Bishop Ellis Catholic Voluntary Academy

Science Intent

At Bishop Ellis Catholic Primary School we aim to provide a high-quality science education with the foundations for understanding God's world through the specific disciplines of biology, chemistry and physics. Children will be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key knowledge and concepts, children will be able to recognise the power of rational explanation and develop a sense of excitement and curiosity about God's world. We intend for children to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. Our curriculum for science aims to ensure that all pupils:

- develop core scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- have a deep knowledge 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
- have the requisite scientific knowledge required to understand the uses and implications of science, today and for the future.

The intent of our science curriculum is for children to develop a secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

We expect children to be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. We expect children to use specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

The idea of 'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and will be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. We understand the concept of 'Working scientifically' will be developed further at key stages 3 and 4, and we work closely with secondary partner schools to ensure that children have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

BISHOP ELLIS SCIENCE CURRICULUM PLAN

EYFS						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
MAIN TEXT	Marvelous Me	Jump into Autumn		Julia Donaldson-Spinderella	Three Little Pigs Jack and the Beanstalk	Baboon on the Moon
UNIT OF WORK and KEY CONCEPTS	Know and talk about the different factors that support their overall health and wellbeing: • regular physical activity • healthy eating • toothbrushing • sensible amounts of 'screen time' • having a good sleep routine • being a safe pedestrian Teeth To know we have two sets of teeth in our lifetime primary (milk) and permanent. To know how to keep our teeth clean To know which foods, help our teeth to keep healthy.	Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Describe what they see, hear and feel whilst outside.		Habitats. Begin to understand the need to respect and care for the natural environment and all living things Understand the key features of the life cycle of a plant and an animal Explore the natural world around them making observations, drawing pictures of spiders Use all their senses in hands-on exploration of natural materials Recognise some environments that are different to the one in which they live.	Materials Ask questions to find out more and to check they understand what has been said to them. Talk about the differences between materials and changes they notice. Explore and talk about different forces they can feel. Describe what they see, hear and feel whilst outside.	Talk about what they see, using a wide vocabulary. Recognise some environments that are different from the one in which they live. Explore the natural world around them. Know the vocabulary needed to name specific features of the world, both natural and made by people.

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Year 1						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
UNIT OF WORK and KEY CONCEPTS	Naming and Grouping 'BQ01 Biology: What are living things and what are they made of?' 'BQ04 Biology: Why are there similarities and differences between living things?' This unit focuses on asking simple questions, identifying and classifying common animals, and gathering data. It includes identifying animals like fish, amphibians, reptiles, birds, and mammals, categorising them as carnivores, herbivores, or omnivores, and comparing their structures. Naming and grouping familiar animals Naming mammals Naming birds and reptiles Naming fish and amphibians Animal structure What animals eat	Seasonal changes: autumn and winter. BQ03 Biology: How do living things live together in their environments? BQ12 Physics: How do we see, hear and communicate? BQ14 Physics: How does the Earth fit into the Universe? This unit explores observing changes across autumn and winter, including weather patterns and variations in day length. It emphasises asking questions, using simple equipment for observations, identifying and classifying, gathering data, and using observations to answer questions. Signs of autumn Weather in autumn Signs of winter Weather in winter Day length in winter	Human body parts BQ01 Biology: What are living things and what are they made of? BQ04 Biology: Why are there similarities and differences between living things? BQ12 Physics: How do we see, hear and communicate? This unit focuses on identifying, naming, and labelling the basic parts of the human body, linking each part to its associated sense. It emphasises closely observing using simple equipment, classifying findings, gathering and recording data, and using observations to suggest answers to questions. Humans are animals Body parts on the outside Body parts on the inside Body parts for our senses More about sight, smell and sound	Identifying plants and their basic parts BQ01 Biology: What are living things and what are they made of? BQ04 Biology: Why are there similarities and differences between living things? This unit focuses on identifying and naming common wild and garden plants, including deciduous and evergreen trees. It covers the basic structure of flowering plants and trees. Emphasis is on asking questions, observing closely, classifying, and gathering data to suggest answers to questions. Plants around our school or home Structure of a tree Naming trees Deciduous and evergreen trees Structure of a flowering plant	Seasonal changes: spring and summer BQ03 Biology: How do living things live together in their environments? BQ12 Physics: How do we see, hear and communicate? BQ14 Physics: How does the Earth fit into the Universe? This unit explores observing changes across spring and summer, including weather patterns and variations in day length. It emphasises asking questions, using simple equipment for observations, identifying and classifying, gathering data, and using observations to answer questions. Signs of spring Weather in spring Signs of summer Weather in summer Day length in summer	**Everyday materials** BQ06 Chemistry: How do we explain how substances behave? BQ07 Chemistry: What are things made of? BQ10 Physics: Why do materials have different properties? BQ15 How can we live sustainably to protect Earth for a better future? This unit focuses on distinguishing objects from the materials they are made of, identifying common materials like wood, plastic, and metal, and describing their physical properties. It involves comparing and grouping materials, performing simple tests, and using observations to answer questions. Everyday objects and materials Materials for recycling Material properties Waterproof materials: plan and do

			More about taste and touch	Common flowering plants Wildflowers		Waterproof materials: review Transparent and opaque materials: plan and do Transparent and opaque materials: review

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Year 2						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
UNIT OF WORK and KEY CONCEPTS	Uses of everyday materials BQ07 Chemistry: What are things made of? BQ08 Chemistry: How can substances be made and changed? BQ10 Physics: Why do materials have different properties? This unit explores identifying and comparing the suitability of everyday materials like wood, metal, and plastic for specific uses. It examines how solid objects' shapes can change by squashing, bending, twisting, and stretching. The focus is on simple tests, and using data to answer questions. Materials and their uses Suitable and unsuitable materials Where materials come from Absorbent materials Stretchy materials Changing shape: plan and do Changing shape: review	Growing plants BQ02 Biology: How do living things grow and reproduce? BQ05 Biology: How do living things stay healthy? BQ15 How can we live sustainably to protect Earth for a better future? This unit covers observing and describing how seeds and bulbs grow into mature plants, and understanding how water, light, and temperature affect plant growth and health. It involves performing simple tests, using observations to answer questions, and gathering data to explore plant needs. Plants from seeds Plants from bulbs What plants need to grow and stay healthy Plant health and growth Plants without water Plants without warmth Plants without light	New life BQ02 Biology: How do living things grow and reproduce? BQ05 Biology: How do living things stay healthy? This unit explores how animals, including humans, have offspring that grow into adults and examines their basic survival needs, such as water, food, and air. It focuses on asking questions, observing closely, identifying and classifying, and using observations to suggest answers to questions. Young animals Growing up Animal life cycles Changes in animal life cycles The basic needs of animals	Introduction to food chains BQ03 Biology: How do living things live together in their environments? This unit covers how animals obtain food from plants and other animals using simple food chains. It includes identifying and naming different food sources, asking questions, classifying, and gathering and recording data to answer questions about animal diets and food chains. How animals get food Introduction to food chains Roles within food chains Comparing food chains	Living things and where they live BQ01 Biology: What are living things and what are they made of? BQ03 Biology: How do living things live together in their environments? This unit explores the differences between living, dead, and non-living things and examines how habitats support the needs of various plants and animals. It involves identifying and naming plants and animals in different habitats, using observations to classify, gather data, and answer questions. Living or non-living Living things and movement Alive, dead and never alive Animal habitats Plant habitats Plants and animals in microhabitats Protecting microhabitats	Healthy me BQ05 Biology: How do living things stay healthy? This unit covers the importance of exercise, balanced nutrition, and hygiene for humans. It involves performing simple tests, observing closely, and identifying and classifying information. Emphasis is on asking questions, using observations to suggest answers, and gathering and recording data. Washing hands Brushing teeth The importance of exercise Different types of food Different amounts of food Food scientists Staying healthy

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Year 3						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST2
UNIT OF WORK and KEY CONCEPTS	Rocks and soils BQ07 Chemistry: What are things made of? BQ09 Chemistry: How can we explain changes in the air, land and oceans? BQ10 Physics: Why do materials have different properties? BQ15 How can we live sustainably to protect Earth for a better future? This unit covers comparing and grouping rocks based on appearance and physical properties, understanding fossil formation, and recognising that soils are made from rocks and organic matter. It involves setting up practical enquiries, making observations, and using evidence to answer questions. Introduction to rocks The appearance of rocks Physical properties of rocks: hardness Physical properties of rocks: permeability Everyday uses of rocks	Introduction to the human skeleton and muscles BQ01 Biology: What are living things and what are they made of? This unit explores the role of skeletons and muscles in humans and other animals for support, protection, and movement. It involves setting up practical enquiries, making observations, measuring accurately, recording findings, and using results to draw conclusions and suggest improvements. The human skeleton: support The human skeleton: protection Bone length: plan and do Bone length: review Animal skeletons Animals without bones Muscles for movement.	Simple forces including magnets BQ11 Physics: How do forces make things happen? BQ13 Physics: How do electricity and magnetism work? This unit explores how objects move on different surfaces and examines magnetic forces, including attraction, repulsion, and magnetic materials. It covers identifying magnetic poles and predicting interactions and emphasizes practical tests, observations, and presenting findings. Different surfaces: plan Different surfaces: do and review Contact forces Magnetic force at a distance Different magnets and their parts Magnetic and non-magnetic materials Putting magnets together: attract or repel Blocking magnetic	Healthy eating BQ02 Biology: How do living things grow and reproduce? BQ03 Biology: How do living things live together in their environments? BQ05 Biology: How do living things stay healthy? BQ15 How can we live sustainably to protect Earth for a better future? This unit covers how animals, including humans, obtain nutrition from their diet, emphasising the need for the right types and amounts of food. It involves asking questions, gathering and presenting data, using scientific language, and interpreting evidence to answer questions and support findings. Making or finding food Types of food Amounts of food Nutrition from food Different diets for different people	What plants do and what they need BQ01 Biology: What are living things and what are they made of? BQ02 Biology: How do living things grow and reproduce? This unit explores the functions of different parts of flowering plants, including roots, stems, leaves, and flowers. It investigates plant requirements for growth and the role of flowers in pollination, seed formation, and dispersal. Emphasis is on practical enquiries, and data presentation. What plants need: plan What plants need: do The function of leaves The function of roots Plants without roots How water is transported in plants What plants need: review The function of flowers The parts of a flower Pollination Seed formation and seed dispersal	Introduction to light and shadows BQ10 Physics: Why do materials have different properties? BQ12 Physics: How do we see, hear and communicate? This unit explores the nature of light, recognising that light is needed to see and that dark is the absence of light. It covers how light reflects and shadow formation. The unit emphasises practical tests, observations, accurate measuring, and using evidence to support findings. Light and seeing Light sources Protecting our eyes from the Sun: plan Protecting our eyes from the Sun: do and review Opaque, transparent and translucent Making shadows Shadow size: plan Shadow size: do Shadow size: review Reflected light: plan Reflected light: do and

	Weathering and erosion of rocks How fossils are formed More about fossil formation What soils are made from How geologists work		force		Life cycle of a flowering plant What plants need: final review Comparing what plants need in different habitats	review

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Year 4						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
UNIT OF WORK and KEY CONCEPTS	Rocks and soils BQ07 Chemistry: What are things made of? BQ09 Chemistry: How can we explain changes in the air, land and oceans? BQ10 Physics: Why do materials have different properties? BQ15 How can we live sustainably to protect Earth for a better future? This unit covers comparing and grouping rocks based on appearance and physical properties, understanding fossil formation, and recognising that soils are made from rocks and organic matter. It involves setting up practical enquiries, making observations, and using evidence to answer questions. Introduction to rocks The appearance of rocks Physical properties of rocks: hardness Physical properties of rocks: permeability	Simple forces including magnets BQ11 Physics: How do forces make things happen? BQ13 Physics: How do electricity and magnetism work? This unit explores how objects move on different surfaces and examines magnetic forces, including attraction, repulsion, and magnetic materials. It covers identifying magnetic poles and predicting interactions and emphasizes practical tests, observations, and presenting findings. Different surfaces: plan Different surfaces: do and review Contact forces Magnetic force at a distance Different magnets and their parts Magnetic and non-magnetic materials Putting magnets together: attract or repel Blocking magnetic force	Introduction to states of matter and changing states BQ07 Chemistry: What are things made of? BQ08 Chemistry: How can substances be made and changed? BQ10 Physics: Why do materials have different properties? BQ15 How can we live sustainably to protect Earth for a better future? This unit explores the properties of solids, liquids, and gases, and how materials change state when heated or cooled. It covers evaporation, condensation, and the water cycle, with a focus on practical enquiries, careful observations, accurate measurements, and presenting findings. Properties of solids, liquids and gases Comparing and grouping solids, liquids and gases Changing state: solid to liquid	Review unit.	Introduction to the human digestive system BQ05 Biology: How do living things stay healthy? This unit covers the basic functions of the human digestive system and identifies different types of teeth and their functions. It focuses on asking questions, gathering and presenting data, recording findings with diagrams and charts, and reporting results through written and oral presentations. Types of teeth The functions of teeth Different teeth for different food The human digestive system More about the journey of food Presenting the human digestive system	Introduction to sound BQ10 Physics: Why do materials have different properties? BQ12 Physics: How do we see, hear and communicate? This unit explores how sounds are made through vibrations, how they travel through mediums, and how pitch and volume relate to vibration strength. It also covers why sounds get fainter with distance. The emphasis is on practical enquiries, observations, and using results to draw conclusions. How sounds are made How vibrations travel Vibrations and solid materials Louder and quieter sounds Measuring the volume of sounds Sound insulation Distance from sounds: plan Distance from sounds: do and review Higher and lower sounds

	Everyday uses of rocks Weathering and erosion of rocks How fossils are formed More about fossil formation What soils are made from How geologists work		Changing state: liquid to solid Thermometers and data loggers Melting temperatures: plan Melting temperatures: do and review Melting temperatures: research Changing state: liquid to gas Changing state: gas to liquid Evaporation and condensation in the water cycle Temperature and evaporation: plan Temperature and evaporation: do and review			Changing the pitch of sounds Musical instruments and pitch

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Year 4/5						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
UNIT OF WORK and KEY CONCEPTS	**Physics Earth and space** Know about and explain the movement of the Earth and other planets relative to the Sun Know about and explain the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon (using the term spherical) Know and demonstrate how we get night and day and the apparent movement of the sun across the sky	**Physics Electricity** Identify and name appliances that require electricity to function Construct a series circuit Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) Predict and test whether a lamp will light within a circuit. (part of a complete loop with a battery) Know the function of a switch Know the difference between a conductor and an insulator; giving examples of each	**Biology Animals including humans** Skeleton, muscles and exercise and health. Know about the importance of a nutritious, balanced diet know that humans and some animals have a skeletal and muscular system for support, protection and movement. Create a timeline to indicate stages of growth and development to old age in humans	**Biology Plants** Know the function of different parts of flowing plants and trees Know what different plants need to help them survive and how this varies from plant to plant Investigate how water is transported within plants Know the plant life cycle, especially the importance of flowers	**Biology Living things and their habitats** Group living things in different ways Explore and use classification keys to group, identify and name living things *Create classification keys to group, identify and name living things (for others to use)* Know how changes to an environment could endanger living things Know the life cycle of different living creatures, e.g. mammal, amphibian, insect, bird	**Physics Light, reflection and shadow** Recognise that they need light to see things Notice that light reflect from surfaces. Know that the sun can be dangerous and ways to protect their eyes Recognize how shadows are formed from light source is blocked by opaque object Find patterns in the way that the size of shadows change

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Year Y5/6						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
UNIT OF WORK and KEY CONCEPTS	Properties, changes and separating materials BQ06 Chemistry: How do we explain how substances behave? BQ07 Chemistry: What are things made of? BQ10 Physics: Why do materials have different properties? BQ15 How can we live sustainably to protect Earth for a better future? This unit explores the properties of everyday materials, including hardness, solubility, and conductivity. It covers reversible changes like dissolving and mixing, and irreversible changes such as burning. Emphasis is on scientific enquiries, data recording, and presenting findings with evidence. Properties of materials Uses of everyday materials Thermal insulators: plan Thermal insulators: do	Light and how it travels BQ10 Physics: Why do materials have different properties? BQ12 Physics: How do we see, hear and communicate? This unit explores how light travels in straight lines, explaining how we see objects and why shadows form the shape of the object casting them. It focuses on planning scientific enquiries, taking precise measurements, making predictions, and evaluating evidence to present findings. How light travels Light enters our eyes Reflected light Changing the direction of light Measuring reflected light: plan Measuring reflected light: do and review How shadows form Shadow shapes investigation Multiple shadows	Review	The human circulatory system BQ01 Biology: What are living things and what are they made of? BQ05 Biology: How do living things stay healthy? This unit explores the human circulatory system, identifying the heart, blood vessels, and blood functions. It examines how diet, exercise, drugs, and lifestyle affect body function and details nutrient and water transport in animals. Emphasis is on data recording and presenting findings. Function of the heart Function of blood Function of blood vessels How nutrients and water are transported within humans The circulatory system in humans: plan Circulatory system: do and review	Forces including simple machines BQ11 Physics: How do forces make things happen? This unit covers the effects of gravity, air resistance, water resistance, and friction on objects. It explores how mechanisms like levers, pulleys, and gears magnify forces. Emphasis is on taking precise measurements, recording complex data, and presenting findings. Introduction to gravity Pushes and pulls Friction: plan Friction: do and review Air resistance: plan Air resistance: do and review Water resistance: plan Water resistance: do and review How levers can help us How pulleys can help us How gears can help us Simple machines Design and development of machines	Evolution and inheritance BQ02 Biology: How do living things grow and reproduce? BQ03 Biology: How do living things live together in their environments? BQ04 Biology: Why are there similarities and differences between living things? This unit explores how living things have changed over time, using fossils as evidence of past life. It covers how offspring vary from parents and how adaptation leads to evolution. Emphasis is on planning scientific enquiries, recording data, and evaluating scientific evidence. What fossils can tell us about the past How living things have changed over time Offspring: similar but not identical Inherited characteristics Animal adaptations Charles Darwin and

	and review Everyday uses of thermal insulators Soluble and insoluble Recovering insoluble solids Separating soluble solids from solutions Reversible changes of state More reversible changes Burning: an irreversible change Rusting: an irreversible change More irreversible changes How scientists work					finches Plant adaptations More about plant adaptations The survival of the fittest Evolution: evidence Evolution: presentation