St Augustine's Long Term Plan - Science Intent

Science Cycle B

EYFS Prerequisite Skills for Science from Development Matters and Early Learning Goals

EYFS						
	Advent 1	Advent 2	Lent 1	Lent 2	Pentecost 1	Pentecost 2
F1	Me and My Family	Light and Dark (colours)	People Who Help Us	Growing	Creepy Crawlies and Minibeasts	At the Farm
F2	Myself and My Super Power	Castles and Knights (fairy tales)	Space	Dinosaurs	Transport	Animals
EYFS	Communication and Language		Personal, Social, Emotional Development		Understanding of The World	
DM F1	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"		• Make healthy choices about food, drink, activity and toothbrushing.		• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • 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. • Explore & talk about different forces they can feel. • Talk about the differences between materials and changes they notice.	
DM F2	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to		• Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible		• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.	

	explain how things work and why they might happen. • Use new vocabulary in different contexts.	amounts of 'screen time' - having a good sleep routine - being a safe pedestrian.	
ELG	**Listening, Attention and Understanding** • Make comments about what they have heard and ask questions to clarify their understanding.	**Managing Self** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	**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.

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Knowledge in red is aimed at year 1, Knowledge in green is aimed at year 2, Knowledge in black is aimed at both year 1 & 2			
Year 1/2 CYCLE B	**Advent 1**	**Advent 2**	**Lent 1**
Topic	**Chemistry Materials**	**Chemistry Changing Materials**	**Biology** Animals including humans
National Curriculum	• 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.	• 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.	• 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.
Core Knowledge	1. Know how to identify different everyday materials and know some of their uses. Know different everyday materials and the reasons for their use. 2. Know how to identify and group similar uses of materials together. Know how to identify and classify the uses of everyday materials recording observations. (Local walk). 3. Know why different materials can be used to make the same object. Know which properties make some materials suitable for different purposes. Know which properties make some materials suitable or unsuitable for different purposes. 4. Know and demonstrate how the shapes of solid objects made from some materials can be changed (by squashing,	1. Know the difference between natural and human made objects. Know and explain the difference between natural and human made objects recognising their properties. 2. Know some materials melt when heated. Know how and why some materials melt when heated and some do not. 3. Know some materials will harden when cooled. Know how and why some materials will harden when cooled and some do not. 4. Know that some materials do not mix. Know how to investigate that some materials do not mix.	1. Know animals, including humans have o-ffspring which grow into adults. Know and identify the offspring of key animals. Know the different ways in which animals reproduce. 2. Know how humans change as they grow into adults. Know and describe the stages of human development. 3. Know what animals, including humans, need to survive. Know how to identify and explain the basic needs that humans need to survive. 4. Know how to eat a healthy, balanced diet. Know and describe a healthy diet and explain the importance of this.

	bending, twisting and stretching). Know and demonstrate how the shapes of solid objects made from some materials can be changed (by squashing, bending, twisting and stretching. Know that some material's shape cannot be changed). 5. Know why it's important to recycle. Know what recycling is and which materials can be recycled. Know how plastic materials are sorted for recycling and and changed into new products. Know how to identify the best material for a job through an investigation. Know how to investigate the properties of materials, observing closely and performing simple tests. Know how to investigate the properties of materials, observing closely, performing simple tests and gathering and recording information. (L4 Humpty Dumpty).	5. Know that some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing. Know why the shapes of solid objects can be changed and explain how this happens. 6. Know how to test a question by carrying out simple experiment. Know how to test a question by carrying out a simple experiment making a prediction.	5. Know exercise is important to keep our bodies healthy. Know and explain why it is important for humans to exercise regularly.
Wider Knowledge	• Use simple features to compare materials. • Decide how to sort and classify materials into simple groups. • Sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	• Know that some materials are easier to change than others. • Know that some changes are permanent. • Know some reasons why materials need to change.	• Know that mammals give birth to live young and other groups lay eggs. • Know that animals reproduce. • Know that animals including humans, have young animals that look like them. • Know that babies will grow into adults. • Know that animals and plants are living things.
Skills	1. Use 'Uses of Everyday Materials Activity Sheet'; to suggest uses of different everyday materials to explain what 3 different materials can be used for and	• Ask simple questions, recognising that they can be answered in differently. • Make observations using simple equipment.	• Ask simple questions, recognising that they can be answered in differently. • Make observations using simple equipment.

	match the materials to their uses. Using Everyday Materials Photo Cards identify the uses of everyday materials. Children list and consider which everyday materials have the most and least uses. Explain which properties materials have that make them suitable for that use. 2. Observe everyday materials being used in different ways on a local walk. Complete Spotting Uses of Everyday Materials Out and about Activity Sheet. Children to explain what different materials can be used for and group similar uses together. Record observations from the walk and group some similar uses of materials together. 3. Children match the object with the most suitable material it could be made from, verbally explaining their choices. Children read the mini-brief for an object- in pairs suggest which material would/wouldn't be suitable for the job and explain why. Draw their own everyday object and explain why they think different materials have been used to make certain parts. Encourage children to choose an object which is made of more than one material. 4. Children explore the objects and record which can be bent, squashed, twisted and stretched, record 3 objects which can be changed. Children explore the objects and record which can and cannot be bent, squashed, twisted and stretched and record findings giving explanations.	• Perform a simple test. • Know what a variable is. • Perform a fair test. • Identify and classify changes. • Use observations and ideas to suggest answers to questions. • Gather and record data accurately.	• Perform a simple test. • Know what a variable is. • Perform a fair test. • Identify and classify materials based on their properties. • Use observations and ideas to suggest answers to questions. • Gather and record data accurately.

	5. Sort which materials can be recycled and sequence 6 pictures and with support and word bank, label them correctly. Children sequence 8 pictures and write sentences explaining what is happening in each picture, explaining how a plastic bottle gets recycled. 6. Children to be given an email from Humpty Dumpty. Investigate which material would be best to wrap around him to protect him from breaking. Investigate the properties of materials, observing closely and performing simple tests. Investigate the properties of materials, observing closely, performing simple tests and gathering and recording information. (Ref: L4 GS).		
Diversity Links	George Washington Carver- African American. He is best known for coming up with about 300 uses for the peanut. Some of these included flour, paste, paper, soap, shaving cream, and even medicines.	George Washington Carver- African American. He is best known for coming up with about 300 uses for the peanut. Some of these included flour, paste, paper, soap, shaving cream, and even medicines.	To know about women in Zoology when studying animals e.g. Jane Goodall, Terri Irwin, make this explicit to children about females in Science.
Vocabulary	Identify, materials, wood, plastic, glass, metal, rock, brick, paper, cardboard, uses, properties, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not bendy, absorbent, not absorbent, waterproof, not waterproof, transparent, opaque, suitable, unsuitable, purpose, recycle, reuse.	Melt, heat, cool, solid, liquid, mixing, freeze, solidify, inventor, inventions, irreversible, reversible, recycle, squashing, twisting, stretching.	Lifecycle, exercise, diet, balanced, hygiene, food, offspring, survival, adult, hydrated, reproduce, healthy, live young egg, baby, toddler, child, infant, birth, death, parent, healthy, diet, off-spring, exercise, protein, carbohydrate, fats, nutrition, dairy, hygiene, fruits and vegetables.

Year 1/2 CYCLE B	Lent 2	Pentecost 1	Pentecost 2

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Topic	Biology - Plants	Biology Living things and their habitats	Physics Investigation Forces: Floating and Sinking
Core Knowledge (National Curriculum)	• Know, observe and describe how seeds and bulbs grow into mature plants. • Know, find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• 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.	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
Core knowledge	1. Know the main parts of a plant. Know and describe the role of each part of the plant. 2. Know what plants need to grow. Know and identify the things most plants need to germinate and mature. 3. Know what plants need to stay healthy. Know and explain how plants make their own food. 4. Know and explore plants that are living, dead or never lived. Know and compare plants that are living, dead or never lived.	1. Know and identify if things are living, dead, and things that have never been alive. Know and compare the differences between things that are living, dead, and things that have never been alive. 2. Know habitats provide the basic needs of animals and plants. Know habitats are different around the world. Know and identify habitats around the world and explain their differences. 3. Know what conditions woodlice prefer to live in.	1. Know the difference between floating and sinking. Know and explain the difference between floating and sinking. 2. Know how to make predictions and plan and investigation about which objects will float and sink. Know how to make predictions and independently plan an investigation. 3. Know which objects float and which sink. Know why some objects float and some sink. 4. Know how to investigate materials that would be suitable for a boat.

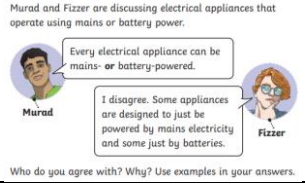
	5. Know germination is the process by which a plant grows from a seed. Know and explain the stages of germination.	Know how to plan an investigation to find out which conditions woodlice prefer and explain why. 4. Know a microhabitat is a very small part of a habitat. Know and identify plants and animals in their habitats, including microhabitats. Know different microhabitats and identify why living things that might live there. 5. Know that most living things live in a habitat to which they are suited. Know and identify characteristics that living things have that make them best suited to the environment they live in. 6. Know a food chain *shows how energy is passed between plants and animals.* Know how to construct a simple food chain. Know and explain what some living things eat and how they are linked in a food chain.	Know how to create a boat that will float and justify my choice. 5. Know how to record which objects float and which sink. Know how to explain results of floating and sinking investigation.
Wider Knowledge	• Know which plants grow from seeds and which plants grow from bulbs. • Know the impact of not having the correct conditions for life. • Know that different plants prefer different conditions to thrive e.g. light and shade.	• Know that food chains start with a producer which is always a plant. • Know that smaller animals can be sources of food for larger animals. • Know that humans can be part of the food chain. • Know that food chains transfer of energy.	• Know and explore materials that would be suitable for a boat.
Skills	• Ask simple questions, recognising that they can be answered differently. • Make observations using simple equipment. • Perform a simple test. • Know what a variable is. • Perform a fair test.	• Ask simple questions, recognising that they can be answered in differently. • Make observations using simple equipment. • Perform a simple test. • Know what a variable is. • Perform a fair test.	• Ask simple questions, recognising that they can be answered in differently. • Make observations using simple equipment. • Perform a science investigation. • Know what a variable is. • Perform a fair test.

	• Identify and classify things. • Use observations and ideas to suggest answers to questions. • Gather and record data accurately.	• Identify and classify animals and living things. • Use observations and ideas to suggest answers to questions. • Gather and record data accurately.	• Identify and classify materials based on their properties. • Use observations and ideas to suggest answers to questions. Gather and record data accurately.
Diversity Links	Plants – Consider how plants are grown in various countries around the world and how this benefits that country.	Jane Goodall – Female scientist who studied the animals for many years in the East African country of Tanzania.	
Vocabulary	Plants, thrive, conditions, light, dark, water, shade, food, temperature, seed, bulb, grow, sun, warm, cool, water, space, healthy, germinate, shoot, seedling, variable.	Life cycle, minibeast, invertebrates, food chain, habitat, micro-habitat, prey, predator, source, consumer, energy, survival, diet, hygiene, camouflage, exercise.	float, sink, absorbent, non-absorbent, waterproof, water, liquid, solid, hollow, buoyancy, aim, prediction, method, fair test, equipment, results, conclusion, variable.

Year 3/4 CYCLE B	**Advent 1**	**Advent 2**	**Lent 1**
Topic	**Physics - Electricity**	**Physics - Sound**	**Chemistry** States of matter
National Curriculum	• 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.	• 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 increase.	• 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.

	• Recognise some common conductors and insulators, and associate metals with being good conductors.		
Core knowledge	1. Know electrical and non-electrical appliances. Know that you can group appliances based on whether they are mains- or battery powered. Know how I can use a Venn diagram to present my findings. 2. Know the different components needed to make a circuit. Know the different components needed to make a circuit and how to draw a labelled diagram of a working circuit. 3. Know if a circuit is complete or incomplete. Know how to identify circuits as incomplete or complete circuits. Know how to explain what makes a complete circuit and why a circuit may be incomplete. 4. Know examples of electrical conductors and insulators. Know what electrical conductors and insulators are and give a range of examples of these. Know how to test materials to identify if they are electrical conductors or insulators. 5. Know the names of different types of switches. Know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Know how to explain how a switch works in a circuit, build switches and report findings.	1. Know how sounds are made. Know how sounds are made identifying which are from vibration. 2. Know that vibrations from sound travel through a medium to the ear. Know that vibrations from sound travel through a medium to the ear and part and explain how it happens. 3. Know how our ear allows us to hear sound. Know and explain how out ear allows us to hear sounds. 4. Know what pitch is and the features of the object that produced it. Know what pitch is and the features of the object that produced it and how it can be altered. 5. Know patterns between the volume of a sound and the strength of the vibrations that produced it. Know that sounds get fainter as the distance from the sound source increases. Know and prove that sounds get fainter as the distance from the sound source increases.	1. Know the different states of matter. Know how to group materials together according to their state of matter. Know how to compare materials according to their state of matter. 2. Know and identify the properties of gases. Know the properties of gases and explore if gases have mass. 3. Know and explore how materials can change state. Know materials change state when they are heated or cooled. Know and describe how materials change state and what happens during the process. 4. Know the temperature at which materials change state. Know how to measure the temperature at which changes occur in degrees Celsius (°C). Know different materials have different freezing and melting points. 5. Know the part played by evaporation and condensation in the water cycle. Know and explain the part played by evaporation and condensation in the water cycle.

	7. Know how to use my knowledge of electricity in new situations. Know how to use scientific evidence to answer questions to support findings. Know how to use my reasoning skills to answer questions and justify my answers using scientific evidence.		
Wider Knowledge	• Know how to be safe with electricity. • Note: pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in Year 6.	• It is important to protect our ears against loud noises as hearing can be damaged. • Know that an individual who having a hearing impairment can be supported through technology. • Know how sound can be amplified.	• Know which materials are solid, liquids or gases. • Know that some materials change state when heated or cooled. • Know that water moves in a cycle due to changes in temperature causing the water to change from one state to another.
Skills	1. Identify electrical and non- electrical appliances. Group appliances into electrical or battery powered. Use appropriate headings for a Venn diagram to sort the appliances into the correct section. Non electrical appliances heading has been given as an example. 2. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. To identify circuit components and build working circuits. Make systematic and careful observations, using a range of equipment. Recording findings using labelled diagrams. 3. Build a series of incomplete and complete circuits using the diagrams given on and record their predictions	Explain how sound is made. Explain how sound is made giving examples of those which are from vibration. Draw a comic strip to show how sound travels when a drum is hit. Draw a comic strip to show how sound travels when a drum is hit and describe what is happening. Draw a diagram to explain how the ear hears sound using some scientific vocabulary. Draw a diagram to explain how the ear hears sounds using more technical scientific vocabulary. Experiment with different instruments and observe how a high and low sound is made and link it to its features. Experiment with different instruments and observe how a high and low sound is made and link it to its features and identified if it can be altered. In groups plan and create a presentation to demonstrate and explain patterns between	• Ask relevant questions and use different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Gather, record, classify and present data in a variety of ways to help in answering questions.

	and findings. Build a series of incomplete and complete circuits using the diagrams given on and record their predictions and findings, explaining why the circuit is complete or incomplete. Identify how to make the incomplete circuits complete. 4. Investigate which materials are electrical conductors or insulators. Carry out an investigation fairly testing materials to identify if they are electrical conductors or insulators. 5. Add a switch into a simple series circuit (bulb, wire and cell). Create a circuit using more than one type of switch identifying similarities and differences in how they work. 6. Using electricity discussion cards to discuss the answers to the questions using knowledge of electricity. Use reasoning skills to answer the questions on discussion cards. Eg 	the volume of a sound and the strength of the vibrations that are produced (Presentational – Oracy - Voice 21) Plan and carry out an experiment to investigate whether sounds gets fainter as distance from the sound source increases. Plan and carry out an experiment to prove and explain why sounds get fainter as the distance from the sound source is increased. (Alarm clock or string telephone).	• Identify differences, similarities or changes related to simple scientific ideas and processes. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward scientific evidence to answer questions or to support their findings. • Use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions. • Make a prediction and give a reason for this. • Identify the differences, similarities and changes related to an enquiry.
Diversity Links	Granville T. Woods- known as the "Black Edison," since he had 150 patents, and 35 of them are in the field of electricity and electromagnets.	Walter Linker Hawkins – Black scientist who made universal service in phones available.	Look at different physicists in this field. Focus on female physicians who continue to challenge the stereotype of what a scientist looks like.
Vocabulary	electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection,	Vibrate, vibration, vibrating, air, medium, ear, hear, sound, volume, pitch, faint, fainter loud, louder, string, percussion, woodwind brass insulated canal brain pinna/pinna,	Solid, liquid, gas, particles, melting, freezing, heating, cooling, viscosity, water cycle, precipitation, condensation, evaporation,

	short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	eardrum, ear canal semi circular canal, cochlea, auditory nerve, hammer, anvil, strirrup	collection, degrees Celsius, state, solidifying point, particles, vapour, precipitation.

Year 3/4 CYCLE B	Lent 2	Pentecost 1	Pentecost 2
Topic	**Biology - Living Things**	**Biology Teeth**	**Biology Digestion**
National Curriculum	• Know and describe the simple functions of the basic parts of the digestive system in humans. • Know and identify the different types of teeth in humans and their simple functions.	• 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.	• Describe the simple functions of the basic parts of the digestive system in humans. • Construct and interpret a variety of food chains, identifying producers, predators and prey.
Core Knowledge	1. Know and explain the seven life processes. Know and explain how animals and plants complete each of the life processes. 2. Know that living things can be grouped in a variety of ways. Know and explain how to group organisms according to their characteristics. 3. Know how to use a classification key to name animals. Know how to create their own simple classification key to group animals. 4. Know and identify a variety of habitats. Know and explain why organisms live in different habitats.	1. Know and identify the different teeth and describe their functions. Know and explain that the shape of teeth make them useful for different purposes. 2. Know what plaque is and how this causes tooth decay. Know and explain how plaque causes tooth decay. 3. Know the different ways of keeping teeth healthy. Know and explain what happens to teeth during the lifetime of humans and ways we can ensure our teeth stay healthy. 4. Know how drinks can cause tooth decay.	1. Know the basic parts of the digestive system. Know the parts of the digestive system and describe their functions. 2. Know the functions of the organs in the digestive system. Know and explain the function of the organs in the digestive system. 3. Know the process of digestion and its importance. Know and explain the process of digestion. 4. Know how to create a model of the digestive system. Know how to construct a model which explains the parts of the digestive system. 5. Know what producers, predators and prey are and identify them in a food chain.

	5. Know how living things live in habitats that are suited to their needs. Know how changes to an environment could endanger living things and their habitats.	Know how to plan and conduct an investigation to find out which drink causes the most tooth decay. 5. Know why animals have different types of teeth. Know and classify carnivores, herbivores and omnivores. Know how to classify animals according to their diet. 6. Know what producers, predators and prey are and identify them in a food chain. Know how to construct and explain a variety of food chains.	Know how to construct and interpret a variety of food chains.
Wider Knowledge	• Know which living things they would expect to find in their locality and which they would not find. • Know what a branching data base is and how to use one.	• Know how to care for and keep teeth healthy. • Use knowledge of an animal's diet to identify which type of teeth they have. • Know that humans have a responsibility to care about their impact on the food chain.	• Know what can happen to your body if the digestive system isn't working properly.
Skills	• Ask relevant questions and use different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	• Ask relevant questions and use different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	• Ask relevant questions and use different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

	• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward scientific evidence to answer questions or to support their findings. • Use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions. • Make a prediction and give a reason for this. • Identify the differences, similarities and changes related to an enquiry.	• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
Diversity Links	Consider dangers to animals in different countries across the world and link this to the culture of that country.		
Vocabulary	Vertebrate, invertebrate, mammal, amphibian, fish, reptile, bird, environment.	mouth, teeth, saliva, incisor, canine, molar, premolar, filling, tooth decay, plaque, mouth, saliva, herbivore, carnivore, omnivore, producer, predator, prey.	mouth, saliva, oesophagus, stomach, acid, digestive enzymes, small intestine, nutrients, large intestine, rectum.

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Year 5/6 CYCLE B	Advent 1	Advent 2	Lent 1
Topic	**Physics - Electricity**	**Physics - Light**	**Biology** Living things and their habitats
(National Curriculum)	• 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.	• 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. • 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.	• 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.
Core knowledge	1. Know how our understanding of electricity has changed over time. Know how major discoveries affected our understanding and use of electricity. Know the difference between alternating and direct current. 2. Know the scientific symbols for the main parts of a circuit. Know how to create a circuit diagram using scientific symbols. 3. Know how to draw circuit diagrams indicating the voltage. Know the effects of differing voltages in a circuit. Know how to explain the effect of increasing or decreasing the voltage on different parts of a circuit.	1. Know that light appears to travel in straight lines. Know the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. 2. Know different light sources. Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Know how to 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.	1. Know and describe how living things can be classified into broad groups. Know how to sort living things into groups using different criteria, giving reasons why. 2. Know how to use classification keys to help group and identify a variety of living things. Know how to create a classification key to identify animals using their own questions. 3. Know that microorganisms are also living things. Know and explain that microorganisms are living things using an experiment to

	4. Know how to plan an investigation to compare variations in how components function (brightness of bulbs, the loudness of buzzers and the on/off position of switches). Know how to plan in detail an investigation to compare and give reasons for variations in how components function (brightness of bulbs, the loudness of buzzers and the on/off position of switches). 5. Know how carry out an investigation fairly, record findings accurately and write a conclusion giving reasons for the results. Know how to carry out in detail an investigation, choosing an appropriate way to present findings including conclusions, causal relationships and explanations of and degree of trust in results. 6. Know how to use test results to make predictions to set up further comparative and fair tests by planning and conducting a further investigation. Know how to use test results to make predictions to set up further comparative and fair tests by planning and conducting a further investigation explain how else they could further establish a high degree of trust in their results.	3. Know why shadows have the same shape as the objects that cast them. Know Isaac Newton's ideas about light. Know and explain why shadows have the same shape as the objects that cast them. 4. Know the law of reflection. Know that mirrors reflect light and how they can help us see objects. Know how simple optical instruments works. Know and explain how a simple optical instrument works 5. Know through investigation that light enables us to see colour. Know through investigation that light enables us to see colour. Know how to use their scientific knowledge and understanding to explain their findings.	prove that yeast is a living microorganism. 4. Know the five main groups scientists use to classify microorganisms. Know how to classify microorganisms and the characteristics and features of each group. 5. Know who Carolus Linnaeus was and why he is an important scientist. Know and explain who Carolus Linnaeus was and his important work as a scientist.
Wider Knowledge	• Know the need for necessary precautions for working safely with electricity.	• Know some people do not have the gift of sight. • Know the danger of looking at the sun.	• Know who Linnaeus was and his classification system.

	• Know how to work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.	• Know that white light is made up of all the colour.	• Know that living things are classified into broad groups according observable characteristics and bases on similarities and differences including microorganisms, plants and animals. • Know and use a range of high order questioning skills to classify microorganisms.
Skills	1. Explain how our understanding of electricity has changed over time focusing on the main historical discoveries made in the field of electricity. Identifying scientific evidence that has been used to support or refute ideas or arguments in the context of the major discoveries made by scientists in the field of electricity explaining the difference between alternating and direct current. 2. Label parts of a circuit. Convert circuit diagram pictures using scientific symbols. Create a circuit diagram for an electrical appliance using the correct scientific symbols. 3. Examine a range of different batteries and check the number of volts each one supplies. Predict, observe and describe the effects of differing voltages in a circuit, drawing the circuit. Explain the effect of increasing or decreasing the voltage on different parts of a circuit. Draw the circuit diagram of each step with volts labelled accurately. (NB: if the voltage is not written on the	https://southharringayschools.co.uk/year-6-light-experiment/ 1. Carry out the experiment. Explain that light appears to travel in straight lines and why using the experiment as evidence. Present the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye concluding that light travels in straight lines. 2. Draw an annotated diagram to show how light travels from a light source. Draw an annotated diagram to show how light t travels from a light source and write an explanation. 3. Explain that light travels in straight lines and this is why shadows have the same shape as their shadow using a puppet show (Oracy). Explain that light travels in straight lines and this is why shadows have the same shape as their shadow using a puppet show (Oracy) linking it to Issac Newton's discoveries (Oracy).	• How to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • How to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • How to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • How to identify scientific evidence that has been used to support or refute ideas or arguments. • How to report and present 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. • How to use test results to make predictions to set up further comparative and fair tests.

	batteries the children will use to create their circuit, check with manufacturer for details and ensure children know how many voltages each battery supplies). 4. Plan an investigation to compare variations in how components function (brightness of bulbs, the loudness of buzzers and the on/off position of switches). Formulating their own question to plan an investigation to compare and give reasons for variations in how components function (brightness of bulbs, the loudness of buzzers and the on/off position of switches) including recognising and controlling variables. 5. Carry out the investigation using the plan, present findings and write a conclusion giving reasons for findings. Carry out the investigation using the plan, choosing a way to present findings (recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs), including conclusions, causal relationships and explanations of and degree of trust in results. 6. Using test results, make predictions to set up further comparative and fair tests by planning and conducting a further investigation. Use the results to make new predictions. Using test results, make predictions to set up	4. Prove the law of reflection by carrying out an investigation (See angles of incidence and reflection page). Prove the law of reflection by carrying out an investigation (See angles of incidence and reflection page) and complete the seeing reflection challenge (explain how light is travelling to enable the boy to see the computer behind the wall) 5. Make a periscope (optical instrument) and a guide to explain how it works (using the support sheet for some steps. Make a periscope (optical instrument) and a guide to explain how it works using all the scientific vocabulary. 6. Carry out an investigation to show that light enables us to see colour. Carry out an investigation to show that light enables us to see colour (using their scientific knowledge and understanding to explain their findings)	

	further comparative and fair tests by planning and conducting a further investigation. Use the results to make new predictions explaining how they intend to ensure a high degree of trust in their results.		
Diversity Links	Latimer is a brilliant black inventor who pushed through adversity to create the carbon light bulb filament. He is truly legendary in the field of electricity for his work. Before the carbon light bulb filament, people used oil and candles to burn for light. His version of the light bulb was a safe option!		Focus on Marie Curie physicist and chemist, make this explicit to children about females in Science.
Vocabulary	bulb, battery, cell, wires, switch, motor, buzzer, scientific, informal, circuit, diagram. electricity, Thomas Edison, Nikola Tesla, Alessandro Volta, Michael Faraday, alternating current, direct current, voltage, circuit diagram, brightness, loudness, increase, decrease, investigation, plan, fair test, comparative test, practical enquiry, wire, length.	Light, travels, straight, reflect, reflection, light, source, object, shadows mirrors, periscope, rainbow, filters, angles of incidence and reflection, optical instrument.	Classification, kingdom, phylum, genus, species, order, family, group, sub group, Linneaus, opinion, support, similarities, differences, plants animals, organism, microorganism, taxonomy.

Year 5/6 CYCLE B	**Lent 2**	**Pentecost 1**	**Pentecost 2**
Topic	**Biology Evolution and inheritance**	**Biology Circulatory System**	**Biology Reproduction**
Core Knowledge (National Curriculum)	• 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	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	• 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.

	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.	• 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.	
Core knowledge	1. Know that living things produce offspring, but normally offspring vary and are not identical to their parents. Know and explain why offspring vary and are not identical to their parents. 2. Know how plants and animals are adapted to their environment. Know and give reasons why certain variations are advantageous to adapting to their environment. 3. Know that living things have changed over time. Know and explain natural selection and how it may lead to evolution. Know and explain how adaptation and natural selection lead to species evolving over time in order to survive. 4. Know and explain how adaptations may lead to evolution. Know and explain why advantageous characteristics are more likely to be passed on through evaluation and why. 5. Know how fossils help us explain evolution and provide information about living things. Know and explain how fossils teach us about mutations and how external factors affect evolution of a species.	1. Know and identify the main parts of the human circulatory system. Know the main parts of the human circulatory system and explain how the system works. 2. Know and identify the main parts of the heart. Know and explain the main parts of the heart and explain how the heart pumps blood. 3. Know how exercise affects my heart rate. Know and investigate which activity accelerates my heart rate the most. 4. Know and describe how water and nutrients are transported in humans. Know and explain how the blood plays a role in transporting nutrients and water around the body. 5. Know how humans can live a healthy lifestyle. Know and explain the impact of diet, exercise, drugs on the way their bodies function. 6. Know how lifestyle can damage their health. Know and explain the effects of tobacco, alcohol and other drugs.	1. Know the seven life processes. Know and explain the seven life processes. 2. Know and explain how mammals reproduce. Know and explain how mammals gestation periods may vary. 3. Know how all animal groups reproduce. Know and explain the differences between reproduction in animal groups. 4. Know and describe the differences in the life cycles of mammals, amphibians, reptiles, insects and birds. Know how to describe the similarities and differences in life cycles. 5. Know the differences in life expectancy of mammals. Know and explain the differences in life expectancy in animals. 6. Know and understand the reproduction in plants. Know and explain what seed dispersal is and describe seed dispersal methods.

Wider Knowledge	• Know some inherited characteristics in living things. • Know the role fossils have in the development of evolutionary theory. • Know about the work of Anning, Darwin and Wallace. • Know what a cladogram is and how it shows evolutionary relationships.	• Know the components of blood and their functions. • Know there are different blood groups. • Know the name of three blood vessels. • Know that nutrients and water are transported around the body in the blood by diffusion and osmosis. • Know the importance of mental health and wellbeing on the body and mind (Link to DART and PSHE objectives).	• Know that different animals have different gestation periods. • Know that a foetus develops through different stages into a human.
Skills	• How to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • How to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • How to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • How to identify scientific evidence that has been used to support or refute ideas or arguments • How to report and present 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.	• How different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • How to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • How to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • How to identify scientific evidence that has been used to support or refute ideas or arguments. • How to report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust	• Different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Identify scientific evidence that has been used to support or refute ideas or arguments. • Report and present 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. • Use test results to make predictions to set up further comparative and fair tests.

	• How to use test results to make predictions to set up further comparative and fair tests.	in results, in oral and written forms such as displays and other presentations. How to use test results to make predictions to set up further comparative and fair tests.	
Diversity Links	• Link to different genetics and DNA across different groups of people. • Look at people like Rosalind Franklin – A female English scientist who worked with DNA.	Maria M Daly – The first black women to earn a PHD who worked on the circulatory system.	
Vocabulary	Suited/suitable environment, adaptation, characteristics, vary/variation, inherit/inheritance, natural selection, Anning, Darwin, Wallace, cladogram, evolution, relationships, fossils, offspring, sexual reproduction, vary, characteristics, adapted, inherited, species, evolve, evolution.	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle, red blood cells, white blood cells, plasma, platelets, defend, protect, transport.	amphibian, mammal, human, young, old age pensioner, toddler, teenager.