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

CYCLE A						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
Reception	Teeth Ourselves	Introduction to life cycle of a plant and an animal		Habitats	Materials	The natural world around us.
KS1	Chemistry – everyday materials (y1 obj)	Physics -seasonal changes (y1)	Biology Plants		Biology- animals including humans- identify and name common animals.	Biology- animals including humans- basic needs Living things and their habitats- basic food chains
LKS2	Chemistry- rocks	Physics- forces and magnets	Chemistry states of matter. Solids liquids and gases.		Biology- animals including humans- food and nutrition and digestive system	Physics- sound
UKS2		Biology- animals including humans- circulatory system Chemistry- properties and changes		Biology- evolution and inheritance.	Physics- different forces	Physics light- how light travels

CYCLE B						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
Reception	Teeth Ourselves	Introduction to life cycle of a plant and an animal		Habitats	Materials	The natural world around us.
KS1	Biology- Animals including humans. Know the name of parts of the human body	Chemistry -uses of everyday materials (y2)	Biology Plants identify and name plants			Biology- animals including humans- basic life cycle.
LKS2	Biology- Animals including humans- skeletons, muscles, nutrition	Physics- electricity		Biology- Structure and function of plants. Classification of plants.	Biology –Living things and their habitats- classification of living things.	Physics- light. Reflection, shadows
UKS2	Physics Earth and Space	Biology- all living things- differences between different life cycles Animals inc humans-		Biology- living things and their habitats- Classify living things into broad groups	Physics- electricity.	

		stages of growth in humans				

Plants

Animals including humans

Living things and their habitats.

Evolution and inheritance

Materials

Seasonal changes

Electricity

Light

Sound

Forces

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.

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. KS1 CYCLE A						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
MAIN TEXT	**Beegu**	**I am Rosa Parks**	**Little Evie and the Wild Wood**	**Major Glad, Major Dizzy**	**The Owl Who Was Afraid of the Dark**	**Naughty Bus**
UNIT OF WORK and KEY CONCEPTS	**Chemistry- Everyday Materials** Know the name of the materials an object is made from Know about the properties of everyday materials Know the difference between wood, plastic, glass, metal, water and rock Compare and group materials	**Physics- Seasonal Changes** Observe and know about the changes in the seasons. Name the seasons and know about the type of weather in each season.	**Biology- Plants** Know how trees grow from a seed Identify and name trees that are around them. Know and name a variety of common wild and garden plants Know and name the petals, stem, leaves and root of a plant Know the names of the birds in our school grounds.		**Biology- Animals including humans.** Classifying animals Life cycles of animals Know and name a variety of animals including fish, amphibians, reptiles, birds and mammals Classify and know animals by what they eat (carnivore, herbivore and omnivore) Know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals) Know how to sort living and non-living things know the basic stages in a life cycle for animals, (including humans) know why exercise and a balanced diet are important for humans know why having good hygiene are important for humans	
Main enquiry question	**What does Beegu think of life on Planet Earth?**	**Why is it always cold in winter? Why are there so many leaves on the floor?**	**Which plants and animals will we find in our park?**		**Why are humans not like tigers?**	**Why would a dinosaur not make a good pet?**

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. KS1 CYCLE B						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
MAIN TEXT	**Toby and the Great Fire of London**	**Dogger**	**Lost and Found**	**The Last Tree**	**Lila and the Secret of the Rain.**	**Wild.**
CURRICULUM DRIVER UNIT OF WORK and KEY CONCEPTS		**Chemistry: Uses of everyday materials** Identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard Know why a material might or might not be used for a specific job Know how materials can be changed by squashing, bending, twisting and stretching	**Biology- Plants** Know how trees grow from a seed Identify and name trees that are around them. Know what trees need in order to grow and stay healthy (water, light & suitable temperature)	**Biology- Plants** Know how trees grow from a seed Identify and name trees that are around them. Know what trees need in order to grow and stay healthy (water, light & suitable temperature)		**Biology- Living things and their habitats.** Identify things that are living, dead and never lived Know how a specific habitat provides for the basic needs of things living there (plants and animals) Identify and name plants and animals in a range of habitats Match living things to their habitat Know how animals find their food Name some different sources of food for animals Know and explain a simple food chain
Main enquiry question		**What would Traction Man use to build our school?**	**How old are the trees around us?** **How can a plant be healthy?**	**How old are the trees around us?** **How can a plant be healthy?**		**How does 5 a day keep you healthy?**

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. LKS2 CYCLE A						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST2
NOVEL	History - "Stone age boy" Satoshi Kitamura 5 weeks Science - "The Street beneath my feet." 3 weeks	Geography- Escape from Pompeii. 4 Weeks History - Julius Caesar by Andrew Matthews (adapted Shakespeare play). 4 weeks	Who Let The Gods Out- Max Evans Greek Myths- Marcia Williams. (Shared Reading Text)	Who Let The Gods Out- Max Evans Falling out of the sky (Poetry Anthology).	Life on the Farm (Charlotte's Web by E.B. White) The Incredible book eating boy- Oliver Jeffers. (Shared reading text)	Band of Angels – Deborah Hopkinson The sound collector by Roger McGough (Poem)
CURRICULUM DRIVER UNIT OF WORK and KEY CONCEPTS	**Chemistry- Rocks** Compare and group rocks based on their appearance and physical properties, giving a reason Know how fossils are formed Know how soil is made Know about and explain the difference between sedimentary, metamorphic and igneous rock	**Physics Forces and Magnets** Know about and describe how objects move on different surfaces Know how a simple pulley works and use to on to lift an object Know how some forces require contact and some do not, giving examples Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason	**Chemistry States of Matter** Know how the same materials can change in state Know the temperate water boils and freezes Know which materials, other than water, change state Know the difference between solids, liquids and gas Know the terms condensation and evaporation and know what they mean		**Biology- Animals, including humans** Identify and name the parts of the human digestive system Know the functions of the organs in the human digestive system Identify and know the different types of teeth in humans Know the functions of different human teeth. Use food chains to identify producers, predators and prey Construct food chains to identify producers, predators and prey.	**Physics- Sound** Know how sound is made Know how sound travels from a source to our ears Know how sounds are made, associating some of them with vibrating Know the correlation between pitch and the features of the object producing a sound Know the correlation between the volume of a sound and the strength of the vibrations that produced it Know what happens to a sound as it travels away from its source
Main enquiry question	**What do rocks tell us about the way the Earth was formed?**	**What's the attraction?**	**Will you ever see the water you drink again?**		**What happens to the food we eat?**	**Why is the sound made by ****** enjoyed by so many? What's that racket?**

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. LKS2 CYCLE B						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
NOVEL	Giant – Kate Scott	The Buildings that made London- David Long, Josie Shenay	Ancient Egypt- Secrets of the Sun King	The Wind in the Willows by Kenneth Grahame (Penguin Classic and original	The Promise – Nicola Davies I am the seed that grew the tree – Poetry anthology	Orion and the dark- Emma Yarlett. My Shadow – Robert Louis Stevenson (Poetry)
CURRICULUM DRIVER UNIT OF WORK and KEY CONCEPTS	**Biology- Animals including humans.** Skeleton, muscles and exercise and health. know about the importance of a nutritious, balanced diet know how nutrients, water and oxygen are transported within animals and humans know about the skeletal and muscular system of a human	**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 Know the function of a switch Know the difference between a conductor and an insulator; giving examples of each		**Biology- Living things and their habitats** Group living things in different ways 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	**Biology- Plants** Classification of plants and animals Know the function of different parts of flowing plants and trees Know what different plants need to help them survive Know how water is transported within plants Know the plant life cycle, especially the importance of flowers	**Physics- Light** Compare and group rocks based on their appearance and physical properties, giving a reason Know how fossils are formed Know how soil is made Know about and explain the difference between sedimentary, metamorphic and igneous rock
Main enquiry question	**How can Usain Bolt run so fast?**	**How would we cope without electricity for a day?**		**What makes plants and flowers flourish?**	**Which wild animals and plants thrive in our local environment?**	**How far can you throw your shadow?**

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. UKS2 CYCLE A							
TERM	ADVENT 1	ADVENT 2		LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
NOVEL	Kensuke's Kingdom (5 weeks)	Pig Heart Boy (5 weeks)	Polar Express (5 weeks)	Tale from Arabian Nights	Holes	The Man Who walked between 2 Towers- Mordecai Gerstein (+ poetry The Lost Words)	Macbeth
CURRICULUM DRIVER UNIT OF WORK and KEY CONCEPTS		**Biology Animals including humans** Identify and name the main parts of the human circulatory system Know the function of the heart, blood vessels and blood Know the impact of diet, exercise, drugs and lifestyle on health Know the ways in which nutrients and water are transported in animals,	**Chemistry Properties and changes** Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets Know and explain how a material dissolves to form a solution Know and show how to recover a substance from a solution Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating) Know and demonstrate		**Biology Evolution and Inheritance** Know how the Earth and living things have changed over time Know how fossils can be used to find out about the past Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) Know how animals and plants are adapted to suit their environment Link adaptation over time to evolution	**Physics Forces** Know what gravity is and its impact on our lives Identify and know the effect of air resistance Identify and know the effect of water resistance Identify and know the effect of friction Explain how levers, pulleys and gears allow a smaller force to have a greater effect	**Physics Light** Know how light travels Know and demonstrate how we see objects Know why shadows have the same shape as the object that casts them Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

		including humans	that some changes are reversible and some are not Know how some changes result in the formation of a new material and that this is usually irreversible		•Know about evolution and can explain what it is Build on work on rocks. LKS2.		
Main enquiry question	**Why should the rainforests matter to all of us?**	**Why is your heart the most important pump you own?**	**Are all changes irreversible?**		**Have we always looked like this?**	**Does everything that goes up always come down?**	**How can you light up your life?**

BISHOP ELLIS SCIENCE CURRICULUM PLAN

YEAR GROUP. UKS2 CYCLE B						
TERM	ADVENT 1	ADVENT 2	LENT 1	LENT 2	PENTECOST 1	PENTECOST 2
NOVEL	Jamie Drake Equation	War Horse Beowulf	The Silver Sword + WW2 poetry	The Nowhere Emporium – Ross McKenzie	The Tempest (including The Lighthouse)	Wonder – R. J. Palacio
CURRICULUM DRIVER 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 Know what causes day and night Describe the Sun, Earth and Moon (using the term spherical) Know and demonstrate how we get night and day	**Biology living things and their habitats** Know the life cycle of different living creatures, e.g. mammal, amphibian, insect, bird Know the differences between different life cycles Know the process of reproduction in plants Know the process of reproduction in animals **Animals including humans** Create a timeline to indicate stages of growth in humans		**Biology- Living Things and their Habitats** Classify living things into broad groups according to observable characteristics and based on similarities & differences Know how living things have been classified Give reasons for classifying plants and animals in a specific way	**Physics Electricity** Compare and give reasons for why components work and do not work in a circuit Draw circuit diagrams using correct symbols Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer	
Main enquiry question	**Is there anybody out there?**	**How different will you be when you are as old as your grandparents?**		**How can we classify all the world's species?**	**How can we increase electrical power?**	**How can you light up your life?**