing, condensation, amplitude, particles, decibel</p> <p>Electricity: electricity, generate, renewable, non-renewable, appliances, battery, circuit, wire, bulb, cell, switch</p>	<p>Earth and space: Sun, solar, earth, moon, lunar, crater, sphere, spherical, disc, circumnavigate, gravity, orbit, rotate, axis, day, year, lunar month, phase, horizon</p> <p>Forces: Force, gravity, force meter, air resistance, newton, water resistance, friction, mass, weight</p>	<p>Light: Angle, light, mirror, opaque, reflects, shadows, source, surface, torch, translucent, transparent, refraction, light source, periscope</p> <p>Electricity: Ammeter, battery, buzzer, cell, circuit, component, conductor, current, electricity, fuel, insulator, mains, motor, resistor, voltage</p>
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