



Our aim is to provide our children with an engaging, exciting, and empowering curriculum that equips them for today and their future. At St Botolph's Church of England Primary School the curriculum is designed to: recognise children's prior learning, provide first-hand learning experiences, allow the children to develop interpersonal skills, build resilience and become creative, critical thinkers.

Curriculum aims:

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry, and physics*
- develop understanding of the nature, processes, and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them*
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.*

Science Intent:

At St Botolph's Primary School, we offer the children high quality first-hand experiences which develop children's natural curiosity. Scientific enquiry is at the heart of exciting and enriching Science lessons of biology, chemistry, and physics and through this, children master both investigative and practical skills that underpin the development of scientific knowledge.

Our intent is that all our pupils, irrelevant of their background or starting point, will be given the opportunity to ask their own questions about the world around them. Through a new carefully planned spiral curriculum, we will give the children the opportunity to develop their own interests, which will help to develop a sense of excitement and curiosity about natural phenomena.

Our Curriculum:

1. Science is split into four main areas in Key Stage 1 and Key Stage 2: Biology, Chemistry, Physics and Scientific Enquiry. The knowledge is taught through Physics, Chemistry and Biology with Scientific Enquiry runs throughout.
2. Science is taught through a spiral curriculum in both Key Stages. The five units required to be taught throughout each year group, given by the National Curriculum, are set out progressively throughout the school year to ensure that the children's skills and knowledge are built on what they already know.
3. In Key Stage 1 Science is taught each week by the class teacher. In Key Stage 2 Science is taught as PPA cover each week.
4. Our curriculum is supported by the Chris Quigley milestones (1,2,3) and leadership knowledge.

Yearly Overview

	Biology	Chemistry	Physics
Reception			
Year 1	Plants Animals, including humans	Everyday materials	Seasonal changes
Year 2	Plants Animals, including humans Living Things and their Habitats	Uses of everyday materials	
Year 3	Plants Animals, including humans	Rocks	Light Forces and magnets
Year 4	Animals, including humans Living Things and their Habitats	States of matter	Sound Electricity
Year 5	Animals, including humans	Properties and changes of materials	Earth and space Forces

	Living Things and their Habitats		
Year 6	Animals, including humans Living Things and their Habitats Evolution and Inheritance		Light Electricity

Progression of Scientific Enquiry

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• Show curiosity about objects, events and people Playing & Exploring • Questions why things happen Speaking: 30-50 months • Engage in open-ended activity Playing & Exploring • Take a risk, engage in new experiences, and learn by trial and error Playing & Exploring • Find ways to solve problems / find new ways to do things / test their ideas Creating & Thinking Critically • Develop ideas of grouping, sequences, cause, and effect Creating & Thinking Critically • Know about similarities and differences in relation to	• Explore the world around them and raise their own simple questions • Experience different types of science enquiries, including practical activities • Begin to recognise different ways in which they might answer scientific questions • Carry out simple tests • Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) • Ask people questions and use simple secondary sources to find answers • Observe closely using simple equipment	• Raise their own relevant questions about the world around them • Should be given a range of scientific experiences including different types of science enquiries to answer questions • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions • Set up simple practical enquiries, comparative, and fair tests • Recognise when a simple fair test is necessary and help to decide how to set it up	• Use their science experiences to explore ideas and raise different kinds of questions • Talk about how scientific ideas have developed over time • Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions • Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why • Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment			

places, objects, materials and living things ELG: The World • Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world The World: 30-50 months • Closely observes what animals, people and vehicles do The World 8-20 months • Use senses to explore the world around them Playing & Exploring • Make links and notice patterns in their experience Creating & Thinking Critically • Choose the resources they need for their chosen activities ELG: Self Confidence & Self Awareness • Handle equipment and tools effectively ELG: Moving & Handling • Create simple representations of events, people and objects Being Imaginative: 40-60+ months • Answer how and why questions about their experiences ELG: Understanding	• With help, observe changes over time • With guidance, they should begin to notice patterns and relationships Use simple measurements and equipment (e.g., hand lenses, egg timers) to gather data • Record simple data • Use their observations and ideas to suggest answers to questions • Talk about what they have found out and how they found it out • With help, they should record and communicate their findings in a range of ways and begin to use scientific language	• Talk about criteria for grouping, sorting, and classifying; and use simple keys • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations • Make systematic and careful observations • Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used • Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them • Take accurate measurements using standard units • learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately • Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard	• Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact • Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately • Take repeat measurements where appropriate • Make their own decisions about what observations to make, what measurements to use and how long to make them for • Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs • Look for different causal relationships in their data and identify evidence that refutes or supports their ideas • Identify scientific evidence that has been used to support or refute ideas or arguments
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• Make observations of animals and plants and explain why some things occur, and talk about changes ELG: The World • Develop their own narratives and explanations by connecting ideas or events ELG: Speaking • Builds up vocabulary that reflects the breadth of their experience Understanding: 30-50 months		units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data • With help, pupils should look for changes, patterns, similarities, and differences in their data in order to draw simple conclusions and answer questions • Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions • With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	• Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results • Use their results to make predictions and identify when further observations, comparative and fair tests might be needed
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Progression of Knowledge

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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Plants		• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	• To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • To investigate the way in which water is transported within plants • To explore the part that flowers play			
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				in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Animals, including humans		• identify and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals • identify and name a variety of common animals	• 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	• To identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • To identify that humans and some other animals have skeletons and muscles for support,	• To describe the simple functions of the basic parts of the digestive system in humans • To identify the different types of teeth in humans and their simple functions • To construct and interpret a variety of food chains, identifying producers,	To describe the changes as humans, develop to old age.	• To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function • To describe the ways in which nutrients and

		that are carni- vores, herbi- vores, and om- nivores • describe and compare the structure of a va- riety of common animals (fish, amphibi- ans, rep- tiles, birds, and mam- mals in- cluding pets) • identify, name, draw and la- bel the basic parts of	(water, food, and air) describe the im- portance for hu- mans of exercise, eating the right amounts of differ- ent types of food, and hy- giene	protection, and movement.	predators, and prey.		water are transported within animals, including humans.
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		the human body and say which part of the body is associated with each sense					
Living things and their habitats			• explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things		• To recognise that living things can be grouped in a variety of ways • To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • To recognise that environments	• To describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird - To describe the life process of reproduction in some plants and animals.	• To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants, and animals • To give reasons for

			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,		can change and that this can sometimes pose dangers to living things.		classifying plants and animals based on specific characteristics.
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			including micro- habitats 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				
Evolution and inheritance							• To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

							• To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Materials		• distinguish between an object and the material from which it is made • identify and name a	• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic,			• To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity	

		variety of every-day materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of every-day materials • compare and group together a variety of every-day materials on the basis of their simple	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			(electrical and thermal), and response to magnets • To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • To use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • To give reasons, based on evidence from comparative and fair tests, for the	
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		physical proper- ties				particular uses of everyday materials, including metals, wood, and plastic • To demonstrate that dissolving, mixing and changes of state are reversible changes • To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	
States of matter					• To compare and group		

					materials together, according to whether they are solids, liquids, or gases • To 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 ($^{\circ}\text{C}$) • To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation		
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					with temperature.		
Rocks				• To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • To describe in simple terms how fossils are formed when things that have lived are trapped within rock • To recognise that soils are made from rocks and organic matter.			
Seasonal Changes		• observe changes across					

		the 4 seasons observe and describe weather associated with the seasons and how day length varies					
Light				- To recognise that they need light in order to see things and that dark is the absence of light - To notice that light is reflected from surfaces - To recognise that light from the sun can be dangerous and that there are ways to			- To recognise that light appears to travel in straight lines - To 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 - To explain that we see things because light

				protect their eyes • To recognise that shadows are formed when the light from a light source is blocked by a solid object • To find patterns in the way that the size of shadows changes.			travels from light sources to our eyes or from light sources to objects and then to our eyes • To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Forces				• To compare how things, move on different surfaces • To notice that some forces need contact between 2 objects, but magnetic forces can		• To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • To identify the effects of air resistance, water resistance and friction,	

				act at a distance • To observe how magnets, attract or repel each other and attract some materials and not others • To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • To describe magnets as having 2 poles • To predict whether 2 magnets will		that act between moving surfaces • To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	
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				attract or repel each other, depending on which poles are facing.			
Electricity					• To identify common appliances that run on electricity • To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • To identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp		• To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • To 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 • To use recognised symbols when

					is part of a complete loop with a battery • To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • To recognise some common conductors and insulators, and associate metals with being good conductors.		representing a simple circuit in a diagram.
Sound					• To identify how sounds are made, associating some of them with something vibrating		

					• To recognise that vibrations from sounds travel through a medium to the ear • To find patterns between the pitch of a sound and features of the object that produced it • To find patterns between the volume of a sound and the strength of the vibrations that produced it. • To recognise that sounds get fainter as the distance from the sound source increases		
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Earth and space						• To describe the movement of the Earth, and other planets, relative to the Sun in the solar system - To describe the movement of the Moon relative to the Earth - To describe the Sun, Earth and Moon as approximately spherical bodies - To use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.	
Scientific Enquiry		• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests	• To asking relevant questions and using different types of scientific enquiries to answer them • To set up simple practical enquiries, comparative and fair tests	• To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • To take measurements, using a range of scientific equipment, with increasing accuracy and precision			

		• identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	• To make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • To gather, recording, classifying and presenting data in a variety of ways to help in answering questions • To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • To identify differences, similarities or changes related to simple scientific ideas and processes • To use straightforward scientific evidence to answer questions or to support their findings.	• To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graph. • To use test results to make predictions to set up further comparative and fair tests • To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations • To identify scientific evidence that has been used to support or refute ideas or arguments.
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Unit Planning

Understanding the World

EYFS UfW Educational Programme

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them - from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Children in Foundation will be learning to (Development Matters):

- Draw information from a simple map.
- Recognise some similarities and differences between life in this country and life in other countries.
- Recognise some environments that are different from the one in which they live.
- Understand the effect of changing seasons on the natural world around them.
- Talk about members of their immediate family and community.
- Name and describe people who are familiar to them.
- Comment on images of familiar past situations.
- Compare and contrast characters from stories, including figures from the past.
- Talk about members of their immediate family and community.
- Name and describe people who are familiar to them.
- Understand that some places are special to members of their community.
- Recognise that people have different beliefs and celebrate special times in different ways.

Assessment:

- Listen to what the children say about what they see.
- Listen to how children communicate their understanding of their own environment and contrasting environments through conversation and in play.
- Do the children use new vocabulary? Can they; name specific features of the world, both human and physical?
- Look for children incorporating their understanding of the seasons and weather in their play.
- Listen to what children say about fictional and non-fictional characters from stories from a range of cultures and times.
- Are children beginning to develop and understanding of the past and present?
- Can children talk about people that they may have come across within their communities?
- Can they name and explain the purpose of places of worship and places of local importance to the community? Do they draw on their own experiences as much as possible?

- Explore the natural world around them.
- Describe what they see, hear and feel whilst outside.
- Recognise some environments that are different from the one they live in.
- Understand the effect of changing seasons on the natural world around them.

• Using new vocabulary, are the children able to describe their own lives and others around them?

- Can the children talk about and draw what they can see?
- Can children describe their environment? Can they comment on contrasting environment from books?
- Can they describe what changes in each season?

Early Learning Goals (Statutory)

Past and Present ELG

Children at the expected level of development will:

- Talk about the lives of the people around them and their roles in society;
- Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class;
- Understand the past through settings, characters and events encountered in books read in class and storytelling;

People Culture and Communities ELG

Children at the expected level of development will:

- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts, and maps;
- Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class;
- Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and - when appropriate - maps.

The Natural World ELG

Children at the expected level of development will:

- 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.

EYFS Science Skills & Knowledge

Biology

- Understand the life cycle of a human (baby, child, adult)
- Begin to understand the need to respect and care for the natural environment and all living things.
- Talk about the features of their own immediate environment and how environments might vary from one another.
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant (seed, shoot, flower)
- Understand the key features of the life cycle of animals such as chicks and butterflies.
- Identify similarities and differences in relation to living things
- Making observations and draw pictures of animals and plants in their familiar environment

Chemistry

- Observe and interact with natural processes;
- Melting and freezing different materials; ice, butter & chocolate when cooking, ice lollies in the summer.
- Materials; Name the material that we are using, think about its properties and select the right one for the purpose (Incy Wincy Spider Umbrella, Protecting Humpty Dumpty)

Physics

- Observe and interact with natural processes;
- Explore and talk about the forces that they feel.
- Seasonal changes and the effects on the world around us.
- An object casting a shadow
- A magnet attracting an object.
- Objects floating and sinking in water.
- Developing an understanding of growth, decay and changes over time - link to seasons (leaves fall off, plants grow)
- Understand the effect of changing seasons on the natural world around them.

Scientific Enquiry

- Using all of the senses, explore the natural materials around us.
- Look closely at similarities, differences, patterns and change
- Comment on the similarities and/or differences of the properties of the materials that we are familiar with.
- Talk about what we can see, using vocabulary we have learned.
- Comments and asks questions about aspects of their familiar world
- Explore how things work.
- Talks about why things happen and how things work
- Understand some important processes and changes in the natural world around them

Autumn Term

Spring Term

Summer Term

To name different parts of the human body

Christian Value: Respect for our bodies.

- I can name the different parts of my body.
- I know what I use the different parts of my body for.
- I know that I have bones in my body.

To name and understand the five senses

Christian Value: Respect for our senses.

- I can name the five senses.
- I know what each of these five senses do.
- I know which part of my body use for each of the five senses.

To know the signs of Autumn and the associated weather

Christian Value: Thankfulness for the seasons and the changes that they cause.

Compassion for the areas that are affected by severe weather conditions during these seasons.

Respect for the animals and their habitats.

- Using daily routines, discuss the weather and the season.
- Share information with the children about what happens during the Autumn.
- Whilst outside, ask the children to observe what is happening to the trees, plants and animals during this season.

To know the signs of Winter and the associated weather

Christian Value: Thankfulness for the seasons and the changes that they cause.

Compassion for the areas that are affected by severe weather conditions during these seasons.

Respect for the animals and their habitats.

- Using daily routines, discuss the weather and the season.
- Share information with the children about what happens during the Winter.
- Whilst outside, ask the children to observe what is happening to the trees, plants and animals during this season.
- Talk about the types of clothes that you need to wear during Winter

To know the signs of Spring and the associated weather

Christian Value: Thankfulness for the seasons and the changes that they cause.

Compassion for the areas that are affected by severe weather conditions during these seasons.

Respect for the animals and their habitats.

- Using daily routines, discuss the weather and the season.
- Share information with the children about what happens during the Spring.

To know the signs of Summer and the associated weather

Christian Value: Thankfulness for the seasons and the changes that they cause.

Compassion for the areas that are affected by severe weather conditions during these seasons.

Respect for the animals and their habitats.

- Using daily routines, discuss the weather and the season.
- Share information with the children about what happens during the Summer.
- Whilst outside, ask the children to observe what is happening to the trees, plants and animals during this season.
- Talk about the types of clothes that you need to wear during Summer.

To know the life cycle of a plant

Christian Value: Thankfulness for plants.
Respect when handling and taking care of plants.

- I can name the different stages of the life cycle of a plant.
- I can order the different stages of the life cycle of plant.
- I can recognise the different stages of the life cycle of a plant.
- I can talk about the changes I have noticed during this different life cycle.

- Talk about the types of clothes that you need to wear during Autumn
- Understand what hibernation means.
- To know which animals, familiar to us, hibernate.

To know how shadows are made

Christian Value: Perseverance to investigate how shadows are made.

- To understand what we mean by the terms 'light' and 'dark'.
- To know where light comes from.
- To be able to name different sources of light.
- To notice what happens when light is blocked.
- To know that a shadow is made when a light source is blocked.
- To experiment making shadows using different objects and parts of our body (shadow puppets)

To select a material based on its properties

Christian Value: Perseverance to investigate which material will be best to use.

- Understand what waterproof means.
- Think about any items of clothing we may have that is waterproof.

- Whilst outside, ask the children to observe what is happening to the trees, plants and animals during this season.
- Talk about the types of clothes that you need to wear during Spring.

To talk about the immediate features of our environment and how this compares to another environment we have learnt about

Christian Value: Respect for our environment.

Compassion for the animals and people who live in this environment.

- Using learnt knowledge about the Arctic and Antarctica, discuss any similarities and differences between these two cold places such as; weather & climate, animals who live there and people who live there.
- Compare this to where we live thinking about; weather & climate, animals who live there and the lives of the people, including houses and transport.
- Discuss global warming and the impact on polar regions

To know the life cycle of a human

Christian Value: Thankfulness for humans and the way that we change as we grow.

Respecting the changes that human go through.

To understand the importance of healthy eating.

Christian Value: Thankfulness for the food that we have.

Respect so that we don't waste the food we are lucky to have.

Compassion for people who are not as fortunate as we are to have the food that we have.

- To know the names of common fruit and vegetables.
- Talk about the fruit and vegetables we like to eat.
- To taste different types of fruit and vegetables.
- I know what healthy eating means.
- I know which foods are healthy and which foods are unhealthy.
- I can sort food based on whether they are healthy or unhealthy.
- I know how different foods help different parts of your body - calcium for teeth and bones etc
- I know the effects of unhealthy eating on my body. (Doctor/dentist visit?)
- I know who would help me if I was feeling unwell.
- I can make healthy eating choices.

To select a material based on its properties

- Think about the properties of an umbrella.
- Know how to work out which material will be best for Incy Wincy's umbrella.
- To know the names of the materials that you are testing.
- To talk and discuss what is happening to each material during the experiment.
- To select an appropriate material based on what you have noticed.

To show care and a respect for the animals that I would find in my local environment

Christian Value: Respect for our environment, the animals we see in our environment and their habitats.

- I can name some of the animals that I would find in my local environment (animals that the children will find around school or in their garden such as; birds, squirrels, hedgehogs, badgers, pets etc)
- I know some key features of the animals that I might find in my local environment
- nocturnal animals and what nocturnal means
- I understand why these animals are suited to this environment.
- I know how any changes in the environment in the environment will affect these animals - hibernation and bird feeders during winter.

- I can name the different stages of the life cycle of a human.
- I can order the different stages of the life cycle of human.
- I know how I have changed during my life cycle so far.

To know the life cycle of a butterfly

Christian Value:

Thankfulness for caterpillars and butterflies.

Respecting the changes that caterpillars go through to become butterflies.

- I can name the different stages of the life cycle of a butterfly.
- I can order the different stages of the life cycle of butterfly.
- I can recognise the different stages of the life cycle of a butterfly.
- I can talk about the changes I have noticed during this different life cycle.

To observe freezing (linked to Winter).

Christian Value: Perseverance to investigate freezing.

Thankfulness for the seasons and equipment that we have which allows us to explore freezing.

- I know what freezing means.
- I can name where I would put something that I wanted to freeze and give my reasons for this suggestion.
- I can talk about what has changed when I have frozen something.

Christian Value: Perseverance to investigate which material will be best to use.

- I understand the aim of my experiment - to protect Humpty Dumpty.
- I can name the materials that I am using for my experiment.
- I can make a prediction based on what I think will happen for each material.
- I can predict which material will be best.
- To talk and discuss what is happening to each material during the experiment.
- To select an appropriate material based on what you have noticed.

To observe freezing (linked to making ice lollies).

Christian Value: Perseverance to investigate freezing.

Thankfulness for the seasons and equipment that we have which allows us to explore freezing.

- I know what freezing means.
- I can name where I would put something that I wanted to freeze and give my reasons for this suggestion.
- I can talk about what has changed when I have frozen something.
- I know that freezing can be reversed.

-I know that freezing can be reversed.

To observe melting (linked to melting chocolate for Easter Rice Krispy cakes).

Christian Value: Perseverance to investigate melting.

Thankfulness for the seasons and equipment that we have which allows us to explore melting.

-I know what melting means.

-I can name where I would put something if I wanted it to melt and give my reasons for this suggestion.

-I can talk about what has changed when I have melted something.

-I know that melting can be reversed.

To show care and a respect for the animals in an environment that I have visited (linked to farm trip)

Christian Value: Respect for the environment, the animals we see in this environment and their habitats.

-I can name some of the animals that I can see in this environment.

-I can tell you something about each of the animals that I have seen in this different environment.

-I understand why these animals are suited to this environment.

-I can talk about how these animals are cared for in this environment.

To show care and a respect for the animals in a contrasting environment (Ocean animals)

Christian Value: Respect for the environment, the animals we see in this environment and their habitats.

-I can name some of the animals that I can see in this environment.

-I can tell you something about each of the animals that I have seen in this different environment.

-I understand why these animals are suited to this environment.

-I can talk about how these animals are cared for in this environment.

-I can talk about how I can care for these animals - link to recycling and World Oceans Day

Key Vocabulary

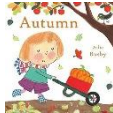
Science, experiment, test, fair, why, senses, world, plants, animals, humans, materials - waterproof, natural, change, growth, decay, environment, hibernate, nocturnal, life cycle, melting, freezing, ice, liquid, solid, human body parts, five senses

Key Texts

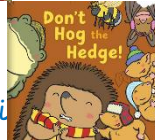
Funny bones by Janet and Allan Ahlberg



Autumn by Ailie Busby



Don't hog the hedge - Twinkl



Light in the night by Marie Voigt



Incy Wincy Spider

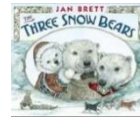
Winter by Ailie Busby



Spring by Ailie Busby



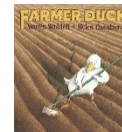
The three snow bears by Jan Brett



The Very Hungry Caterpillar by Eric Carle



Farmer Duck by Marin Waddell



Summer by Ailie Busby



Jasper's Beanstalk by Nick Butterworth and Mick Inkpen



Humpty Dumpty

Miss Polly had a dolly

Sharing a shell by Julia Donaldson



Classroom Provision, Enrichment opportunities & WOW moments

Ongoing opportunities throughout the year

- Daily weather and season through our daily routines
- Discussions about holidays/families from other countries. Weather in those countries.
- Exploring different gradients and speeds when racing cars down ramps. Using materials to change the speeds of cards and discussing 'friction'
- How sound travels through our class sound tubes.
- Exploring the change of properties of mud in the mud kitchen or sand in the sand tray. (Cause and effect)

- Using magnets to explore different magnetic and non-magnetic objects.
- Making rain catchers and comparing rain water over a period of time.

Autumn Term

Autumn walk

Animals and their habitats. What animals might we find in our garden? What animals might we see around school? Around our local area?

Animals that hibernate - visit from Mrs Fox with her tortoise.

Making bird feeders

Spring Term

Winter walk

Spring walk
Visit from Mrs Fox - tortoise coming out of hibernation

Caterpillars in the classroom

Animals and their habitats. What animals might we see at the farm? (School trip)

Planting seeds (Mother's Day)

Summer Term

Summer walk

Making healthy fruit kebabs.

Animals and their habitats. What animals might we see in the Ocean or at the seaside?

Seaside Day

Sinking and floating - related to seaside learning

Year 1 Plants *Biology*

Knowledge to be taught:

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- identify and describe the basic structure of a variety of common flowering plants, including trees

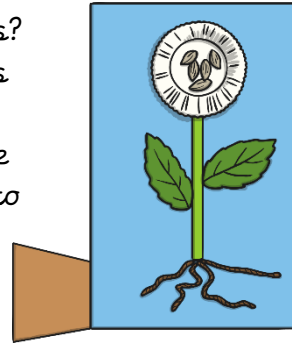
Lesson Guide

1. *What are the parts of a flower?*

Key Vocabulary

Flower, leaf, petal, seed, stem, root

Show the children a picture of a flower or get a small plant which you can pull out of soil to show the roots and seed. Do you know any parts of the flower? Children to learn what the different parts of a flower are - petal, stem, leaf, root and seed. What are the jobs of the different parts? Flower attracts bees and insects. Stem holds the plant up. Leaves catch sunlight to make energy. Roots take in water and nutrients from soil. Seed grow into new plants. Discuss that we should be **thankful** for the plants around us as they give us life. Children to create their own flower using green straws, sunflower seeds, real leaves, brown wool cupcake cases, blue and brown card. Children to add the labels flower, stem, root, seed and leaves to their created flower.



Scientific enquiry - Explore the world around them and raise their own simple questions

LO: identify and describe the basic structure of a variety of common flowering plants.

Christian Value: **thankfulness**

2. What are the parts of a tree?

Recap parts of a flower. What do you know about a tree? Go outside into the garden to look at the trees. What do you think is underground? Link that it is the same as a flower. Are the roots going to be bigger or smaller than a flower? What holds the plant up? Go through the trunk, branches, leaves and roots. What is a tree made of - discuss the bark. What does the bark feel like? Children to draw a tree and label the different parts.

Scientific enquiry - Explore the world around them and raise their own simple questions

LO: identify and describe the basic structure of a tree.

3. We're going on leaf hunt - what will we find?

Good video - Hey Duggee - the tree badge (season 3 episode 9) After watching the video - How do we know trees are alive? - roots collect food for the tree, roots suck up water from the soil, bark protects tree, animals live in trees, trees give us fruit, berries, nuts, leaves catch the sunlight and cleans the air to help us breathe, food for animals, shelter from rain and sun. Show the children some pictures of

Deciduous, evergreen, branch, branches, bark, trunk,

(Ash, horse chestnut, pine, sycamore, holly, hawthorn)

Names of locally found wild plants
Daisy, buttercup, dandelion etc...

trees - see key vocabulary. Do they know what any of them are? Discuss with the children the two types of trees, deciduous and evergreen trees. Identify that a deciduous tree sheds its leaves at the end of a season. Evergreen trees keep their leaves. If deciduous trees shed their leaves what happens to them? - they change colour and fall off. Go on a leaf hunt around the school grounds. Collect both evergreen and deciduous leaves. Bring leaves to classroom. Children to sort leaves into the two groups and take photos. Discuss the shape of the leaves and match to the trees in key vocabulary. Discuss how we can **respect** and look after our local environment.

Scientific enquiry - Explore the world around them and raise their own simple questions. Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: To identify and name a variety deciduous and evergreen trees

Christian Value: **respect**

3. What can affect how a plant grows?

Show the children a bean, watering can, soil and pots. What could we do with this equipment? What could we find out? Use question words how, when why or what. Children to learn that plants need the right conditions to grow well. What could we investigate? - what happens if we don't put any soil in? what will happen if we don't give it any water? What will happen if we leave the bean in the dark? All children to plant a bean. Beans to be placed in different places to answer these questions. Children to draw method and write prediction. I predict the plant will grow well if it has water and soil because plants need food and water to grow. Children to understand that it takes patience and **perseverance** to wait for a plant to grow.

Scientific enquiry - Begin to recognise different ways in which they might answer scientific questions Carry out simple tests. With guidance, they should begin to notice patterns and relationships

LO: To investigate what a plant needs to grow.

Christian Value: **Perseverance**

4. What can affect how a plant grows? - this may take several weeks for the bean to grow.

Let's look at the plants. Which have grown well? Why? Children to learn the conditions needed for a plant to grow well. Children to record what they can see in a table and write a conclusion. E.g. I found out that a plant needs water and sun to grow. This plant grew the most. Remind the children how we need to be **thankful** for what the plants give us.

Scientific enquiry - Use simple measurements and equipment (e.g., hand lenses, egg timers) to gather data. Record simple data. Use their observations and ideas to suggest answers to questions

LO: To measure a plant using a ruler. To say what three things a plant needs to grow well - soil, water, sun.

Christian Value: **thankfulness**

5. **What flowers are in our local environment?**

Children to learn what common wild plants are - dandelions, buttercups, daisies clover, nettles and brambles. A wild plant is a plant that grows all by itself. It grows where the seed falls. It doesn't need to be planted or cared for. Sometimes they are called weeds. Children to learn about common garden plants. Garden plants are plants that people grow. They are grown as they are nice to look at or for food. What have the children planted? Look at e.g. sunflowers, sweet peas or other fruits and vegetables, tulips, daffodils, pansy, clematis, fuchsia, rose. Go on a plant hunt. Children to take photos or create a tally chart of the different plants they find and label what they are on Seesaw. Discuss that we don't pick flowers from peoples gardens out of **respect**.

Scientific enquiry - With help, they should record and communicate their findings in a range of ways and begin to use scientific language. Observe closely using simple equipment

LO: To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees

Christian Value: **respect**

Feedback:

Year 1
Animals, including humans
Biology

Knowledge to be taught:

- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- identify and name a variety of common animals that are carnivores, herbivores and omnivores
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

Lesson Guide	Key Vocabulary
1. <i>What are the parts of the human body?</i> Children to draw around a friend in groups showing the Christian value of <i>friendship</i>. Ask the children to label on any body parts they know. Play Simon say with the children and children to learn Ankles, arms, back, body, chest, ears, elbows, eyebrows, eyelashes, eyes, face, feet, fingers, hair, hands, head, hips, knees, legs, mouth, nails, neck, nose, shoulders, teeth, thigh, toes, tongue, waist, wrist. Each of our body part has its own special job to do. What is the function of our legs? Feet? Neck? Etc. Go through some of the body parts above. Children to either draw a picture of a human and label the parts of the body they know using a word bank or give them a human body to label. <i>Scientific enquiry - With help, they should record and communicate their findings in a range of ways and begin to use scientific language</i> <i>LO: identify, name, draw and label the basic parts of the human body</i> (Assessed LO) Christian Value: <i>friendship</i>	Ankles, arms, back, body, chest, ears, elbows, eyebrows, eyelashes, eyes, face, feet, fingers, hair, hands, head, hips, knees, legs, mouth, nails, neck, nose, shoulders, teeth, thigh, toes, tongue, waist, wrist Hear, loud, quiet, see, senses, smell, sound, taste, touch, Amphibian, badger, birds, black bird, calf, cat, chicken, cow, deer, dog, donkey, duck, elephant, fish, fox, frog, giraffe, goat, guinea pig, hamster, horse, lion, monkey, mouse, mammals, ostrich, penguin, reptiles, shark, sheep, snake, squirrel, swan, tiger, zebra Carnivore, omnivore, herbivore
2. <i>What are our senses?</i> Simon says recap of the body parts. Show an image on the board. It can be anything. Ask questions relating to what they can see. E.g. which child is wearing the red top? What is the dog doing? Play a sound e.g. traffic. What is making the sound? What do you think is happening? If you were standing near to the noise, what would you need to be careful of? Children to learn that they have just identified two of their senses - hearing and sight. What are the other three senses?	

Children to learn that they are smell, touch and taste. Our sense help us understand the words and they also help keep us safe. This week the children will focus on sight and hearing. Identify that we use our eyes to see and our ears to hear. What can they see? Go around the school. What can they hear? Could use musical instruments. What instrument is playing? Children to record using words, sentences or pictures what they could see and hear. Discuss that if one of our senses doesn't work your other senses work harder. Show them a clip for Strictly Come Dancing. She is deaf so how does she 'hear' the music? Touch - the vibrations of the floor. Showing the Christina Value of **respect** - we **respect** others are different to ourselves and are **compassionate** to those with disabilities.

Scientific enquiry - Carry out simple tests

LO: Identify which part of the body is associated with each sense

(Assessed LO)

Christian Value: **respect and compassion**

3. What can we taste, touch and smell?

What are the five senses? Which two have we looked at so far? What do we use to see? What about hear? Children to learn about taste, touch and smell. What parts of the body do we use for these senses? Children to explore these senses by taking part in a carousel of activities. Feeling boxes for touch, boxes for smelling different items and blindfold tasting. Children to show the Christian value of **truthfulness** and not peek at looking at what is in the feely boxes. Children to record in a table what they think it is? Go through the answers as a class discussing the children's thoughts.

Scientific enquiry - Explore the world around them and raise their own simple questions. Experience different types of science enquiries, including practical activities

LO: Identify which part of the body is associated with each sense

(Assessed LO)

Christian Value: **truthfulness**

4 What are the five animal groups?

Show the children pictures of a variety of animals. What are they? Make sure the animals that you show them are either birds, mammals, reptiles, amphibians or fish. Give the children copies of the animals. How could you sort them? Children

to learn name of the different type of animals - mammals, birds, amphibians, fish and reptiles. Go through which animal is in which group. Where would you find each of these groups of animals e.g. fish in water. What animals do we have living near us? What don't we have? Why? Children to name the different common animals e.g. penguin, polar bear, fish, dog, lizard, frog. How can we protect or look after these animals? - link to the environment and Christian value of **respect**.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

Christian Value: **respect**

5 Can I compare two animals?

What are the five different types of animals from last time - amphibian, mammal, fish, bird and reptile. Can you think of an animal that belongs in...? group? Go through a selection of animals from last time. What groups are they in? Children to learn the features that make an animal belong in its group. Give them a picture of an animal, e.g. dog. What features does a dog have? - fur, 4 legs. repeat with other animals one from each group. Now let's think about the features of a bird. Do all birds have the same features? Give children two pictures - a robin and a penguin. Children to annotate the features of each animal. How are they the same? How are they different? Provide children with two or three animals from each group. How are they different? How are they the same? Think about the Christian value of **respect** in that no two living things are the same. E.g. reptile - tortoise, snake, crocodile. Amphibian - frog salamander. Mammal - monkey, dog, human. Fish - clown fish, puffer fish, angelfish. Children to record results in a table.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) Record simple data. Use their observations and ideas to suggest answers to questions

LO: to describe and compare the structure of a variety of common animals including pets

(Assessed LO)

Christian Value: <i>respect</i>	
<i>6 How can we classify animals?</i> Recap the five different animal groups. What do all birds have in common? Mammals? What is different? Children to learn that all living things eat, and this is called an animal's diet. Show the children different animals. What do they eat? E.g. lion, shark, tortoise, robin. Children to learn that animals' diets can be sorted into three groups - herbivore, omnivore and carnivore. Go through what each mean. What are humans naturally? Give the children some common animals and ask them to sort into the three groups. Can use secondary sources to find the answers if unsure. How many different ways can they do it? - <i>persevere</i> with finding more than one way. Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Ask people questions and use simple secondary sources to find answers LO: identify and name a variety of common animals that are carnivores, herbivores and omnivores (Assessed LO) Christian Value: <i>Perseverance</i>	
Feedback:	

Year 1 Everyday Materials <i>Chemistry</i>	
Knowledge to be taught: - distinguish between an object and the material from which it is made - identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock - describe the simple physical properties of a variety of everyday materials - compare and group together a variety of everyday materials on the basis of their simple physical properties	
Lesson Guide	Key Vocabulary

1. What is it?

Provide the children with a variety of raw materials - wood, plastic, glass, metal, water and rock. What do they know about these materials? Do they know what they are called? Children to learn the vocabulary wood, plastic, glass, metal water and rock. Can they match the different raw materials to the material name? what words could we use to describe these materials? Christian value of **respect-respecting** the materials so they aren't damaged. (Especially the glass.) Children to think of adjectives to describe them. Children to learn that these words are the properties of the materials. Children to thought shower the properties of each materials. Could do on post it notes next to corresponding materials. Take photos for Seesaw.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language.

LO: identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock

Christian Value: **respect**

2. What is it made from?

Provide the children with a variety of materials - wood, plastic, glass, metal, water and rock. Ask the children to sort the objects. How have they done it? What do we mean by the word material? - what something is made from. Children to learn that objects are made of different materials. What materials are they made from? Children to learn the vocabulary wood, plastic, glass, metal water and rock. If able extend to the vocabulary in the key vocab list. Can they see any more objects made from any of these materials around the classroom? Can they think of anymore that they can't, see? Children to take photos of different objects of each of the groups, could add their own by writing on post it notes and then label each group using a post it notes. Christian value of **friendship** - working with a partner.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and

Brick, card, cardboard, clay, fabric, glass, material, metal, plastic, rubber, wood, wool Elastic, manmade, manufactured, natural, paper, rock, foil

Absorbent, bendy, tears, dull, shiny, hard, liquid, magnetic, object, opaque, transparent, see through, rough, smooth, soft, solid, stiff, stretchy, strong, twist, waterproof

classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language.

LO: To distinguish between an object and the material from which it is made

Christian Value: *friendship*

3. Can you describe the materials?

What properties did you think of to describe materials in the first lesson? Children to learn Absorbent, bendy, tears, dull, shiny, hard, liquid, magnetic, object, opaque, transparent, see through, rough, smooth, soft, solid, stiff, stretchy, strong, twist, waterproof. Which words do they know? Which don't they know? Show the children some materials. Model how to test for transparency and if their waterproof. Provide the children with a selection of materials. What do they look like? How do they feel? Which words would you use to describe them? Hold up one that is e.g. bendy? Hard? Stretchy? Transparent? Using feely bags children to describe a material using the property vocabulary. can their partner work out which material they are describing? Children to explore themselves transparency and absorbency. Christian value of *friendship* - working with a partner. Children to use a word bank and label properties of selected materials. Differentiate vocabulary. Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language.

LO: To distinguish between an object and the material from which it is made

(Assessed LO)

Christian Value: *Perseverance, thankfulness, truthfulness, compassion, respect, friendship*

4. What are the properties of these materials?

How many different properties can you remember? Children to learn whether a material is opaque, waterproof, transparent, absorbent by testing materials/objects. E.g. rubber gloves, wellies, cardboard box, towel. Children to record the object, the material that it is made from and if it is waterproof/not waterproof, transparent/opaque, absorbent/not absorbent by testing their given objects. Work in a team - *friendship* - to find the materials properties. Record results in a table

Scientific enquiry - Carry out simple tests. Record simple data. Begin to recognise different ways in which they might answer scientific questions

LO: To describe the simple physical properties of a variety of everyday materials
(Assessed LO)

Christian Value: *friendship*

5. What material could you use to make earmuffs? (Not fur)

Linking to our season's unit - what does winter weather feel like? What sort of weather do we have? What may we need - hat, gloves. Children to learn who the scientist Chester Greenwood was and what he invented - earmuffs. Identify that we should be *thankful* for his invention. Pose the question what material could you use to make earmuffs? Tell the children that have got to find an alternative material to Chester, so they are not allowed to use fur. Children to learn that to conduct the experiment they will wrap a material around a small jar of hot water (you could use jam jars or the glass bottles from the science cupboard) Leave the jars for 5 mins. Then at the end of the 5 minutes test the temperature of the water to see which kept the water the warmest. Children could use tinfoil, bubble wrap, towel, kitchen roll, paper, cling film fabric etc. Before the experiment children to write a prediction. Which do they think will keep the water warmest and why? - I predict the fabric will keep the water the warmest as it is thick. Conduct the experiment. Which material kept the water the warmest? Children to write conclusion - I found out that Would be a good material to make earmuffs because it kept the water the warmest.

Scientific enquiry - With help, observe changes over time. Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out

LO: compare and group together a variety of everyday materials on the basis of their simple physical properties

Christian Value: *thankfulness*

6 Who invented Lego?

Children to learn who scientist Ole Kirk Christiansen was and what he invented - Lego. Identify that we should be *thankful* that Lego was invented. Who has played with Lego? What is it made from? Why do you think it is made of plastic? Watch

<https://www.youtube.com/watch?v=wnRRDIFNxoM> to see how Lego is made. Why didn't Ole Kirk Christiansen use metal, wood or glass to make Lego? Children to explore Lego pieces and identify the different properties using the vocabulary from the key vocab box. Children to think and answer - why is plastic the perfect material for Lego? Why does Lego need to be lightweight? Why is it useful for Lego to be hardwearing?

Scientific enquiry - Use their observations and ideas to suggest answers to questions. With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: To name and identify the material that Lego is made from. To observe and describe the properties of the material Lego is made from.

Christian Value: *thankfulness*

7 What material would make the best umbrella for Ted?

Poor Ted has gotten wet while playing in the garden. What could he use to stop this happening again? - umbrella. Pose the question - what material would be the best one to make an umbrella for Ted? Children to show *compassion* - we wouldn't want Ted to get wet, as we wouldn't like to get wet. What property are we looking for? How could we test these materials? Children to choose materials that they would like to test. Children to write a prediction. I predict that Will make a good umbrella because ... is waterproof. Children to draw the method and label - put Ted inside a beaker. Put material over top of beaker using an elastic band. Drop water onto the material using a pipette. Observe and record results. Repeat with other materials. What did you find out? Write conclusion - I found out that ... was a good material as Ted didn't get wet.

Scientific enquiry - Perform simple tests. With help, observe changes over time. Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out

LO: To identify which material would be best to make an umbrella.

Christian Value: *compassion*

Feedback:

Year 1
Seasonal Changes
Physics

Knowledge to be taught:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

Lesson Guide

1. What is Autumn?

Children to learn that there are four seasons - autumn, spring, summer and winter. What months are associated with each season? Autumn - September, October, November. Winter - December, January, February. Spring - march, April, May. Summer - June, July, August. What season are we in now? - autumn. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-animals-preparing-winter-storing-food-migrating-hibernating/z6h6nrd> What happens to the weather in autumn? It gets cooler. What clothes do you need to wear? Coat. Link to Christian value of **thankfulness** that we have the correct clothing to wear for the season of autumn. What happens to the environment around us during autumn? Conkers, harvest, leaves falling from trees, scrumping. Go on an autumn walk and pick a tree that isn't evergreen. This will be the tree for the year to observe how it changes throughout the seasons. Show the children a season wheel. For this session the children will only complete the autumn section. The rest will be done at various stages throughout the year when the season changes. Children draw the tree in a season wheel.

Scientific enquiry - Explore the world around them and raise their own simple questions. With help, observe changes over time.

LO: To observe changes across Autumn.

(Assessed LO)

Christian Value: **thankfulness**

2. What is winter?

Children to learn about the season of winter. What physical changes can you see? How has the environment around us changed since autumn? - no leaves on trees

Key Vocabulary

Autumn, day, month, temperature, weather, time

Dark, hail, sleet, snow, winter, night, wind

Months of the year, times, day length, dawn, sunrise and sunset, day and night

Spring, rainfall, dawn and dusk, sunrise, sunset

(except evergreen trees - linked with plants lesson) How has our clothing changed - hats gloves scarves. Link to Christian value of **thankfulness** that we have the correct clothing to wear for the season of winter. Temperature? Are we still able to easily get some food e.g. strawberries? Why not? - not seasonal food What months are in winter? - December, January and February. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-winter-weather-behaviour-british-animals-plants/zbcg92p> Go on a winter walk. Go back outside to look at the tree from the autumn lesson. Children to draw the tree in their season wheel in the winter section. How is it different from autumn? What happens to some animals during winter? Talk about hibernation (animals find a safe place and fall into a deep sleep because winter is too cold and hard to find food), migration (travelling to another place where the weather is warmer, so it is easier to find food,) and gathering of food so they have food to eat during winter months. Which animals belong in each category?

Scientific enquiry - Explore the world around them and raise their own simple questions. With help, observe changes over time.

LO: observe changes across the Winter seasons.

(Assessed LO)

Christian Value: **thankfulness**

3. What is spring?

Children to learn how spring differs from autumn and winter. Recap what months are in spring. What can we see in the world around us at the moment that we should be **thankful** for? New life - lambs being born, eggs hatching, grass growing, daffodils, snow drops, leaves on the trees. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-seasonal-changes-behaviour-animals-growth-cycle-plants/zfyrvk7> Go on a spring walk. What evidence is around us to show that the season has changed? Have a look at the tree. Draw in the spring section of their season wheel. Now we are in spring what has happened to the temperature? What is the weather like? What clothes are you wearing?

Scientific enquiry - Explore the world around them and raise their own simple questions. With help, observe changes over time.

LO: observe changes across the Spring seasons

(Assessed lo)

Christian Value: *thankfulness*

4 What is summer?

Children to learn about the season of summer. Watch

<https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-how-summer-weather-affects-behaviour-of-british-animals-plants/zkdkjhr> How has our environment changed as we've moved into summer? What has happened to the weather?

Temperature? What clothing are we now wearing? Go on a summer walk and look at the trees. What does it look like now? What can we see in the world around us at the moment that we should be *thankful* for? Complete season wheel. What changes have occurred as we have gone through the seasons? Children to record either using pictures or sentences the changes that they can remember. E.g. in spring we get lambs. In autumn the leaves fall off the trees. Assess the children's understanding of the seasons.

Scientific enquiry - Explore the world around them and raise their own simple questions. With help, observe changes over time.

LO: *observe changes across Summer*

(Assessed LO)

Christian Value: *thankfulness*

5 Can the length of a day change?

Month	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug
Hours of sunlight	13	11	9	8	8	10	12	14	15	16	16	14

Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-british-plants-animals-and-landscapes-through-the-four-seasons/z4vjmfr> as it shows how the world adapts throughout the year with regards to the changes of seasons.

Children to learn that as autumn turns to winter the days get shorter and the nights get longer and as the spring turns to summer the days get longer and the nights get shorter. Discuss how in the winter we walk up and it's dark and it's

dark when we go to bed. In the summer it is light in the morning and at bedtime.

Look at

What do the children notice about the hours of sunlight throughout the year?

Children to use the data from this table to create a bar graph. Children to answer questions on what it shows. For example, which season has the longest days?

Which has the shortest day? Christian value of thankfulness - we are *thankful* for the world we live in.

Scientific enquiry - Talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: *observe and describe weather associated with the seasons and how day length varies*

Christian Value: *thankfulness*

6 How can we stay safe in summer?

What do you do outside in the summer? What do you wear? Children to learn that the sunshine is lovely because it means it is warmer and they can play more outside, however they need to be safe in the sun because sun rays are invisible and can cause us damage. They can cause sunburn and damage eyes, so we have to protect ourselves by *respecting* our bodies. How could we do this? Sun cream, hat, sunglass, water, shade. Children to learn why we use each of these e.g.

sunglass protect eye from invisible sun rays, sun cream protects from sunburn.

Why do we need shade between 11 and 3? - it is the hottest part of the day.

Children to create a poster showing how we can keep safe in the sun.

Scientific enquiry - Begin to recognise different ways in which they might answer scientific questions. Talk about what they have found out and how they found it out

LO: *observe and describe weather associated with the summer season*

Christian Value: *respect*

Feedback:

Year 2
Living Things and their Habitats
Biology

Knowledge to be taught:

- 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

Lesson Guide

1. What are the seven life processes?

WE HAVE TAUGHT THIS I YEAR 3. IF YOU WOULD LIKE ALL OUR RESOURCES/SMART LET ME KNOW 😊

Children to learn the seven-life process. Watch

<https://www.bbc.co.uk/bitesize/clips/ztbw2p3> How do we know something is alive?

Look at the mnemonic MRS GREN. Children to learn that each letter represents a different life process. For something to be alive it has to have all these life process. Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition. Children to use DKFindout <https://www.dkfindout.com/uk/animals-and-nature/what-is-living-thing/> to research and complete a thinking frame or poster on the seven life processes. Highlight that we need to **respect** all living organisms as they are all important and be thankful for the world, we live in.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify the seven life processes.

Christian Value: **respect, thankfulness**

2 What am I?

Show the children pictures of some common animals e.g. dog, cat rabbit giraffe etc. Move onto some more unusual animals which they may not know - e.g.

Key Vocabulary

Alive, dead, never been alive, living, non-living

Desert, artic, ocean, environment, rainforest, jungle, habitat,

Damp, wet, dry, cold, cool, hot, warm, conditions, dark, light, adaptation

Herbivore, carnivore, omnivore, Food chain

badger, fox, porcupine, puffin, whale. Children to look through the pictures and sort into animals they know and those they don't. Go through as a class. In books/seesaw, children to identify three new animals they have learnt. Can they research any facts about them e.g. where they live, food they eat.

LO: To name different animals

3. Can you classify objects into those that are living, dead or that has never been alive?

Children to learn the difference between something that is living, dead or has never been alive. Start by watching

<https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zs73r82> So how do we know something is alive? Recap seven life process (MRS GREN) - movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. For something to be a living organism they do all these. Go through what each of these mean. What do we mean by something that is dead e.g. fallen leaves? Can they think of anymore? These objects, when alive we are doing the seven life processes. Link to the Christian value of **thankfulness** - **thankful** for the world that we live in. What do we mean by something that has never been alive? Can they think of some examples? Provide the children with a variety of objects or pictures (for living things) Ask them in pairs or small groups (Christian value of **friendship**, working together) to sort the objects into living, dead and never been alive. Children to then pick one item from each category and explain how they know it is living, dead or has never been alive. How are they different?

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: To explore and compare the differences between things that are living, dead, and things that have never been alive

(Assessed LO)

Christian Value: **thankfulness**, **friendship**

4. What habitat is in our local environment?

Children to learn that a habitat is the home of a living thing. Look at some pictures of different habitats, e.g. beach, forest, Arctic, ocean, savannah. What living organisms would live in these habitats? Animals? Plants? Why do animals

not all live in the same habitat? They live in one that is suited to them. They need a specific habitat so they can find food and water, space to move, grow and reproduce, air or oxygen and shelter and safety. Go through some examples of why living things live in habitats that they are suited. E.g. A fish can't live in the woods as it wouldn't be able to breathe, swim, have safety or food etc. Think about how we can protect these habitats and show *respect* to nature - if we don't some living organisms would not survive. What habitats are around school? Rocks, grass, trees, logs. Identify that these are microhabitats. What animals would we find living there? Pose the question - how many minibeasts are in our school garden? Record results using a tally chart. Children to then use this information to create a pictogram.

Scientific enquiry - Record simple data Experience different types of science enquiries, including practical activities Explore the world around them and raise their own simple questions

LO: identify and name a variety of plants and animals in their habitats, including microhabitats

Christian Value: *respect*

5. *What habitats are in the world and what lives there?*

We have looked at the microhabitats in the school garden. What habitats are around the world and what animals/plants live there? Look at world habitats - rainforest, Arctic, ocean and desert. Do polar bears live all over the world? Why not? Discuss that they are suited to their environment. Watch <https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/z3sr4wx> discuss what they have noticed about the animals in these cold climates. Children to make notes on what they have learnt. Ask the children which habitats they would like to learn about more minimum of four - see below and watch the relevant videos. Watch the videos below about ocean

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zsfkd2p>), woodland

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zc42xnb>), rainforest

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zxdsrvcw>) an urban

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zw2syrd>) desert

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zsqnfg8>) coastal

(<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zy38wmn>)

<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zt4kqt> pond habitat.

Children to make notes about how animals are suited to their specific environment. Using the notes they have written children to create a fact file identifying animals and their features in three of the habitats learnt. How can we protect these animals - Christian value of respect and compassion.

Scientific enquiry - Ask people questions and use simple secondary sources to find answers

LO: 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

(Assessed LO)

Christian Value: compassion, respect

6 What are herbivores, omnivores and carnivores?

What do animals need to survive - water air shelter and food. Children to learn that some animals get their foods from plants, some from animals and some from both. What is an herbivore - plant eater? What examples can you give of what they eat? What is a carnivore? A meat eater. What animals are carnivores? What do they eat? What is an omnivore - an animal that eats both plants and meat. What examples can you think of - humans. Watch

<https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/z96vb9q> Go through different animals asking the children if they are herbivores, omnivores or carnivores - sheep, cat, worm, bear. Give the children a selection of animals. Make sure they state what they eat. Children to sort the animals into a Venn diagram. Explain to the children that on one side will be carnivorous animals, the other herbivores. What will go in the middle? Omnivores. Why? - because they are both meat and plant eaters. Talk about how to humans we omnivores are; however, some people choose to be a vegetarian, other diets are influenced for religious reasons, and it is our job to respect other people feelings and beliefs towards foods.

Scientific enquiry - With help, they should record and communicate their findings in a range of ways and begin to use scientific language. Use simple features to

compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: 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.

(Assessed LO)

Christian Value: *respect*

7 What is a food chain?

Children to recap seven life processes. Children to learn that nutrition is all about food and that all living things need food to survive. Foods give us energy. Green plants make their own food using sunlight, water and air. Animals are not able to make their own food. How do animals get their food? Some animals get food from plants. What are they called - herbivores. What plants could herbivores eat - cow eats grass. Some animals get their food by eating other animals. What are they called - carnivores? What meat could be eaten? Some animals get their food by eating both plants and animals. What are they called - omnivores. What different foods could they eat? Children to learn what a food chain is - it shows how each animal gets its food. Food chains are one of the ways living things depend on each other to stay alive. We need to *respect* animals so and not over fish or over hunt as we could disrupt some food chains. This could lead to endangered animals or even extinction. Watch

<https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/z3c2xnb> Show a diagram of a food chain. E.g. caterpillar - bird - cat. Make sure arrows are used. Which animal is eating which? Give the children a set of animals and ask them to use them to create food chains.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying).

LO: To create a simple food chain, and identify and name different sources of food. (Assessed LO)

Christian Value: *respect*

Feedback:

Year 2
Plants
Biology

Knowledge to be taught:

- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Lesson Guide

1. *What plants are in our local environment?*

Children to identify common plants that are grown in the wild - recap from year 1 - daisies, buttercups, dandelions, needle, bramble, ivy, clover etc. Can they remember what they are called by looking at pictures? Repeat with garden plants - grass, rose, sunflower, poppy, lily, fuchsia What about trees - deciduous and evergreen, oak, sycamore. Can the children recall the parts of a flower - root, leaves, stem flower. Recall the parts of a tree - roots, trunk, branches, leaves. What plants and trees are in our local environment? Children to go on a nature walk to find the plants and trees that are in the school garden / local environment. What did they find? Take photos to compare at the end of the year. Draw and label trees and flowers found. Christian value of *thankfulness* for nature and wildlife. Discuss how we need to *respect* these living things by not standing on them, picking or damaging them.

Scientific enquiry - Explore the world around them and raise their own simple questions. With help, they should record and communicate their findings in a range of ways and begin to use scientific language.

LO: *observe and describe mature plants. (Identify and name a variety of plants and animals in their habitats - living things and their habitat's objective)*

Christian Value: *thankfulness, respect,*

2. *What do plants need to grow and stay healthy?*

Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-do-plants-need-to-survive/zkw2gwx> Children to learn that to grow

Key Vocabulary

Habitat, microhabitat, grass, pond, woodland, under log, under bushes, Grow, plants, bulb, soil, shoot, water, light, Fully grown, survival, die, temperature, light, water, dark, Germinate, germination, seedling, shoot, grow, mature plant, Damp, wet, dry, dark, light, hot, warm, cool cold, temperature, water, germinate

and stay healthy plants need water, sun and the correct temperature. Children to plant either seeds or bulbs e.g. daffodils. Tell the children that four experiments will be set up - water and no light, light but no water, no water or light and water and light. Children to predict which plants will grow and be the healthiest. Set up experiment. Children to look after plants according to the experiment and monitor what happens over the coming weeks. Christian value of **perseverance** as children will have to be patient to wait for plants to grow.

Scientific enquiry - With help, observe changes over time. Use their observations and ideas to suggest answers to questions

LO: find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

(Assessed LO)

Christian Value: **Perseverance**

3. What do plants need to grow and stay healthy?

Children to recap the experiment they set up. What are you trying to find out? What conditions have you put your plants in? Bring all the plants together. What has happened to the plant? Which have grown? Which look healthy? How tall are the plants? So what do plants need to grow well and stay healthy? - water and light. Children to write a conclusion on what they have found out.

Scientific enquiry - With help, observe changes over time. Use their observations and ideas to suggest answers to questions

LO: find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

(Assessed LO)

Christian Value: **Perseverance**

4 How has our garden grown?

Look back at the pictures taken in lesson 1. Go to the school garden. How have the plants grown/changed? Take photographs and annotate on Seesaw the changes.

Scientific enquiry - With help, observe changes over time. Use their observations and ideas to suggest answers to questions

LO: To describe main changes as seeds and bulbs grow into mature plants.

Feedback:

Year 2
Animals including Humans
Biology

Knowledge to be taught:

- 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

Lesson Guide

Key Vocabulary

1. *What do animals need to survive?*

Children to discuss and thought shower what they think animals need to survive. Watch <https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zx38wmn> Children to learn that animals need air, water, shelter and food to survive. We need to be *thankful* that we have all these things. What would happen if animals didn't have these things? Children to create a poster on what animals need to survive.

Scientific enquiry - With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: To find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

(Assessed LO)

Christian Value: *thankfulness*

2. *Can you help Florence improve her diet?*

Children to be given a selection of pictures of foods. Ask the children to sort them. How have you done it? Could you do it another way? Could be sorted into healthy/unhealthy, foods they like/dislike, fruits and vegetables. Children to learn that there are five food groups - carbohydrates, protein, dairy, fats and sugars and fruits and vegetables. Read Florence was No Ordinary Fairy.

<https://www.youtube.com/watch?v=8RHJdYSmXQ> What is the problem in the story?

Children to become dietitians and create a meal plan for Florence - a breakfast,

Survival, health, breathing, air, water, food

Balanced diet, bread, rice, potato, pasta, dairy, fats, sugars, fruits and vegetables, meat, fish, eggs, beans, unhealthy, healthy, milk,

Exercise, breathing, heart, oxygen, experiment,

Method, prediction,

Hygiene, germs, wash, medicine, clean, Adults, babies, toddler, child,

teenager, grow, offspring, older,

younger, Kitten, calf, foal, puppy,

tadpole, caterpillar, egg, lamb, chick, duckling, etc....

lunch and dinner. Can Florence continue to eat fairy cakes? - yes but in moderation. Children showing the Christian value of **compassion** by helping Florence.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Use their observations and ideas to suggest answers to questions
LO: To describe the importance for humans eating the right amounts of different types of food.

(Assessed LO)

Christian Value: **compassion, respect**

3. **How does exercise affect our heart rate? (3 lessons)**

Children to learn that they exercise all the time without realising it - playtime, PE and it is important because it helps to build a strong body. What happens to our body when you exercise? Children to learn that heart is a muscle and exercise will make this muscle get stronger and better at its main job of delivering oxygen to all parts of the body. Exercise also makes you feel good and improves your mental wellbeing. Pose the question - how does exercise affect our heart rate? Children to learn that heart rate is the number of times our heart beats per minute. Children to predict what they think will happen. Children to learn how to check their heart beat - in wrist or neck. How are you going to do the experiment? How will you measure? - count how many heart beats in 10 seconds after each activity. Children to write the method for the experiment. Results table to record resting heartbeat, 2 mins of walking, 2 mins of running and then 2 mins of resting. Children to **persevere** and not give up when exercising. They also need to be **truthful** when recording their heartbeats. Using this data children to create a bar graph. Children to write a prediction on what they found out. I found out that exercise does affect our heart rate because my heart rate increased after I ran. My results show that my heart beat after running. My prediction was...

Scientific enquiry - Carry out simple tests. With help, observe changes over time. Record simple data Use their observations and ideas to suggest answers to questions. With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: describe the importance for humans of exercise.

(Assessed LO)

Christian Value: Perseverance, truthfulness,

4 How can germs be spread?

Children to learn that personal hygiene is how we look after our bodies. This mean sleeping ourselves clean and tidy and this keeps us healthier. What do you think may be include in personal hygiene? - brushing teeth, washing hands, clean clothes, showering/bath, blow noses, stopping to spread germs. Focus on washing hands - when should we wash them? Why do we wash them - stop germs spreading. Children to learn that the scientist Louis Pasteur discovered that germs did not just appear but that they are living things that can spread between objects and people through touch or through the air. Children to investigate how germs spread through touch by working in pairs, showing the Christian value of friendship. One child to put their hand in glitter. Without washing their hands shake hands with other children in their group. What has happened? So how are germs spread? What can you do to reduce this? We are thankful to Louis Pasteur as his discovery keeps us safer from germs and illnesses. Children to create a poster fact sheet about the importance of personal hygiene.

Scientific enquiry - Use their observations and ideas to suggest answers to questions

LO: describe the importance for humans of hygiene.

(Assessed LO)

Christian Value: thankfulness, friendship

5 Can you match an animal to its offspring?

Children to learn that the word offspring means the child or young of an animal, human or plant. Recap what the five animal groups are from year 1 - bird, mammal, amphibian, reptile and fish. Show pictures of a lamb, kitten (cat) and tadpole. These are offspring. What animals are their adults? Do all offspring look like their adult when they are born? Read Monkey Puzzle. Identify that generally offspring have features from their parents, however sometimes they don't - caterpillar/butterfly. This change is called metamorphosis. Give children pictures of adults and their offspring -match animal to their young. Show the children the

vocabulary Kitten, calf, foal, puppy, tadpole, caterpillar, egg, lamb, chick, duckling, etc.... Children to learn the names of baby animals e.g. baby rabbit is called a kitten. Match the names of the young to the pictures. Christian value of **thankfulness** - **thankful** for the world we live in.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: notice that animals, including humans, have offspring which grow into adults (Assessed LO)

Christian Value: **thankfulness**

6 What is a lifecycle?

Children to recap that offspring are the child or young of an animals, plant or human. What do we mean by a lifecycle? Watch <https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zttckqt> Read the Very Hungry Caterpillar. Give each child a strip of paper and ask them to draw the stages of the butterfly's life cycle. Egg - caterpillar - chrysalis - butterfly. Use tape to turn it into a ring shape. Highlight that it is a circle, a life cycle that keeps going around and around. Children to learn that there are five stages of a human life cycle. What are they - baby, toddler, child, teenager and adult? Which stage are you at? Draw the lifecycle of a human - make sure it is in a circular shape as it is a never-ending cycle. How does the lifecycle of a human differ to that of a butterfly? What other animal goes through a metamorphic change - frog. Christian value of **thankfulness** - **thankful** for the world we live in.

Scientific enquiry - With help, observe changes over time. With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: notice that animals, including humans, have offspring which grow into adults

Christian Value: **thankfulness**

Feedback:

Year 2
Uses of Everyday Materials
Chemistry

Knowledge to be taught:

- 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

Lesson Guide

Key Vocabulary

1. What is a material?

Children to learn that a material is what something is made from. These can be human-made or natural. Watch <https://www.bbc.co.uk/bitesize/clips/zm2jmp3> What materials can you spot? Watch <https://www.youtube.com/watch?v=XnkQcP-RHCw> to learn about different materials and their properties. Make sure the children know what each of these materials are wood, metal, plastic, glass, brick, rock, paper and cardboard. Children to go on a material hunt to find objects made from these different materials. What have they found out? Identify that we need to be **thankful** for these materials as without them life would be a lot harder. What would happen if plastic hadn't been invented?

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language

LO: identify a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.

*Christian Value: **thankfulness***

2. Which material is the most absorbent? (This will take two lessons)

Help - there has been a huge spillage in the school kitchen. Help us need to find the most absorbent materials so that it can be tidied up as quickly as possible. Show the children a selection of different materials - paper, toilet roll, kitchen roll, paper towels, clothes. Children to predict which they think will be the most absorbent. How could you conduct your experiment? What would your method be?

Ceramic, cotton, glass, plastic, rubber, wood, wool, fabric
Absorbent, characteristics, compare, material, property, soak up, Ceramic, cotton, glass, plastic, rubber, wood, wool, fabric
Bend, flexible, squeeze, hard, metal, rigid, rough, strength, stretch, smooth, soft, squash, strong, suitable, unsuitable twist, useful, waterproof, reflective, shiny,

You could use **Dangly Strips**: Cut a strip from each of the papers and then dangle these over the side of a beaker into some water so the edge of the paper just touches the water. Time how long it takes for the water to reach a line drawn on each of the papers or **Count the Drops**: Stretch the papers over beakers and then count the number of drops placed on the paper until you can see it leaking through and

into the beaker. Children to record what equipment they will need and which method they will choose. Write step by step instructions on how they will conduct their experiment. Children to conduct their experiment and record their results in a table. Christian value of **friendship** and **respect** as children to conduct experiment in pairs/threes. Which material was the most absorbent? Which was the least absorbent? Was your prediction correct?

Scientific enquiry - Begin to recognise different ways in which they might answer scientific questions. Carry out simple tests. Use their observations and ideas to suggest answers to questions

LO: identify and compare the suitability of a variety of everyday materials

Christian Value: **respect, friendship**

3. Which material would be suitable?

Provide the children with feely bags. Children to describe the object to a partner. What words have you used? These word are the properties of materials - e.g. Bend, flexible, squeeze, hard, metal, rigid, rough, strength, stretch, smooth, soft, squash, strong. Why are windows made from glass? What is it about a glass that makes the material a good choice for windows? What material wouldn't be suitable? Children to learn that materials are chosen so that an object is fit for purpose. Children to learn that sometimes the same object can be made from different materials, and we have to select the most suitable depending on what you are using it for. For example spoons. Some are made of plastic, metal and wood. Who would use a plastic spoon - baby. What about when we're cooking? Why wouldn't we used a metal one? Children to learn that suitability means having the properties which are right for a specific purpose. - metal is strong and lasts a long time. Wood is strong and has a high heat tolerance, plastic is light and cheap. Present to the children's different ideas. Would it be a good idea or bad?

Why? Would the material be suitable? Glass umbrella, chocolate teapot, metal hammer, wooden fork, stone bottle. Refer back to the property's words from the beginning of the lesson. Ask the children to use these in their explanation as to why they are or are not a good idea.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: Compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (Assessed LO)

Christian Value: *thankfulness*

4 Can you make an object change shape?

What if an umbrella was made of glass? Class discussion to recap on properties of materials and how suitable materials are chosen to make an object. Provide the children with a variety of objects made of different materials. Ask the children to sort them into those that the shape can be changed and those which you can't change the shape. How can you change their shape? Brainstorm vocabulary - highlighting bend, twist, squash, stretch. Children to learn what is meant by each of these properties. Children to explore a variety of objects, identify their materials and investigate if you can change its shape by squashing, bending, twisting and stretching. Children to show *respect* towards the resources by carefully manipulating them so not to break them. Record results in a table. What materials could you bend? Twist? etc

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)

LO: find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Christian Value: *respect, friendship*

5 Why is recycling important?

Children to learn the importance of recycling. Solid objects made from some materials can be changed by squashing, bending, twisting and stretching and then recycled. How many bins do you have at home? What are they each for? Black bin

general waste, green bin plastics and tins, purple bin paper and cardboard and brown bin garden waste. Show the children the recycling symbol. What are the benefits of recycling - it helps us *respect* our planet by reducing the rubbish littering our world, protects animals and their homes by making sure less rubbish ends up in places like forests and seas. Watch <https://www.bbc.co.uk/bitesize/clips/z7x2tfr> Go through how the different materials are recycled. Glass and metal are washed, broken into small pieces, melted and made into new glass bottles jars etc. paper is washed, mixed, trolled out to dry and then turned into different types of new paper and card. Some plastic can be recycled. They are crushed into small pieces, melted and turned into new things. Show the children a variety of objects. Ask them to sort them into the correct bins.

Scientific enquiry - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) Experience different types of science enquiries, including practical activities

LO: find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching in the context of recycling.

Christian Value: *compassion, respect,*

Feedback:

Year 3
Plants
Biology

Knowledge to be taught:

- To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant

- To investigate the way in which water is transported within plants
- To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Lesson Guide	Key Vocabulary
1. <i>What are the functions of the parts of a plant?</i> Children to recap the different parts of the plant. Watch https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-parts-of-a-plant/zvdkpg8 Look at the root, stem, leaves, flowers and anther. Children to learn what the function of each of these parts are. Roots The roots anchor the plant in the ground. They absorb water and nutrients from the soil. The stem or trunk holds the plant up. It also carries water and nutrients from the roots to the leaves. The leaves make food for the plant using sunlight and carbon dioxide from the air. Flowers are brightly coloured to attract insects and birds. The insects carry pollen to other flowers. Flowers use the pollen to make seeds to grow new plants. The anther contains pollen which brushes onto insects when they land on the flower. The pollen is moved by insects to other flowers. This is in much more detail to year 1. Identify how important plants are for us to survive - <i>thankfulness</i>. Children to create a lift the flap book with the plant on the outside and the functions written under each flap using the above vocabulary. <i>Scientific enquiry - Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions</i> LO: To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Christian Value: <i>thankfulness</i>	Absorb, air, fertiliser, fertilisation, flowering, fruit, function, germination, insect pollination, life cycle, minerals, non-flowering, nutrients, pollen, pollination, reproduction, seed dispersal, seed formation, soil, transportation, wind pollination
2. <i>How is water transported in plants?</i>	

Show the children a cup with blue food colouring in, another with yellow and an empty cup. (Or two primary colours) Pose the question *Can we make water walk?* Set up the experiment like the picture (middle glass empty) Discuss with the children - can we make water 'walk' from a glass into an empty glass? What do the children think will happen? Why and how? Write their predictions on a post it notes. Start the experiment. Look at the children's predictions. Discuss which are good - the writer justifies what they think using the word because.



Watch what is happening - the water is being absorbed by the kitchen roll and travelling up it into the other glass. Leave the experiment and check out results at the end of the session. Children to learn how this relates to the water transportation in plants. How is water transported within a plant? The root absorbs the water from the soil. The stem transports the water to the leaves. Water evaporate from the leaves. This evaporation causes more water to be sucked up the stem. The water sucked up the stem like water being sucked up through a straw. Highlight the absorption they are seeing in their walking water experiment to solidify their understanding of absorption. Show them an image of a carnation in water containing food colouring. Thinking about how water is transported within a plant, what do they think will happen to the flower? Children to write their prediction in their books. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ixys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhx> Discuss the carnation, that has changed colour and highlight why this happened. Were they correct? Children to draw a carnation in their books and explain what has happened focusing on how water is transported in plants. Check results of walking water. Christian value of *perseverance* - waiting for the experiment

Scientific enquiry - Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Make systematic and careful observations

LO: To investigate the way in which water is transported within plants

Christian Value: *Perseverance*

3. *What are the male and female parts of a plant?*

Recap the basic parts of the plant and their functions. Children to learn that a plant is made up of more than those basic parts. Children to watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-the-anatomy-of-the-flower/zjmhkmn>. Children to identify the stamen, stigma, style, ovary and filament in a lily as well as the petal and anther by dissecting a plant and sticking the appropriate parts on a grid. Christian value of perseverance when dissecting the flower.

Scientific enquiry - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Christian Value: *Perseverance*

4. *How do parts of the plant help pollination and fertilisation?*

Children to learn that it is these parts of the plant that aid pollination. Pollen from the anther is transferred to the stigma - by insects or wind. This is pollination. Pollen then travels down the style to the ovary. Once it reaches the ovary the pollen joins with an ovule. The ovule then grows into a seed - fertilisation. Watch <https://www.bbc.co.uk/bitesize/clips/zfx76sq>. Children to order statements of the pollination and fertilisation process. In books children to draw and explain the processes of pollination and fertilisation separately.

Scientific enquiry - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Christian Value: *Perseverance*

5. What is the Life cycle of a plant?

What do we mean by a life cycle? Link to previously taught ones in EYFS - butterfly / chicken. Children to learn that there are five stages in the life cycle of a flowering plant. Germination, growing and flowering, pollination, fertilisation and seed formation and seed dispersal. Go through each stage with the children. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-is-pollination-and-how-does-it-work/zv4df4j> How can seeds be dispersed? - wind, insects, dropping, eating, bursting,, water, shaking. Christian value of respect - **respect** living plants and animals as they ensure our survival. Create a life cycle in books, labelling each stage and what happens.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions

LO: To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Christian Value: **respect**

6. What do different plants need to grow well?

How do you know the person next to you is alive? Link to the seven life processes lesson and MR GREN. So, are plants alive? - How do you know? Thinking about Mrs Gren what do they need to grow well? Who has plants? How do you look after them? Children to set up an investigation into finding out What plants need to grow well. What could you investigate? Children to write down on post it notes what they could change in their investigation. E.g. sun/no sun, water/no water heat/no heat. Write each idea on one post it note. How will we know if a plant has grown well? What could we do? / Measure? Jot ideas down onto post its. Identify that they need to measure the height of their plant BEFORE they start the experiment and AFTER to see how much it has grown. Children in threes to choose what experiment they are going to conduct with their plant. See above. Discuss a fair test and that they can only change one thing. E.g. no sun or sun but that means both plants will have water and be in the same location. What equipment

will they need? Identify if they're doing sun/no sun they'll need a dark cupboard, heat/no heat will need window sill and fridge and water/ now water will need to be in the same location for a fair test. Plan the experiment in threes and create a table to record results. Measure the starting height of the plants and record in table. Set up experiment and leave. Christian value of **friendship** - working as a team to plan and set up experiment and **respect** by listening to each other's ideas.

Scientific enquiry - Take accurate measurements using standard units. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Set up simple practical enquiries, comparative, and fair tests

LO: To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant

Christian Value: **friendship and respect**

7. What do different plants need to grow well?

Children to recap experiment set up last week - what does a plant need to grow well. Look at the children's results. Children to measure their plants and record in their table. Children to share with the class what they have found out verbally. As a class listening out of **respect** discuss what they have together found out - a plant needs soil, water and sun to grow well. Children to create a flap book on what a plant needs to grow well.

Scientific enquiry - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. Take accurate measurements using standard units. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.

LO: To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant

Christian Value: **respect**

Feedback:

Year 3
Animals including Humans
Biology

Knowledge to be taught:

- To identify that animal, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Lesson Guide

Key Vocabulary

5. What are the five food groups?

How do you know the person next to you is alive? Recap MRS GREN and the seven life processes. Children to learn the importance of nutrition. What is nutrition? Why do Humans need nutrition to be healthy? What would happen if we didn't eat/drink? Why? Need for growth/health/energy etc. Body like a car. Children to sort foods (or pics of foods), however they want -use post it's to label the groups. Bring together and discuss ways of sorting. Children to learn the five different food groups - carbohydrates, protein, dairy, fats and sugars and fruits and vegetables. Go through the different groups and look at examples of foods that belong in each of them Can they name something they ate last night/that's in their lunch box and identify which food group it comes from? Watch - food groups are rocking tonight. <https://www.youtube.com/watch?v=GalxxVnn8Yg> In books children to record the five food groups and classify foods in the corresponding groups. Once you are happy with your groups, record your findings in your science books. Watch <http://www.bbc.co.uk/education/clips/zcvtsbk>. Discuss with the children that we need to be thankful for the food that we have to eat.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify that animal, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

Christian Value: *thankfulness*

6. What is a balanced plate of food?

Recap what the five food groups are. Children to learn the function of food groups. Carbohydrates release energy slowly. Protein for growth and strength. Airy help our bones grow and become strong. Fats and sugars give energy quickly.

Fruits and vegetable keep the body healthy and fit. Watch

<http://www.bbc.co.uk/education/clips/zcvtsbk>. As a group come up with some actions to help children remember function of each food group, showing *respect* and listening to each other's ideas. E.g. show arm muscles for protein. Children to learn the difference between nutrients and food groups. There are seven different types of nutrients - carbohydrates, protein, fats, vitamins, minerals, water and fibre. Most foods contain more than one type of nutrient. Discuss why is it important to make good choices with food. Watch

<https://www.youtube.com/watch?v=MdVTq6a2tZM> Operation ouch - how we need the right amount of food/energy for our bodies to function properly. Look at the Eatwell plate. Identify that it is split into different sections and the size relates to the amount of food type we should be eating for each section. Create a balanced meal and record in books. Do humans need the same amount of nutrients as other animals? Read the data from the pie charts on nutrition comparing humans and dogs.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify that animal, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

Christian Value: *respect,*

1. What bones do you have in your body?

In pairs give the children a body or draw around a friend. Christian value of **friendship** when drawing around a friend or when labelling a body in pairs. Ask them to label any body parts that they know to the outline. Discuss. Did anyone label any bones? Give the groups the names of the common bones. Can they add them to their skeleton? How many do they know? Which bones can they feel on their **own** bodies? - How many ribs can they feel? How many bones make up your arm/leg? Can you feel your Kneecaps? There are 206 bones in adult skeleton (babies more). Why do we need lots of separate bones? Watch

<https://www.bbc.co.uk/bitesize/clips/zmptsbk> and

<https://www.youtube.com/watch?v=ywDOiNEdJvc> Place pictures of different parts of the skeleton e.g. cranium, femur around the room. In pairs children to go to each skeleton part and collect the typed label of that body part and match it to their skeleton. Stick on their bodies. Sing dem bones song-learning the names of bones. Children label skeleton using the labelled one from in their pairs to help them. Do animals have the same bones as humans? Show children bones of animals and discuss.

Scientific enquiry - Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To identify that humans and some other animals have skeletons.

Christian Value: **friendship**

2. What is the purpose of our skeleton? What are your joints?

Children to learn recap the bones they previously learnt. Play Simon says. Look at and discuss x-rays, what are they for etc. have some on tables for children to explore. Have any of the children ever broken a bone? Show x-ray of broken bones. Can they guess what bone is shown? Discuss how bones mend etc. Why do we need a skeleton? - let one of the paper outlines from last week fall to the ground - Support. What do the children know about their skeletons? What else do our skeletons do? - protection, movement, place for muscles to attach. What do our skeletons do - <https://www.bbc.co.uk/bitesize/topics/z9339j6/articles/zqfdpbk>. first look at protection. What does your skeleton protect? Why do they need protecting? Using a skeleton children to colour in red all the bones that protect us. How do our skeletons support us? Add to skeleton the bone that help us keep our shape

Ankle, backbone, balanced diet, ball and socket joints bones, brain, carbohydrates, collar bone, contract, fibre, exoskeleton, endoskeleton, hinge joints, kneecap, movement, muscles, nutrients, nutrition, pelvis, protection, protein, relax, ribs, skeleton, skull, spine/vertebra, support, tendons, vertebrate, invertebrate, vitamins, minerals, cranium, carpal, scapula, vertebral column, femur, patella, phalanges

and stay upright (vertebral column) How else does our skeleton help us? Movement. Go through the three different joint types - ball and socket, hinge and gliding. Finally children to identify the different joints that help us move. They can circle and label on their skeleton. Look at a skull. What joint is our jaw? - hinge joint. Christian value of **perseverance** going through each area of the skeleton. Operation Ouch - <https://www.youtube.com/watch?v=cuGRHKIUUjk>

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Christian Value: **Perseverance**

3. What is an endoskeleton / exoskeleton / hydrostatic skeleton?

Children to learn that animals have different skeletons. Look at pictures on tables of animal skeletons. What skeletons can they see? How are they different from a human skeleton? Discuss as a table. Christian value of **respect** - sharing resources. Then watch <https://www.bbc.com/bitesize/clips/zg2qxnbn> on fish skeletons. Look at how skeletons move. What is an invertebrate? / Vertebrate? Watch

<https://www.bbc.com/bitesize/articles/zp6g7p3>

<https://www.bbc.com/bitesize/articles/z8mbqhw> Look a difference between exo / endo and hydrostatic skeletons. Endoskeleton - vertebrate with skeleton inside body, exoskeleton - invertebrate with skeleton on outside the body, hydrostatic skeleton = invertebrate with no skeleton. Children to sort the skeleton types into endoskeleton, exoskeleton, hydrostatic skeleton. Then go through the pros and cons of each skeleton. Watch <https://www.youtube.com/watch?v=18fCVbkkCFg> So why are animals' skeletons different? What is the function of their skeletons? Operation ouch skeletons <https://www.youtube.com/watch?v=0Qr6H-eJF> <https://www.youtube.com/watch?v=A2jTQCGYJk>

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Christian Value: *respect*

4. What are the seven life processes?

Children to learn the seven-life process. Watch

<https://www.bbc.co.uk/bitesize/clips/ztbw2p3> How do we know something is alive?

Look at the mnemonic MRS GREN. Children to learn that each letter represents a different life process. For something to be alive it has to have all these life process. Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition. Children to use DKFindout <https://www.dkfindout.com/uk/animals-and-nature/what-is-living-thing/> to research and complete a thinking frame or poster on the seven life processes. Highlight that we need to *respect* all living organisms as they are all important and be thankful for the world, we live in.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify the seven life processes.

Christian Value: *respect, thankfulness*

7. How do our muscles work?

Children to recap the bones in our bodies, the purpose of our skeleton, and the types of joints. What type of skeleton do humans have? We have an endoskeleton. Are we a vertebrate or invertebrate? Children to learn that the bones in our skeleton move because they are pulled by muscles. There are two types of muscle. Voluntary - putting hand up and involuntary - heart. Voluntary muscles can pull but not push. They are joined to bones by tendons and work in pairs to help bones move. Get the children to look at their bicep and triceps. Discuss bicep contracting and getting smaller when you put your arm towards your shoulder and the triceps relaxing and getting longer. As the arm goes down the bicep relaxes and gets longer and the triceps contracts and gets shorter. Identify that we need muscles to live e.g. the heart. Exo and hydrostatic skeleton animals also have muscles to move. Watch <https://www.bbc.co.uk/teach/class-clips-video/science-ks2-how-do-muscles-and-bones-work/zfgtscw> Children to make a model arm and explain how the muscles work.

Scientific enquiry - Make systematic and careful observations. Raise their own relevant questions about the world around them

LO: To identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Christian Value: *Perseverance*

Feedback:

Year 3
Rocks
Chemistry

Knowledge to be taught:

- To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- To describe in simple terms how fossils are formed when things that have lived are trapped within rock
- To recognise that soils are made from rocks and organic matter.

Lesson Guide

1. *What are the three types of natural rocks?*

Where do we find rocks? Children to learn that rocks are all around us e.g. tiles, toilets, basins, plaster, bricks, roofing materials, playground, pavements, kerbs, walls, steps, posts, lintels. Where would we find rocks around our school? Tell the children that sand and other rock ingredients make concrete, clay is used to make ceramics and tiles, sand and limestone makes glass. These types of rocks are man-made. Children to learn that there are three types of natural rocks - igneous, sedimentary and metamorphic. Watch <https://www.bbc.com/bitesize/articles/zsgkdmn> on how rocks are formed. Using the simple rock cycle, use starbursts to create the three types of rocks. Give each child one of each of the colour of starbursts. Using their four starbursts, children to stack on top of each other - this is sedimentary rock. Put the sedimentary rocks into a food bag. Children to apply heat and pressure from their hands to squash the starbursts until the colours begin to mix - metamorphic rocks formed by heat and pressure. Christian value of

Key Vocabulary

Absorbent, basalt, chalk, clay, crystals, drainage, erosion, soil, fossils, grains, granite, hard/soft, igneous, limestone, manmade, manufactured, marble, metamorphic, mineral, natural, particles, peat, pebble, permeable/impermeable, plant matter, porous, quartz, rock, sand, sandstone sedimentary, separation, slate, soil type (clay, peat, sandy) stone, surface, texture

perseverance creating metamorphic rock. Then put the whole classes metamorphic rocks in a bowl and in the microwave. Melt the starburst - igneous rock.

Scientific enquiry - Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Christian Value: *Perseverance*

2. What rocks are permeable / impermeable?

Recap what the three types of rocks are. Provide children with rocks and magnifying glasses and ask the children to group them. How have they done it? What words could you use to describe these rocks? What are their physical properties? What can you see? Hard? Soft? Layers? Crystals? Use post it notes to add to their sorted rocks. Display - impermeable, permeable, density, durability, hard and soft. Do they know what these words mean? We are focusing on impermeable/permeable. Go through what these words means. How could we find out if a rock is Permeable/impermeable? In pairs give the children the five rocks - slate, obsidian, pumice, chalk and sandstone. Which do they think will be impermeable? Why? Which do they think will be permeable? Write prediction as to whether they think the rock will be permeable or impermeable. Draw a table to record the result. Conduct experiment recording results. Use a syringe to test rocks. Children showing the Christian value of *respect* towards the equipment.

Scientific enquiry - Set up simple practical enquiries, comparative, and fair tests. Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Christian Value: *respect*

3. What rocks are durable and have low- and high-density?

Children to recap the three types of natural rocks and what the words permeable and impermeable mean. Name a permeable rock? Impermeable? Children to learn

what durable and high and low density mean. Durability means hard wearing and high density means float; low density means sink. In pairs give the children the five rocks - slate, obsidian, pumice, chalk and sandstone. Which rock do they think will be durable? /low/high density? Write a prediction, draw a table and conduct experiment. Use a beaker of water to test if rock has a high or low density. Use sandpaper and lightly scratch a rock to see if it is durable. Record results. Pose the question - which rock would be suitable to create a dam? What characteristics would the rock need to have? It would have to be durable, impermeable and have a low density. Looking at their results, which rock would be a good choice?

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Christian Value: Perseverance, thankfulness, truthfulness, compassion, respect, friendship

7. What is soil made up of?

What do you know about soil? What is it? Soil is a mixture of tiny particles of dead and rotting plants and animals, rock, air and water. Watch

<https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/zgqkcmn> Identify that there are different types of soil depending on their properties The different types of soil

Different soils have different properties depending on what they are made from.

- **Sandy soil** is pale coloured and has large particles. These create lots of small air gaps. Water drains through them easily so it usually feels dry.
- **Clay soil** is usually sticky and has small particles. They contain very few air gaps and water does not drain through it easily.
- **Chalky soil** is a light brown soil. Water drains through it quickly.
- **Peat** does not contain any rock particles. It's made from very old, decayed plants and is dark, crumbly and rich in the useful chemicals that plants need called **nutrients**.

Go through the quizzes at the bottom of <https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/zgqkcmn>. Recap what soil is. Discuss with the children that soil is made up of five different layers. Bedrock, parent material, sub soil. Top soil and organic material. Children are to follow the instructions on the board to create their own soil. Using the diagram, children to label the different layers, colour if time and stick in books. Take photos of soil for see-saw. All - what is soil? Write answer in book under diagram - soil is a mixture of tiny particles of dead and rotting plants and animals, rock, air and water. HAP - what can you remember about the different types of soil? Explain. Watch https://www.youtube.com/watch?v=FBd6du_3tDw BBC science clips rocks and soil for colonisation of whole year

Scientific enquiry - Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions

LO: To recognise that soils are made from rocks and organic matter.

Christian Value: compassion,

4. How are fossils formed?

Children to recap the different rocks and how they are formed. Pose the question - Are dinosaurs real? How do we know? What evidence is there? Introduce fossils. Highlight that we are **thankful** to palaeologist and archaeologist as they have discovered the evidence through hard work, so we are now what life was like in the past. There are many different ways fossils occurred however we are going to focus on fossils formed in rock - what rocks do you find fossils in? Sedimentary - Remind children of starbursts. Fossilisation only takes place in sedimentary rocks as the heat from the lava that creates igneous rocks and changes the structure of metamorphic rocks would be too high for fossils to survive. Introduce fossils.

Watch <https://www.bbc.com/bitesize/articles/z2ym2p3> (how fossils are made) and <https://www.bbc.com/bitesize/articles/z22g7p3> (what we can learn from fossils)

Go over fossilisation process - step by step by having the section of pictures and words on the tables for each child. Step 1 - An animal dies, and the soft parts of its body **decompose** leaving the hard parts, like the skeleton, behind. This becomes buried by small particles of rock called **sediment**. Ask the children what picture relates to this? Can they find it? Can they find the matching words that would go

with it? Repeat with step 2,3 and 4. Step 2 - As more layers of sediment build up on top, the sediment around the skeleton begins to compact and turn to rock. Step 3 - The bones then start to be dissolved by water seeping through the rock. Minerals in the water replace the bone, leaving a **rock replica** of the original bone called a fossil. Step 4 - Then over millions of years the rock rises to the surface and is worn away by erosion and the fossils can be seen. Children to stick the correct order in their books with the corresponding explanation. Watch video clip showing how fossils are formed. <http://www.planet-science.com/categories/under-11s/our-world/2011/10/what-makes-fossils.aspx>

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To describe in simple terms how fossils are formed when things that have lived are trapped within rock

Christian Value: **thankfulness**

5 Can you make a fossil?

Children to recap the four steps to how a fossil is formed. Children learn how to make their own fossil using CBeebies video

<https://www.bbc.co.uk/cbeebies/makes/presenters-making-a-fossil>. Children to then use DKFindout to research and answer questions on fossils using a thinking frame. Research fossils on DKFindout <https://www.dkfindout.com/uk/dinosaurs-and-prehistoric-life/fossils/> Christian value of **truthfulness** - finding the **truth** about what life was like millions of years ago.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To describe in simple terms how fossils are formed when things that have lived are trapped within rock

Christian Value: **truthfulness**,

6. Fossils from the Collection

Ask children to think about how we know about the past. Ask them how they know what Sleaford was like 10 to 20 years ago. Identify different types of evidence - photographs, films, videos, documents word of mouth and artefacts. How do we know about even further back in time? Recap the idea of archaeology

and how digging in the ground can unearth evidence of how we lived many years ago. - talk about the stone age etc. Then ask them about how we know which animals roamed the earth millions of years ago - dinosaurs. How do we know what was around millions of years ago - fossils. Tell the children in the suitcase are a selection of fossils. What do they want to find out? Write questions on post it notes. Children to show **respect** when exploring the fossils from the Collection in Lincoln and **friendship** as they will have to take turns to explore all the fossils. Using magnifying glasses. (Selection upon each table - Children to rotate around the tables observing the fossils. Then choose one to draw and label in sketch books or science books. Who was Mary Anning? How was she important in the discovery of fossils? Watch <https://www.youtube.com/watch?v=qNOh-85Dmc>

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To describe in simple terms how fossils are formed when things that have lived are trapped within rock

Christian Value: **respect, friendship**

Feedback:

Year 3

Light

Physics

Knowledge to be taught:

- To recognise that they need light in order to see things and that dark is the absence of light
- To notice that light is reflected from surfaces
- To recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- To recognise that shadows are formed when the light from a light source is blocked by a solid object
- To find patterns in the way that the size of shadows changes.

Lesson Guide

Key Vocabulary

1. **What is a light source? What is dark?**

Children to learn about what a light source is. Give the children a selection of pictures. How could we group the pictures? Discuss. Give the children some feely bags Without looking inside what can you feel? What would make it easier to find out? Light We can see things when there is light. Where is the light coming from? Could be the Sun or lights (or both) in the classroom. Identify that we should be **thankful** of the sun as it enables us to see. Discuss what the children already know about light. Tell children that the Sun and lights are sources of light - they give out light. Are there any other light sources in the classroom? E.g. computer screen, desk lamp, torches, etc. Look again at the pictures from the start of the lesson and sort and identify the light sources. Go through the tricky ones to explain why they are not light sources - mirror, moon, window. Children to identify light and non-light sources. Children to label objects. What is darkness? Where is it really dark? In a cupboard, in a tunnel, in the cellar, down a well, under the bed clothes, in a cinema, etc. Talk about times when children have been outside in the dark - there is usually some light, e.g. streetlights, moonlight (reflected light!), shop lights, car headlights, bicycle lights, advertising displays, stars, torches, fireworks & bonfires, etc. Briefly talk about how our eyes adjust to the dark (children can observe each other's pupils in light/dark situations-close eyes tight for 20 seconds then open quickly). Point out that darkness is an absence of light. Story - Owl who was Afraid of the Dark

Scientific enquiry - Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To recognise that they need light in order to see things and that dark is the absence of light

Christian Value: **thankfulness**

2. What material is the most reflective?

Children to learn <https://explorify.wellcome.ac.uk/en/activities/odd-one-out/shiny-things> which is the odd one out? Identify that there are all shiny' things and reflect the light. Watch <https://www.bbc.com/bitesize/clips/ztcg9j6> What does it look like if a material reflects light well? Which colours do you think reflect most light? What are reflective materials useful for? Discuss that light travels in a straight line

Absorb, block, brighter, candle, dangerous, dark, day, dim, direction, highest, light beam / source, light travels, longest, mirror, names of light sources, night, opaque, protection, reflet, reflective, shadow, shortest, sun, surface, torch, translucent, transparent, UVA, UVB

(this will be revisited in year 6) and that the light bounces (reflects) off an object into our eyes so we can see it. Pose the question - What material is the most reflective? Show the children a variety of different materials. How are we going to answer this question? Children to place a torch through a cut out hole in a piece of white card and shine it at the material they are testing. A good reflective material will bounce the light back and light up the card. Christian value of **friendship** as they are working in pairs. Children to write a prediction and then conduct experiment. Rank the materials in the order from the most reflective to the least reflective. What did they find out? Together write a conclusion following the PEEL format - complete the PE We found out that foil was the most reflective material. My results showed that when the torch shone, the material reflected the light the best because it was shiny.

Scientific enquiry - Raise their own relevant questions about the world around them Make systematic and careful observations. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them

LO: To notice that light is reflected from surfaces

Christian Value: **friendship**

What do the words translucent, transparent and opaque mean?

Show the children three objects - one transparent (glass) one translucent (bubble wrap/water bottle/cling film) and one opaque (cup) for example. How are they different? Children to learn what the words transparent, translucent and opaque mean. Transparent - you can see through it. Translucent - some light passes through it, so you can't clearly see through it. Opaque - you can't see through it. Look at a variety of objects identifying if they are opaque, transparent or translucent. Watch

https://www.youtube.com/watch?v=P6UihN8V3h4&feature=emb_logo Remind the children that light travels in a straight line. Children to sort objects into translucent/opaque/transparent. Watch

<https://www.youtube.com/watch?v=8rrnMOjIGjI> as a quick recap. Focus on opaque objects. Using a torch/lamp and an opaque object, model how we can check the

object is opaque - it casts a shadow. Write prediction. Children to explore 5 objects to see if they are opaque by investigating their shadow. Christian value of *friendship* as working with a partner to explore objects. **THE DARKER SHADOW IS CREATED BY AN OPAQUE OBJECT**

Scientific enquiry - Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions

LO: To recognise that shadows are formed when the light from a light source is blocked by a solid object

Christian Value: *friendship*

4. How can you make a shadow bigger?

What did you discover last time? Darker objects make a darker shadow. Pose the question how could you make a shadow bigger? Children to create a shadow puppet. Children to predict how they will make the shadow bigger using the word beans. Using a torch children to answer the question. Present what they have found out to the class - The closer an object is to the light source, the more light is blocked. This means the shadow created is bigger. But if an object is far away from the light source, it does not block out much light, so the shadow is smaller. Christian value of *respect* - listening to their peers' explanations of what they have found out.

- Scientific enquiry - Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions

LO: To find patterns in the way that the size of shadows changes.

Christian Value: *respect*

5. Where is the lightest place in the school?

Children to learn how to use a data logger. Where do you think the lightest part of the school is? The darkest? Is there a way to find out? Show the children a data logger. Identify that it measures temperature, sound and light. We are only going to look at the light recording. What will the unit of measure be? Why won't it be cm?

km? miles? Introduce the word Lux. (Lux (Illuminance) is a measurement of the light intensity.) and tell the children that this is the unit of measure for light on the data logger. Set up data loggers in different locations around the school Pose the question - *Where is lightest place in our school?* Choose places and add to table of results. Children to jot their prediction down on a post-it note. Children to then use the data loggers to investigate different locations around the school. Christian value of **respect** - being quiet to not disturb other working around the school. Children to write a short conclusion in their book about what they found out. E.g. the atrium was the lightest place in the school. I know this because the data logger read the light intensity at ...

Scientific enquiry - Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately

LO: To learn how to use a range of (new) equipment, such as data loggers.

Christian Value: **respect**

5. How can we keep ourselves safe from the sun?

The lightest place was where there was the most sunlight. So how safe is the sun? sort statements into true and false about the sun e.g. causes sun burn, wrinkles, damages eyes, helps people make vitamin D, helps plants make food, causes skin cancer, provide warmth, makes people feel happier, source of light. Children to learn about UV light. Learn about how the pupil lets light in and that is how we see. Look at how the pupil grows bigger in the dark and smaller when the light is bright. Children to learn that if too much light comes through the pupil, it can damage the retina. So we should never look directly at the sun or look at bright indoor lights or shine lights into anyone's eyes. We can protect our skin from UV rays with sun cream. How can we protect our eyes - sunglasses. Highlight that they need sunglasses with a high UV rating. They could also wear a hat and have regular eye tests. Children to create a poster on sun safety. Christian value of truthfulness - children to be **truthful** about the damage the sun could do to us.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations LO: To recognise that light from the sun can be dangerous and that there are ways to protect their eyes Christian Value: <i>truthfulness</i>	
Feedback:	

Year 3 Forces and Magnets <i>Physics</i>	
Knowledge to be taught: - To compare how things, move on different surfaces - To notice that some forces need contact between 2 objects, but magnetic forces can act at a distance - To observe how magnets, attract or repel each other and attract some materials and not others - To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - To describe magnets as having 2 poles - To predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	
Lesson Guide	Key Vocabulary
1. <i>What is a force?</i> Children to learn that a force can be a push, pull or twist. Ask the children what they know about forces and magnets. Watch https://www.bbc.co.uk/bitesize/clips/zkw8q6f. What forces can they see? A force is a push or a pull. It can make something change size, shape, speed or direction. Use fimo to explore push and pull force. Can they make the fimo change shape? Size? Discuss what they found out. What happened when they applied a force to the fimo? Give the children a car. Can they make them change speed? Direction?	Attract, bar magnet, aluminium, brass, contact force, copper, direction, distance, faster, force, friction, gravity, horseshoe magnet, iron, magnetic force, magnetic material, metal, north pole, poles, south pole, pull, push, repel, slide, slower,

How? Discuss - how did they make the objects change size, shape, direction or speed? Christian value of **respect**- **respecting** the equipment. Emphasise that they exerted a force on the object which changed the object. Highlight that these forces need contact between two objects - their hand and object. Go through some images. What force is being exerted? Push or pull? Identify that there is another type of force - twist. Watch

<https://www.bbc.co.uk/bitesize/topics/zn77hyc/articles/zptckqt>. Discuss the arrows - showing the direction an object is moving and the size difference of the arrow when more or less force is applied. In books children to draw objects and label force used to make them move. Explore forces on <https://www.dkfindout.com/uk/science/forces-and-motion/what-is-force/>

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To notice that some forces need contact between 2 objects, but magnetic forces can act at a distance

Christian Value: **respect**

2. Which surface creates the most friction for a toy car?

Children to recap what a force is. Watch

<https://www.bbc.co.uk/bitesize/topics/zsxxsbk/articles/zxqrdxs>. Children to learn what is meant by friction. Friction is a force that holds back the movement of an object. Friction acts in the opposite direction to the movement of an object. Pose question - which surface creates the most friction for a toy car? If the surface has more friction will the car travel further or shorter distance? (Have whiteboards set up at a specific height (two bibles high) Children to put the car at the top of the ramp and let go. The floor to be covered by different materials - bubble wrap, carpet, table, sugar paper, fur, felt. Record the distance the car has travelled) Guided planning - model to the children how we plan an experiment by completing method equipment and question. Model how to write a prediction. Emphasise using the word because. Children to individually write their own prediction. Children to

smooth surfaces, spin, steel, strength, stretch, twist

then draw a results table in their books and conduct experiment. Christian value of *friendship* shown as working as a three.

Scientific enquiry - Make systematic and careful observations. Take accurate measurements using standard units

LO: To compare how things, move on different surfaces

Christian Value: *friendship*

Which surface creates the most friction for a toy car?

Quick recap of what they did last week -which surface created the most friction for the car? How do they know? On the board display a table of results. The data in this table will be used by all children to create a graph. Look at the results table. How else can we represent these results? Graph. Model how to use the results to draw a graph. SO, what surface created the most friction for a toy car? Use the results on the board and model how to write PE (from the PEEL!) conclusion using the flap book method. Children to write one section at a time. I found out that the bubble wrap created the most friction for a toy car because the surface was rough. My results show that the car only travelled 5cm.

Scientific vocabulary - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To compare how things, move on different surfaces

Christian Value: *Perseverance*

3. *What materials are magnetic?*

What are magnets? Magnets are a special object that produce a magnetic force around itself called a magnetic field. If certain materials enter this magnetic field they will be attracted to the magnet. This will cause the materials to be pulled towards the magnet. Children to explore this using a magnet and paperclips. How will they know if a material is magnetic? Watch Magnet <https://explorify.wellcome.ac.uk/en/activities/whats-going-on/magnets> What materials are magnetic? The magnets in a scrapyard sort magnetic materials from nonmagnetic materials. Watch magnet is a scrapyard

<https://www.bbc.co.uk/bitesize/clips/zcmtsbk> Provide children with a variety of materials and metals. Predict which they think will be magnetic. Why do they think this e.g. they are made of metal? Draw a results table in books. Children to test whether their materials are magnetic and record results. Christian value of **perseverance** as children test a variety of materials. Discuss together what they have found out. Then write what they have found out - emphasise not all metals are magnetic. Iron, nickel and cobalt are the only magnetic metals. Consolidation - Which metals are magnetic

<https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zw889qt>

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Raise their own relevant questions about the world around them. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them

LO: To observe how magnets, attract or repel each other and attract some materials and not others. To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials

Christian Value: **Perseverance**

4. What are the poles of a magnet?

Recap what they have learnt about magnets. Which metals are magnetic? Show the children a bar magnet. What can you see? Discuss that a magnet has two poles. A north and a south. Discuss the meaning of the words attract and repel when referring to magnets. What do you think will happen if two north poles face each other? What about two south poles? What about a north and a south pole?

Children to predict what they think will happen when the different poles are near each other and record using bar magnet diagrams. Children to explore the magnet and record on their sheet using arrows what happened. Christian value of **respect** - **respect** towards to magnets to ensure the magnetism of the magnet is not damaged. Discuss - which repelled? Which attracted? What is a magnet

<https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zpv.crdm> Magnets and their invisible force <https://www.bbc.co.uk/bitesize/clips/zk9rkqt> Are all magnets the

same strength? Investigate using the magnets. Children to write a small paragraph in their books to explain what they found out. Watch <https://www.bbc.co.uk/teach/class-clips-video/primary-science-how-is-steel-made/zfnryrj6> on how steel is made.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Raise their own relevant questions about the world around them. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them

LO: To describe magnets as having 2 poles. To predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

Christian Value: *respect*

Feedback:

Year 4 Living Things and their Habitats <i>Biology</i>	
Knowledge to be taught: - To recognise that living things can be grouped in a variety of ways - To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - To recognise that environments can change and that this can sometimes pose dangers to living things.	
Lesson Guide	Key Vocabulary
1. <i>How could we group living things?</i> Show the children some plants and animals. What do they have in common? Children to learn what characteristics all living things share. Mrs Gren - movement, respiration, sensitivity, growth, reproduction, excretion and nutrition.	Amphibian, bird, classification key, consumer, deforestation, differences, ecological, environment, fish, flowering plants, grasses, human impact,

How could we group living things? - into plants and animals, diet, habitat?
Discuss this with a partner, showing **respect** by listening to each other's ideas
Children to create a 3-way Venn diagram sorting animals into lives in water / on land / lays eggs / breathes air.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To recognise that living things can be grouped in a variety of ways

Christian Value: **respect**,

insects, invertebrates, mammals, pollution, predator, prey, producer, reptiles, similarities, slugs, snails, spiders, trees, vertebrates, worms

2. How can changes in the environment affect living things?

Children to learn what an endangered species is. What could we do to help protect them? Investigate who WWF is and which animals they are helping conserve and which animals are endangered. Create a poster to highlight the issues and encourage people to save the endangered animals. Discuss that we need to show **compassion** towards these animals and **respect** their importance in our world.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys. Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions

LO: To recognise that environments can change and that this can sometimes pose dangers to living things.

Christian Value: **compassion, respect**,

3. What is a vertebrate?

What do we mean by classifying? - grouping What is a vertebra? A backbone. It has an endoskeleton. Children to learn the five different vertebrate groups - mammals, fish, birds, amphibians and reptiles. Do they know anything about the different groups? Show the children a selection of animals. Classify animals into the different groups. What are the key features of each classification group?

Children to look at fact cards and record the information in a table e.g. warm or cold blooded, lay eggs or live young, etc. Christian value of **thankfulness** of the variety of animals in our world.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Christian Value: *thankfulness*

4. What are invertebrates?

Recap what a vertebrate is. So what is an invertebrate? Children to learn what an invertebrate is - no backbone. What about their skeleton - hydrostatic or exoskeleton. What does this mean. Any examples. Children to go to the garden and search for invertebrates. Use magnifying glasses to identify invertebrates found. Children to share their findings. In books children to draw one invertebrate they have found, annotating their characteristics. Christian value of *thankfulness* of the variety of animals in our world.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Christian Value: *thankfulness*

5. Can you create a classification key?

Children to recap vertebrates and invertebrates. Look at different animals and identify their key characteristics. Put four animals on the board - e.g. fish, bird, elephant and frog. What question could you ask to sort these into two groups? E.g. are they warm blooded. Write question at top of board and put yes and no. How could we then split up a bird and an elephant? Is it a mammal? How could you classify frog and bird? Model on board how to create a classification key. Repeat. Children to learn how to create a classification key initially using post it notes and four given animals. Then create one in their books. Christian value of *thankfulness* of the variety of animals in our world.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Christian Value: <i>thankfulness</i>	
Feedback:	

Year 4
Animals including Humans
Biology

Knowledge to be taught:

- To describe the simple functions of the basic parts of the digestive system in humans
- To identify the different types of teeth in humans and their simple functions
- To construct and interpret a variety of food chains, identifying producers, predators and prey.

Lesson Guide

1. What are the functions of the four types of teeth?

Children use a mirror to look inside their mouth. Can they spot any teeth that are the same/ different in their mouth? Do they know what they are called? Children to learn what the four different types of teeth are- incisors, premolar, molar and canine (wisdom) Teach that children have 20 teeth and adults 32 (36 with wisdom) Discuss the different functions of the teeth and create actions for each tooth. Incisors - sounds like scissors - cut/bite. Molars (fists together look bumpy) - grind. Canines - rip/tear - we use knives and forks so need fewer! Identify that herbivores/carnivores/omnivores need different sets of teeth and why. Look at the models of teeth, individual and mouth and look at the shape. Using mirrors again, how many molars can you feel/see? Canines? Incisors? Children to create the teeth using playdoh. Draw and label teeth in books. Look at pictures of other animals' teeth. Why are their teeth different to ours? - some are herbivores, and they don't need canines. Carnivores don't need molars as they don't need to crush and grind their food. What animal do you think they are? Compare different animals' teeth. Children to show the value of *respect* as they listen to each other's ideas.

Key Vocabulary

Anus, blood, blood vessels, canines, carbon dioxide, carnivores, cavities, consumer, cutting, diet, digestion, digestive system, enamel exercise, faeces, fluoride, grinding, gums, heart, herbivore, incisor, large intestine, lifestyle, lungs, molar, mouth, nerves, oesophagus, omnivore, oxygen, plaque, predator, pre-molar, prey, produced, pumps, rectum, rip, tear, chew, grid, cut, saliva, small intestine, stomach, swallowing, teeth, tongue, tooth decay, water

Scientific enquiry - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To identify the different types of teeth in humans and their simple functions

Christian Value: *respect*

2. What drink will affect our enamel the most? - 2 weeks

Children to learn what enamel, cavities and plaque is and how they affect our teeth. Identify how we look after our teeth - brush for two minutes, twice a day, eat a balanced diet, visit the dentist every 6 months, floss, fluoride, mouth wash before rushing not after as it washes away the fluoride. Pose the question - what drink will affect our enamel the most. Give the children access to a variety of drinks - hot chocolate, coffee, squash, pure orange juice, milk, coke etc. Children then to plan experiment, including the question, method, prediction, fair test and create a table to record results. Children to conduct experiment (leave eggs for a week) and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction. E.g. I found out that pure orange juice affected the enamel the most. This happened because it is full of citric acid. My results show that the eggshell had cracked and blistered, cavities. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Set up simple practical enquiries, comparative, and fair tests. Recognise when a simple fair test is necessary and help to decide how to set it up. With help, pupils should look for changes, patterns, similarities, and differences in their data in order to draw simple conclusions and answer questions

LO: To identify the different types of teeth in humans and their simple functions

Christian Value: *respect, friendship*

3. What are the main parts of the digestive system?

Recap - why do we need different types of foods? - keep us healthy. Who can remember the food groups and their functions? Children to learn what the digestive system is and the different parts of the digestive system. Humans digest food. They have a digestive system that allows them to do this. What do you think digest/digestion means? So, what happens when you eat an apple? Take any ideas. Give picture of body with digestive system. Do they know any parts? Do they know the route the food takes? Children to use a model to follow the route our food takes through our body. Children to learn the. Mouth Oesophagus Stomach Small Intestine Large Intestine Rectum and Anus. In books label a body using a word bank of the words above. Children to show the value of **thankfulness** - we are **thankful** for our amazing bodies and how they keep us alive.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To describe the simple functions of the basic parts of the digestive system in humans

Christian Value: **thankfulness**

4. How does food move through the digestive system?

Rap the parts of the digestive system. Watch Operation Ouch on the digestive system. Children to learn the function of each part of the digestive system. Mouth - saliva contains enzymes. Food starts breaking down immediately. Oesophagus - tube to stomach. Stomach - gastric juices start breaking food down. Turns food into liquid mush. Small intestine - absorbs nutrients from food. Large intestine - absorb water and salt. Rectum - anything not absorbed is waste. Tells you that you need to go to the toilet. Anus - releases the waste Children to create the digestive system using tights, plastic food bag, banana, orange juice, cracker and water to practically pass food through the digestive system. Children to show the Christian values of **friendship** and **respect** as they work together. Place the cream cracker, banana and orange juice (which represents stomach acid) into the plastic sandwich bag. The bag represents the stomach. Add the water, which represents saliva. Squeeze all the air out and seal the bag. Squeeze the bag for 2 or 3 minutes to smash up the mixture inside. This mimics the action of our stomach walls breaking down food. Place the plastic sandwich bag and stocking over a

tray. Cut a small hole in the corner of the bag and transfer the contents into the stocking. The stocking represents the small intestine. Squeeze the food through the stocking. The liquid that ends up in the tray represents the nutrients that are absorbed by the body and used for growth and energy. The food that remains inside the stocking represents the waste that can't be absorbed by the body. Cut the toe off the stocking and squeeze the remaining food out of the end and into the plastic cup. The cup represents the large intestine. Finally, push the food (waste) through the bottom of the cup. This represents going to the toilet. Children to then write an explanation of how food travels through our digestive system and what happens at each stage.

Scientific enquiry - Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To describe the simple functions of the basic parts of the digestive system in humans

Christian Value: respect, friendship

5. Can you construct a food chain?

Children to learn what a producer, predator, consumer and prey are. Producer - an organism which produces its own food through photosynthesis. Predator - an animal that hunts and feeds on other animals is a predator. Prey is the organism that a predator eats. A consumer is a living thing that eats other plants and animals. Show the children a simple food chain. What does it tell us? Using animal photo cards, what food chains could they create? Record in books. Can they label on the producer, prey, predator and consumer? Children to show the Christian value of thankfulness - we are thankful for all living things and they ensure our and each other's survival.

Scientific enquiry - Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To construct and interpret a variety of food chains, identifying producers, predators and prey.

Christian Value: thankfulness

Feedback:

Year 4
States of Matter
Chemistry

Knowledge to be taught:

- To compare and group materials together, according to whether they are solids, liquids or gases
- To 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)
- To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Lesson Guide

1. *What is a solid, liquid and gas?*

Children to learn what a solid, liquid and gas are. Ask the children to collect different objects from around the room and classify them. How have you grouped them? What are their properties. What do we mean by a solid and a liquid? Are any of your objects solid? Liquid? Children to learn that there are three states of matter - solid, liquid and gas. A solid is a shape that keeps its shape unless a force is applied to it. A solid can be cut, squashed or torn. Solid have a fixed volume. A liquid takes the shape of the container it is in. they have a fixed volume. Liquids can be poured. A gas has no fixed shape or volume. They spread out to completely fill the container or room they are in. Using pictures, children to classify into the three groups and record in books. Match the properties to the correct state using the statements from above.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To compare and group materials together, according to whether they are solids, liquids or gases

Christian Value: *respect*

Key Vocabulary

Air, boil, boiling point, carbon dioxide, change state, condense/condensation, cooling, crystals, degrees Celsius, dissolve, evaporate/evaporation, gas, liquid, solid, freeze, grains, heated, helium, ice/water/steam, melting point, oxygen, pour, precipitation, properties, solidify, states of matter, temperature, thermometer, water cycle, water vapour

2. *What are the properties of solids, liquids and gases?*

Children to recap solids, liquids and gases. Children to learn what the particles of each states of matter would look like. Discuss that all materials are made out of tiny particles that are so small we can't see them, even with a microscope. The position and behaviour of particles are different in solids, liquids and gases.

Drama activity of the particles. Children to show the value of **friendship** during the drama activity. In solids the particles are closely packed together and vibrate on the spot. In liquids the particles are close together but random and can move over each other. In a gas the particles are spread out and can move quickly in all directions. Children to match states of matter to their particles and properties. What is different about sand/salt/sugar? Children to learn that some solids behave like liquids, e.g., sand salt

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Talk about criteria for grouping, sorting, and classifying; and use simple keys

LO: To compare and group materials together, according to whether they are solids, liquids or gases

Christian Value: **friendship**

3. **How does jelly change state?**

Children to learn how to read a thermometer. Give the children a set of thermometers to read with different scales and positive and negative temperatures. Children to record what temperatures they are. Why do we use thermometers? What makes materials change state? Children to learn about freezing and melting. Discuss the melting/freezing points of different materials. Pose the question - which temperature is best for melting chocolate? Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL!

conclusion - point, evidence. E.g. I found out the warm water melted the chocolate quickest. My results show after 5 minutes the chocolate in warm water had melted. Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Set up simple practical enquiries, comparative, and fair tests
Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately. Take accurate measurements using standard units

LO: To observe that some materials change state when they are heated or cooled.

Christian Value: respect, friendship

Do all solids melt at the same temperature?

Children to learn how to read a thermometer. Give the children a set of thermometers to read with different scales and positive and negative temperatures. Children to record what temperatures they are. Why do we use thermometers? What makes materials change state? Children to learn about freezing and melting. Discuss the melting/freezing points of different materials. Pose the question - which temperature do different materials melt - wax chocolate, ice. Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence. E.g. I found out the warm water melted the chocolate quickest. My results show after 5 minutes the chocolate in warm water had melted Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment.

Scientific enquiry - Set up simple practical enquiries, comparative, and fair tests
Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately. Take accurate measurements using standard units

LO: To research the temperature at which this happens in degrees Celsius (°C)

Christian Value: respect, friendship

What is evaporation?

4. Where will socks dry quickest?

What can you remember about solids liquids and gases? - tell your partner 5 things. Children to learn what evaporation is. Go outside, make a puddle and chalk outline, or chalk an outline of existing. Look at the chalk outline of a puddle, what will happen to the water? Where will it go? Draw out the word "evaporation" when a liquid turns into a gas. Discuss heat and air flow. What other examples of evaporation can you think of? Pose the question - where will our socks dry quickest? Go through fair testing in detail. Children then to plan experiment, including the question, method, prediction, fair test and create a table for the results. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Set up simple practical enquiries, comparative, and fair tests. Recognise when a simple fair test is necessary and help to decide how to set it up

LO: To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Christian Value: *respect, friendship*

5. Where will socks dry quickest?

Set up the experiment. While the socks are drying children to learn what condensation is. What does a boiling kettle show? Liquid going into gas (steam) how is it happening? What is it called? Condensation. What happens if steam hits a cold surface? - it cools, and water is formed - called condensation. Demonstrate this using a bowl of boiling water, cling film and ice cubes. Children to observe what happens and draw a diagram. can they label steam, evaporation, condensation hot water, cold surface?

Look at the socks. Where did they dry the quickest? Children to record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction, link to original question, next time I would investigate. Children to show the

Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. Make systematic and careful observations

LO: To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Christian Value: *respect, friendship*

What is condensation?

6. What is the water cycle?

Children to recap what evaporation and condensation is. Children to learn what the water cycle is - evaporation, condensation, precipitation and collection. Complete a thinking frame, researching the different stages using DKFindout. Present findings to the class. Christian value of *thankfulness*- *thankful* for the water cycle. Without it we wouldn't be alive.

Scientific enquiry - Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Christian Value: *thankfulness*

Feedback:

Year 4
Sound
Physics

Knowledge to be taught:

- To identify how sounds are made, associating some of them with something vibrating
- To recognise that vibrations from sounds travel through a medium to the ear
- To find patterns between the pitch of a sound and features of the object that produced it
- To find patterns between the volume of a sound and the strength of the vibrations that produced it.
- To recognise that sounds get fainter as the distance from the sound source increases

Lesson Guide

1. How are sounds made?

Children to learn what a sound is. What is sound? As a table write on large paper what they already know. Watch this clip <https://www.bbc.com/bitesize/clips/zqtxpv4>. Watch the clip again and this time ask the children to write down all the words that are used to explain how sound can be made. Explain that sounds are created when something vibrates. Children act out vibration, and feel their vocal cords vibrating as they speak. Children work in groups to place rice on a drum to see the vibrations when they bang the drum. They will use a tuning fork and place it in water to see the vibrations through the water. Pose the question - which sound will be the loudest or where in the school is the loudest. Children then to plan experiment, including the question, method, prediction, fair test and create a table to record results. Conduct the experiment recording results using data loggers. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction. Egg My experiment shows the loudest activity was clapping. This is because the vibrations from clapping were the biggest. My results show that clapping recorded *** on the data logger. My prediction was wrong because I thought ____ would be the loudest. Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Make systematic and careful observations. Raise their own relevant questions about the world around them. Should be given a range of scientific experiences including different types of science enquiries to answer questions

Key Vocabulary

Bang, blow, decibels, direction, ear, ear canal, ear drum, echo, fainter, hard, high, instrument, insulation, louder, low, music, nearer, noise, note, percussion, pitch, pluck, quiet, rattle, ring, shake, silence, soft, solid/liquid/gas, sound, sound source, sound wave, soundproof, strings, strength of vibration, tension, tight, travel, vibrate/vibration, volume, whisper, woodwind

LO: To identify how sounds are made, associating some of them with something vibrating

Christian Value: respect, friendship

2. How does sound travel?

Children to recap that sound is made by something vibrating. Children to learn that these vibrations travel through the air to our ear and that sound can travel through solids, liquids and gases. Children to learn that the louder the sound bigger the amplitude/vibration and the quieter sound smaller amplitude and vibration. In three children to create a factual programme on how sound travels using the template given as prompts. Children to show the Christian values of friendship and respect as they work together to create their sound programme and listen to other groups.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To recognise that vibrations from sounds travel through a medium to the ear

Christian Value: respect, friendship

3. How can we change the pitch?

Recap what they have already learnt about sounds - sounds are made by something vibrating. Sounds can be loud or quiet. Bigger vibrations make louder sounds and smaller vibrations make quieter sounds. (amplitude). (Loud sound, big vibrations, big amplitude/ quiet sounds, small vibrations, small amplitude) Sounds travel through solids and liquids and gases. Children to learn that sound can be changed by altering the pitch. What does this mean? High and low describe the pitch of sound the pitch is different to amplitude. Amplitude is a measure of how loud or quiet a sound is, and pitch is a measure of how high or low a sound is. High sounds can be quiet or loud and low sounds can be quiet or loud too. we are going to explore how high and low sounds are made and see if you can spot any patterns when looking at how different instruments can create sounds of different pitches. Using recorders, guitars, glockenspiels, children to explore how to

alter the pitch. Discuss findings. Children to create a set of panpipes using straws. How can we use the panpipes to create sounds of different pitches? Children to be **thankful** that we all have the ability to hear the different pitches the panpipes make.

Scientific enquiry - With help, pupils should look for changes, patterns, similarities, and differences in their data in order to draw simple conclusions and answer questions

LO: To find patterns between the pitch of a sound and features of the object that produced it

Christian Value: **thankfulness**

4. Which shaker will produce the loudest sound? - 2 lessons

What can the remember about sound - sound is made by something vibrating. These vibrations travel through the air to our ear and that sound can travel through solids, liquids and gases. Pose question - what shaker will produce the loudest sound? What variable could we change? Materials Size of shakers Amount of material? Children then to plan experiment, including the question, method, prediction, fair test and create a table to record results. Then make their shaker. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction. E.g. I found out that the shaker with the rice in was the loudest. This is because rice is the hardest solid and can create the loudest vibrations. My results show this because rice recorded ___ dB Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Take accurate measurements using standard units. learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately. Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data

LO: To find patterns between the volume of a sound and the strength of the vibrations that produced it.

Christian Value: *respect, friendship*

Feedback:

Knowledge to be taught:

- To identify common appliances that run on electricity
- To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- To 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
- To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- To recognise some common conductors and insulators, and associate metals with being good conductors.

Lesson Guide

1. What is the difference between mains and battery appliances?

Children to learn what an appliance is. - a device or piece of equipment designed to perform a specific task. Children to sort pictures of appliances. How have they done it? Children to learn what mains and battery electricity is. Children to classify appliances into these groups. Are there any that could be in both groups? E.g. a toothbrush can be manual or electric. Use a Venn diagram to record appliances into those which use mains electricity, battery powered and those which can be both. Discuss the dangers of electricity. Children to learn how we stay safe around electricity - keep liquids away from electricity, fingers out of plug sockets, turn off device when not using it, make sure there are no exposed metal wires, don't overload a socket, or leave wires on the floor. Children to create a poster highlighting the dangers of electricity. Children to be **thankful** for how electricity has improved our lives and made living easier.

Scientific enquiry - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

LO: To identify common appliances that run on electricity

Christian Value: **thankfulness**

2. What is a circuit?

Children to learn what a circuit is - a complete path around which electricity can flow. Give the children equipment and ask them to make the bulb light up. Children to show the value of **perseverance** when trying to get the bulb to light up. What do

Key Vocabulary

Appliances, device, battery, battery holder, break, brighter, dim, bulb, buzzer, cell, circuit, circuit diagram, closed/open circuit, complete circuit, components, conduct, conductor, connect/connection, crocodile clip, electrical conductor/insulator, electricity, insulator, leads, light, mains, metal, motor, plastic, plug, positive/negative, power, safety, socket, switch, volume, wire

you need to do to make it work? What are each of the components called? Children to learn what the symbol of each component is and how to draw the circuit they have created.

Scientific enquiry - Should be given a range of scientific experiences including different types of science enquiries to answer questions

LO: To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

Christian Value: Perseverance

3. . What happens if you add more cells to a circuit?

Children to learn that batteries have different voltages. Look at different types of batteries, read voltage on the side. Explain batteries have different amounts of power. Look at the volts and what the number means - the bigger the number the more powerful they are. Have a closer look at the battery it has 2 terminals positive and negative when they work, they need to be connected positive to a negative (just like magnets attract to opposite poles.) Do you know any batteries that you would use at home? Why do torches need 2 batteries? What difference would just having one battery make? Help - an electrician is needed - using diagrams of different circuits, children to predict if they will or will not work. Use the equipment to answer the questions and record results in a table. Which did or didn't it work? What do you need to do to make it into a complete circuit?

Pose the question - what happens if you add more cells to a circuit? Children then to plan experiment, including the question, method, prediction, fair test and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction. I found out that if you add more cells to a circuit the bulb gets brighter. This is because there is more power in the circuit. My results show that cells made the bulb brighter. My prediction was... Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment.

Scientific enquiry - Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Set up simple

practical enquiries, comparative, and fair tests. Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.

LO: To 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

Christian Value: respect, friendship

4. What is the function of a switch?

What circuit can you think of that have a bulb or a buzzer or a motor in? - doorbell, lamp, drill. Children to learn where we would find a circuit with a switch. Why do some circuits need a switch - you wouldn't want your doorbell to go off constantly or the lights to always be on. Learn what a switch is and what the symbol looks like. Why is there a gap of the switch is off? Incomplete circuit means the electricity can't pass through therefore the switch is off. What switches can you think of? Children to make their own using foil, paper clips split pins and card. Add them to a simple circuit to see if they work. Draw their circuit including switch in books using symbols. Does it matter where the switch goes in the circuit? Investigate. Children to be thankful that switches allow us to turn appliances off to conserve electricity and save our environment.

Scientific enquiry - Raise their own relevant questions about the world around them with help, pupils should look for changes, patterns, similarities, and differences in their data in order to draw simple conclusions and answer questions

LO: To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

Christian Value: thankfulness

4 What is the difference between a conductor and an insulator?

On the board show symbols. What do the symbols mean? Using whiteboards can the children draw a simple circuit? Children to learn what a conductor and insulator is. Some materials let electricity pass through them easily. These materials are known as **electrical conductors**. Some materials do not allow electricity to pass through them. These materials are known as **electrical insulators**. Pose the question that Ernie needs to get new wire as it is so expensive - he needs some new material for wire. Children to investigate different materials that he could use. Children then to plan experiment, including the question, method, prediction, fair test and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction. E.g. I found out that foil would be a good material to use for a wire. This is because it is a conductor as it is made of metal. My results show that the bulb lit up when the wire was metal. My prediction was... Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them

LO: To recognise some common conductors and insulators, and associate metals with being good conductors.

Christian Value: **respect, friendship**

Feedback:

Knowledge to be taught:

- To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- To describe the life process of reproduction in some plants and animals.

Lesson Guide	Key Vocabulary
1. How do plants reproduce asexually? Children to learn asexual and sexual reproduction. Asexual reproduction is where there is one parent, and the offspring is identical to its parent. Sexual reproduction is where there are two parents, and they are not identical to their parents. Children to also learn the male and female parts of a plant. Male - anther, filament and pollen. Female - stigma, stamen, ovules/ovary. Create a flap book on the female parts and a diagram of the male parts. Explain the function of each part. Stigma - It is sticky so it can catch grains of pollen. Style - Pollen travels down the style in the ovary. Ovary - Is where the seed grows. Anther - makes the pollen. Pollen - it is a fine yellow powder which contains the male gametes (sex cells). Filament - the filament holds up the anther. Children to respect the value of plants and how they keep us alive. Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs LO: To describe the life process of reproduction in some plants and animals. Christian Value: respect	Adolescent, adult, amphibian, anther, asexual reproduction, baby, bird, birth, bud carpel, chick, chrysalis, cross pollination, death, egg, elderly, embryo, fertilisation, filament, fish, fledging, froglet, germination, gestation, growth, insect, invertebrates, larva, life cycle, live young, mammal, metamorphosis, ovary, petals, pollen, puberty, pupa, reproduction, reptile, seed dispersal, seed formation, sexual reproduction, stamen, stigma, style, tadpole, teenager, toddler, vertebrates
2. What are the lifecycles of the different mammals? Children to learn the key features of a mammal - feed milk from the mother and warm blooded. Children to also learn the three different types of mammals - marsupials, placentals and monotremes and what the key features of each of these groups are. Children to persevere when understanding that there are three types of mammals. Marsupials - their young are born incompletely developed. They are then carried and fed in a pouch on the female's stomach until they are fully developed. Monotremes: their young hatch from eggs. Placentals: their young grow inside the female's body and are born fully developed. What type of mammal is a rabbit? Go	

through the stage of a rabbit's life cycle. Children to draw lifecycle of a rabbit in their books. Look at a platypus and a kangaroo. What are their lifecycles?

Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment

LO: To describe the differences in the life cycles of a mammals.

Christian Value: Perseverance

3. What is the lifecycle of a bird?

Children to learn the different parts of an egg by cracking an egg open. Highlight that this is not a fertilised egg. What would happen if it was? Children to then learn the lifecycle of a bird. Egg - chick - grows and develops - adult reproduces. Compare the lifecycle of a bird to that of a human by identifying two similarities and two differences. Children to be thankful for the amazing world we live in.

Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas

LO: To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Christian Value: thankfulness

4. What is metamorphosis?

Children to draw the lifecycle of a butterfly. Identify that a butterfly goes through a metamorphic change. Children to learn what this means and identify other animals / insects that go through the stage of metamorphosis. Children to focus on newt, frog and dragonfly. Using a text children to find the relevant information to create a lifecycle of one of the above in their books. Compare the different lifecycles taught throughout the unit and write in their book's similarities and differences. Assess their understanding. Children to be thankful for the amazing world we live in.

Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas

LO: To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Christian Value: <i>thankfulness</i>	
1. <i>What are differences and similarities between life cycles of a mammal, an amphibian, an insect and a bird?</i> Go over what lifecycles we have already looked at - flick through their books to see if they can find any. What animal groups are they from? Humans - mammals Rabbit - mammals Bird - bird Butterfly/ dragon fly - insect Frog/ newt - amphibian Have a different animal lifecycle on each table. Children to go around and add something they have found out from their science book onto the paper in the middle of the table. Feedback and share what facts they have found out. Today we are going to compare these lifecycles. Show children the table they are going to fill in. and make sure the children label the different animal groups with an animal. Model how they will fill in the table. Children to fill in their tables - haps/maps and laps to have slightly different boxes and to answer questions after they have filled in their table. <i>Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</i> <i>LO: To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</i> Christian Value: <i>thankfulness</i>	
Feedback:	

Year 5 Animals including Humans <i>Biology</i>	
Knowledge to be taught: To describe the changes as humans, develop to old age.	
Lesson Guide	Key Vocabulary
1. <i>What is the human timeline?</i>	

Children to learn the different stages of a human lifecycle. Fertilisation - infancy - childhood - adolescence - early adulthood - middle adulthood - late adulthood. They also need to understand what the body looks like at each of the stages and what they can do. E.g., toilet training, feeding themselves, becoming a parent. Children to create a human timeline in their books. Annotate the ages that these stages occur at and what accomplishments/changes can be had at these stages - puberty, menopause. Children to **respect** the importance of life.

Scientific enquiry - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas

LO: To describe the changes as humans, develop to old age.

Christian Value: **respect**

2. Which graph would be suitable to display data on human growth?

Recap what the stages of humans are and the changes they go through. What is the difference between data and information? Data is the figures and information is what we can interpret from the data. Children to learn that the growth is different for males and females when they are babies. Children to also learn that there are different types of graphs and that they are suitable for different types of data. Look at a pictogram, bar graph, pie chart and line graph. Which would be suitable to represent the height growth of male and female babies? Children to create a bar graph and a line graph on the height of growth for males and females. Children need to choose the scale on their graph and need to include labels on axis and a title. Which do they find the easiest to interpret? Why?

Children to **respect** the importance of life.

Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas

LO: To describe the changes as humans, develop to old age

Christian Value: **respect,**

Feedback:

Adolescent, adult, asexual reproduction, baby, birth, death, egg, elderly, embryo, fertilisation, gestation, growth, life cycle, live young, mammal, ovary, puberty, reproduction, sexual reproduction, teenager, toddler, vertebrates

Year 5
Properties and Changes of Materials
Chemistry

Knowledge to be taught:

- To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- To demonstrate that dissolving, mixing and changes of state are reversible changes
- To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Lesson Guide

1. What are the properties of materials?

Explore different materials using feely bags. What words can be used to describe them? What are their properties? Focus on key scientific vocabulary or improve basic vocabulary - translucent, opaque, transparent, rigid, flexible, absorbent, permeable, durable etc. Children to create a glossary of scientific vocabulary. Apply to materials in feely bags. Can they improve how they would describe the materials? Children to be *thankful* to the many scientists who developed or discovered these materials.

Words on the table - spider diagram what they mean - focus on ones they don't know. Then properties of objects - paper chains. E.g. window - transparent - rigid

Scientific enquiry - Use their science experiences to explore ideas and raise different kinds of questions

LO: To identify and describe properties of materials.

Christian Value: *thankfulness*

Key Vocabulary

Attract, burning, carbon, Celsius, change of state, chemical change, condensing, degrees, dissolve, effervescent, electrical conductivity/insulation, evaporating, filtering, freezing, gas, heating, impurity, insoluble, irreversible, liquid, magnetic, melting, metal, mixture, new material, particle, plastic, precipitate, product, reaction, pure, repel, reversible change, rusting, separate, sieving, solid, solubility, soluble, solution, steam, substance, thermal conductivity, vapour, wood

2. Why are a materials properties important?

Pose the question 'what if an umbrella was made of glass?' discuss the positives, negatives and interesting points for this question. Children to learn that materials properties are important as it ensures we select a material that is fit for a purpose. Experiment into materials transparency, magnetism, hardness and permeability.

Children to draw a table in their books to record their results. Which would be a good material for a house? Why? Children to show the Christian values of *friendship* and *respect* as they work together to conduct their experiment.

Scientific enquiry - Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why

LO: To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Christian Value: *respect, friendship*

3. How could we separate solids using sieving?

Recap what a solid, liquid and gas are. Children to learn that some solids can be separated. Disaster - solids have been mixed and need separating. Children to use equipment to separate sand, paper clips, gravel and marbles. What are their properties and how can we use this knowledge to help us separate the materials? Children to record their process of separation in a flow chart. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs

LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Christian Value: *respect, friendship*

4. How could we separate solids using filtration?

How did we separate our solids last time - sieving. Children to learn that a mixture is where two or materials are mixed together but can be separated. Show

the children sand and water mixed together. Can these be separated by sieving? Children to learn what filtration is. Explore filter paper by the sand and water. Children to draw diagrams in their books to show how they separated the sand from the water. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed

LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Christian Value: *respect, friendship*

5. *Who can make the cleanest water?*

Assessment of separating mixtures. Children to use the skills learnt during the sieving and filtration lesson to answer - what is the best way to filter dirty water? Give the children a bowl of dirty water containing mud, stones, leaves and water and a range of equipment including sieves, spoons, filter paper, funnels. Children to try and get the cleanest water. How did they do it? Did the order matter? Verbally share what they found out. Highlight that the water we drink normally goes through special water filter systems to get rid of harmful bacteria. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make their own decisions about what observations to make, what measurements to use and how long to make them for

LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Christian Value: *respect, friendship*

6. *What is dissolving? How can you separate a soluble solid from a solution?*

Explore which solids dissolve. If they do it means they are a soluble solid. Children to learn how to separate a soluble solid from a solution. What do these words mean? Pose the question - can you retrieve a soluble solid from water? Children then to plan experiment, including the question, method, prediction, fair test

and accuracy and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction, link to original question, next time I would investigate. E.g., We found out you can retrieve a soluble solid. From our results you can see the salt left in the bowl but not the water because it has evaporated. My prediction was incorrect Therefore, if you evaporate the water, you will get back a soluble solid. Next time I would like to test other liquids/ other soluble solids Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately

- LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution

Christian Value: **respect, friendship**

7. **What is an irreversible and reversible change?**

Children to learn what is meant by a reversible and irreversible change. A reversible change means you can get it back - ice melts to water, freeze to get back to ice. Irreversible change means you can't get it back - bread cooked toast, potatoes peeled, egg cooked. Look at a cooked egg - chemical reaction occurred. Its irreversible. Look at burning. What reaction is it? It is combustion. Highlight an irreversible reactions - a new product is formed; this can be a gas or a new solid or liquid. A gas formed in a liquid is easy to see, it forms lots of bubbles. - a temperature change occurs. Show the children how to do an experiment - chemical reaction. Show gas produced. Pose the question - Does the amount of bicarbonate of soda affect the amount of gas produced? Children to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to conduct experiment and record results in their tables.

What have you found out? Children to show the Christian values of <i>friendship</i> and <i>respect</i> as they work together to plan and conduct their experiment. Scientific enquiry - Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Make their own decisions about what observations to make, what measurements to use and how long to make them for LO: To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda Christian Value: <i>respect, friendship</i>	
Feedback:	

Year 5 Earth and Space <i>Physics</i>	
Knowledge to be taught: - To describe the movement of the Earth, and other planets, relative to the Sun in the solar system - To describe the movement of the Moon relative to the Earth - To describe the Sun, Earth and Moon as approximately spherical bodies - To use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.	
Lesson Guide	Key Vocabulary
1. <i>What shape are the Earth, sun and moon?</i> What shape is the Earth? Children to learn that throughout time people have changed their views on whether the Earth is spherical. In the past they thought the Earth was flat. Look at the reasons why people thought this. Then talk about the evidence that shows that it is spherical - Aristotle. E.g., the hull of a boat going over the horizon when it gets further away, constellation of stars being different if you are in a different place of Earth to someone else (we don't all see the same constellations at the same time) Children to draw a diagram to prove that the	Dwarf planet, axis, block, direction, Earth, Earth's rotation, east, galaxy, gravitational force, hemisphere, Jupiter, light travels, lunar calendar, Mars, Mercury, meteor Moon, Neptune, night and day, north orbit, phases of the moon, planets, Pluto, revolve, rotate/rotation, Saturn, shadow, solar

Earth is spherical. Children to show **respect** to the scientists that **persevered** to make the discovery and prove evidence that the earth is spherical.

Scientific enquiry - Talk about how scientific ideas have developed over time.

Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

LO: To describe the Sun, Earth and Moon as approximately spherical bodies

Christian Value: **Perseverance, respect**

system, sphere/spherical, south, spin, sun, sunrise, time zones, Uranus, Venus, west

2. **What are the planets in our solar system?**

Children to learn the planets in our solar system, use a mnemonic to help. My very excited monkey just sits under noses. Use different fruits to represent the different planets so the children can see how they vary in size. Children to draw the solar system in books. Children to learn the difference between orbit and rotate. Orbit is where the Earth moves in a curved path around the sun. Rotate is where the Earth spins/rotates on its own axis. This gives us night and day. Children to show **respect** to the scientists that **persevered** to make the discovery and prove evidence of the Earth's movements.

Scientific enquiry - Identify scientific evidence that has been used to support or refute ideas or arguments

LO: To describe the movement of the Earth, and other planets, relative to the Sun in the solar system

Christian Value: **Perseverance, respect**

3. **How does the moon move in relation to the Earth?**

Children to learn that the Earth rotates (spins) on its axis. It does a full rotation once in every 24 hours. At the same time that Earth is rotating, it is also orbiting around the sun. Daytime occurs when the side of Earth is facing towards the sun. Night occurs when the side of the earth is facing away from the sun, complete a drama activity to show this using three balls. Use balls of differing sizes to demonstrate. Show giant yoga ball, tennis ball and marble. Which represents sun, moon and Earth? Use models to explain chart, comparing sizes and movement. Make a model using a paper plate, circle and small circle with a split pin to

demonstrate the orbits and size differences. Can you explain how this model shows the movement of the Earth, sun and moon Children to show **respect** to the scientists that **persevered** to make the discovery and prove evidence of the Earth's movements.

Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas

LO: To describe the movement of the Moon relative to the Earth

Christian Value: **Perseverance, respect,**

4. **Why do we get day and night?**

Children to learn that the Earth rotates, and the sun keeps still. Show the children how we can use the sun to tell the time based on its position in the sky. Where does the sunrise / sunset? The sun rises in the east and sets in the west - it happens every day and the sun appears to move across the sky the same way every day. Use a torch to demonstrate this. Why have the shadows moved? Could this help us tell the time? Children to learn how we get night and day. The Earth orbits the sun once every 365 days and rotates about its axis once every 24 hours. Day and night are due to the Earth rotating on its axis, not its orbiting around the sun. The term 'one day' is determined by the time the Earth takes to rotate once on its axis and includes both daytime and night time. Draw a diagram in books showing this. Children to show **respect** to the scientists that **persevered** to make the discovery and prove evidence of the Earth's movements.

Scientific enquiry - Identify scientific evidence that has been used to support or refute ideas or arguments

LO: To use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.

Christian Value: **Perseverance, respect,**

Feedback:

Year 5
Forces
Physics

Knowledge to be taught:

- To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- To identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Lesson Guide

1. *How can we measure gravity?*

Children to learn who Isaac Newton and his discovery of gravity. Discuss that gravity is a pulling force exerted by the Earth. It pulls in the direction of the Earth and reaction force is exerted by the ground. These forces are equal so that is why we stand on the Earth. How would we draw a picture to show gravity? Children to have a go in their books - share examples make sure the children have labelled this correctly with the opposing arrow. What is the difference between mass and weight? The weight of an object is caused by gravity pulling it down and is measure in Newtons. Mass is a measure of the amount of 'stuff' inside an object and is measured in kg. Show the children a force meter and explain we can use it to measure the strength of gravity on an object (weight) in Newtons. Using different objects children are to measure the gravity of the objects using a Forceometer. Record results in a table. Once the children have worked in groups to measure their objects children to swap groups to discuss their results with other groups - which object had the most/ least force etc. were there any surprising results? Write a conclusion e.g. I have discovered the object with the largest weight was _____. This can be seen in my results as it shows the _____ was ____N Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Talk about how scientific ideas have developed over time

Key Vocabulary

Air resistance, balance Earth, falls, floats, force, friction, gears, gravity, levers, magnetic force, mass, mechanisms, Newton, pulleys, ramps, springs, stationary, still, transfer, upthrust, water resistance, weight, forcemeter, Newtonmeter (N)

LO: To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

Christian Value: respect, friendship

2. What makes a good paper helicopter?

Children to learn what air resistance is. Talk about Galileo's theory and highlight that objects fall at the same speed regardless of their mass (weight) because gravity pulls them down at the same speed. But they DO NOT all land at the same time due to air resistance. Children to be given a template and create a paper helicopter. How could we make a good helicopter? Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction, link to original question, next time I would investigate E.g. I found out that wrapping paper made a good helicopter. This is because it had the most air resistance. My results show that it stayed in the air the longest. My prediction was.... So, if you want a good paper helicopter make it out of wrapping paper. Next time I would like to investigate if the size of the helicopter would affect how long it stays in the air. Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment.

Scientific enquiry - Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Take repeat measurements where appropriate

LO: To identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Christian Value: respect, friendship

3. What surface will create the least amount of friction for a roller-skate?

Ask two children to hold ends of skipping rope. What does the rope look like, with no pulling force? How can we make the rope straight? Establish that a pulling

force is needed. Do both children need to pull? What happens if one pulls harder? What would happen if they pull with the same force? If both the children and the rope are static, then the forces are balanced. If the rope moves left or right, the forces are unbalanced. What is friction? Show the statements which do they think is true or false? Watch videos <https://www.bbc.com/bitesize/articles/zxqrdxs> show example using toothbrushes to recap the meaning of friction on pic Explain friction and go over helpful and unhelpful friction We are going to carry out an experiment Haps maps question What surface will have the least amount of friction for the roller-skate? Laps What surface will have the least amount of friction for the roller-skate to go faster? Go over what surfaces we could use. Do a fair test and do a prediction Pick 4 surfaces and fill in results table. Table/ carpet/ gravel/concrete/ grass/ fabric (jumpers etc) Carryout investigation

Scientific enquiry - Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate

LO: To identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Christian Value: respect, friendship

4. How can the shape of an object affect water resistance?

Ask the children to imagine that they are standing in water up to their necks, how does it feel as they start to move around? It's hard work - there is a lot of water resistance pushing against you Children to learn what water resistance is - Whenever an object moves through water, it experiences the force of water resistance. Water resistance **pushes** objects back, making it hard for them to move through water Do you know if there is a way to reduce the effects of water resistance/ make it easier to move through water? Become more streamlined. What does that mean? It means it can move through the water (or air) without experiencing much water resistance (or air resistance) Can you think of any objects/ things/animals that may be streamlined? Provide the children with two bits of modelling clay that weigh the same. How could we change the effect water resistance has on these bits of modelling clay? Change their shape. Children to investigate the effects of water resistance on different shaped objects. Does it matter

which way around the shapes are when they are dropped in? Emphasise to the children an object with a lot of water resistance will sink slowly because it can't move through the water easily and an object that does not create a lot of water resistance will sink quickly because it can move through the water easily. Children to create two objects - one they think will sink the quickest and one the slowest. Children to draw table and write prediction. How will we know which one is best? Children to conduct experiment and record in table. How could we make our results more accurate? Repeat testing. What have you found out? What would happen if you filled the cylinders with other liquids? Would your results be the same? What about oil? Syrup? How does it feel now? Why is it different? there will be more resistance as the substances are thicker therefore harder to move through. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed

LO: To identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Christian Value: *respect, friendship*

5. What is a mechanisms and why do we use them?

Children to learn what a mechanism is - a lever, pulley or gear. Look at where we find these in everyday life, e.g., blind, toilet. Look at different mechanisms. What mechanisms are in a watch? What about a bike? Design a machine that uses at least one of these mechanisms. Draw and annotate in books. Share inventions. children to be *thankful* at how these inventions have eased our daily lives.

Scientific enquiry - Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results

LO: To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Christian Value: *thankfulness*

Feedback:

Year 6
Living Things and their Habitats
Biology

Knowledge to be taught:

- To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- To give reasons for classifying plants and animals based on specific characteristics.

Lesson Guide

1. *How could we classify animals?*

Show the children a selection of objects, some living and some non-living. How could they be classified. Then ask how we could classify animals. Generate ideas - mammals, amphibians, invertebrate, vertebrates, herbivores, carnivores, exo / endo skeleton etc. Children to learn the importance of Carl Linnaeus and his system of classifying living organisms. Using pictures of different animals discuss how they could be classified. Children to classify the animals into - mammals, amphibians, birds, reptiles, insects, vertebrates, invertebrates, annelids, crustaceans and arachnids. Record the key features of the group e.g., vertebrates have no backbone, amphibians are cold blooded etc. Children to be *thankful* for our amazing world.

Scientific enquiry - Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment

LO: To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals

Christian Value: *thankfulness*

Key Vocabulary

Amphibians, animals, arachnid, bacteria, birds, classification, cold blooded, crustacean, fish, fungi, fungus, insects, invertebrates, keys, kingdoms, live birth, mammals, micro-organisms, mollusc, mushrooms, organism, perennial, annual, biennial, plants, reptiles, vertebrates, warm blooded, worms

2. Can a classification key help us to identify different living organisms?

Children to learn how to create a classification key. Model on the board how to create a classification key using four animals. Highlight that you have to keep asking questions until each animal is classified into their own group is it a mammal? Is it warm blooded? Does it lay eggs? Etc. Children to use the pictures from last session and the information they gathered on the different classification groups and create their own classification keys. Children to be **thankful** for our amazing world and understand we need to look after it.

Scientific enquiry - Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment

LO: To give reasons for classifying plants and animals based on specific characteristics.

Christian Value: **thankfulness**

3. How could we classify plants?

Children to learn the different classification groups of plants - mosses, ferns, flowering plants, grasses. Give the children some pictures of some plants and ask them to sort them into the different groups. Using an iPad children to research the different features of these groups. Children to then use this information to create a classification key on plants. Children to be **thankful** for our amazing world and understand we need to look after it.

Scientific enquiry - Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment

LO: To give reasons for classifying plants and animals based on specific characteristics.

Christian Value: **thankfulness**

4. What are micro-organisms?

Children to learn that micro-organisms are very tiny living things and that we need a microscope to see them. They are all around us and can live in and on our bodies, in the air, water and objects around us. Discuss that microorganisms can be plants (plankton), animals (dust mites) or fungi (mould, yeast and penicillium) children to learn that some microorganisms are harmful and some helpful. and

how they could be classified. Children to set up an investigation into what conditions cause mould to grow. Children to think about which variable they want to change and set up experiment - dark place, warm place, room temperature as the control. Look at the results the following week. Where would it be best to keep our bread. Verbal discussion. Children to show the Christian values of <i>friendship</i> and <i>respect</i> as they work together to plan and conduct their experiment. Scientific enquiry - Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment LO: To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Christian Value: <i>respect, friendship</i>	
<i>What are the five kingdoms</i> LO: To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	
Feedback:	

Year 6 Animals including Humans <i>Biology</i>	
Knowledge to be taught: - To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function - To describe the ways in which nutrients and water are transported within animals, including humans.	
Lesson Guide	Key Vocabulary
1. <i>What are the four chambers of the heart?</i>	

On the board display three systems - skeletal, muscular and digestive. What is the purpose/function of these systems? Introduce circulatory system (heart and blood) and respiratory system (breathing/lungs) Watch Operation Ouch on the heart. What is the job of your heart? The heart pumps blood around your body - How much blood do you think is in the body? - Show 5 litres of red liquid. How does blood flow around the body? Explain blood flows through veins - Children to identify blood veins on underside of lower arm. Anywhere else? Listen to heartbeat using either stethoscope's Identify it is a lub-DUB sound and is the sound made by the heart valves as they open and close. Children to learn that the heart is split into four chambers - the left atrium, right atrium, left ventricle and right ventricle. Discuss that a diagram of a heart is always revered. Children to learn the red side of the heart is oxygenated blood and the blue is deoxygenated. Use Fimo to create a model of the heart and label. When might the heart work faster and why? Children to **respect** their bodies and how it is important to look after it to keep us healthy.

•Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs

LO: To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

Christian Value: **respect**

2. **How does blood travel through our body?**

Look at a diagram of the heart and discuss the four chambers from last time. What does the blue and red symbolise? Discuss how the blood travels around our body. Arteries (red) take blood away from the heart, veins (blue) carry it back to the heart and tiny capillaries link arteries to veins. Use drama to show how blood travels around our body carrying oxygen. Take labels and coloured card. On the floor children to draw a rough heart, that is split into the four chambers and lungs. In lungs put red cards. Discuss with the children the journey of blood - the blood enters the heart - vena cava (deoxygenated) into the right atrium, through to the right ventricle and out through the pulmonary artery to get oxygen from the

Absorbed, artery, blood, blood vessels, capillary, carbon dioxide, circulatory system, deoxygenated blood, diet, exercise heart, heart rate, ingested, lifestyle, lungs oxygen, pumps, red/white blood cells, vein, water

lungs. Oxygenated blood enters the heart through the pulmonary vein, into the left atrium, through to the left ventricle, out through the aorta and then the oxygenated blood delivers oxygen to all the organs in the body. Children to start off with blue cards and move through the heart to the lungs where they'll exchange their blue cards for red (oxygenate blood). Label a diagram of the heart including the left atrium, right atrium, left ventricle, right ventricle, pulmonary vein, pulmonary artery, aorta and vena cava. Children to **respect** their bodies and how it is important to look after it to keep us healthy.

Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs

LO: To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

Christian Value: **respect**

. **How are water and nutrients transported in our body?**

Children to recap the digestive system. What are the different parts? What journey does our food take? Mouth - saliva contains enzymes. Food starts breaking down immediately. Oesophagus - tube to stomach - gastric juices start breaking food down. Turns food into liquid mush. Liver - produces bile. Small intestine - absorbs nutrients from food. Large intestine - absorb water and salt Rectum - anything not absorbed is waste. Tells you that you need to go to the toilet. Anus - releases the waste. Emphasise that our body absorbs nutrients and how they are absorbed in the small intestine. Sort the process into the correct order. Practically look at how water and nutrients are absorbed using skittles (nutrients) and jelly worms (water). Children to **respect** their bodies and how it is important to look after it to keep us healthy.

Scientific enquiry - Talk about how scientific ideas have developed over time
Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

LO: To describe the ways in which nutrients and water are transported within animals, including humans.

Christian Value: **respect**

3. What is blood?

Children to learn what the blood is made of - 55% plasma, 45% red blood cells <1% plasma and white blood cells. Make blood using cheerios, rice crispies, marshmallows, red food colouring and water. Children to draw a diagram about the blood and add any facts they know about the heart. Assess their knowledge. Children to **respect** their bodies and how it is important to look after it to keep us healthy.

Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs

LO: LO: To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

Christian Value: **respect**

4. How do drugs impact our body?

Children to learn what the four groups of drugs are - socially acceptable drugs (coffee, chocolate, cigarettes and alcohol), over the counter medicines (Calpol, paracetamol, cough medicine, piriton), prescribed drugs (antibiotics, anything a doctor gives you a prescription for) and illegal drugs (heroin, cocaine, cannabis). Go through that drugs go in each category and their positives and negatives. Create a poster highlighting the different groups and their positives and/or negatives. Children to **respect** their bodies and how it is important to look after it to keep us healthy and think about the things we ingest.

Scientific enquiry - Identify scientific evidence that has been used to support or refute ideas or arguments

LO: To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function

Christian Value: **respect**

5. How does our diet impact our body?

Recap the food and nutrition groups - carbohydrates, protein, fats and sugars, fruits and vegetables, dairy, fibre, vitamins and minerals. Look at the Eatwell plate and classify foods into the correct groups. Now look at athletes. Would their diet follow the Eatwell plate? Why not? On board display three different diets. Children

to discuss and match athlete to their diet. Can they explain why? - a runner needs more carbohydrates for energy, a body builder needs more protein for muscles. Go through nutrition information of packets of food. Which food has the most salt? Saturated fat? Which would be best for a marathon runner? Why? Using the nutrition cards, children to compare different foods. Children to **respect** their bodies and how it is important to look after it to keep us healthy and think about the things we ingest.

Scientific enquiry - Identify scientific evidence that has been used to support or refute ideas or arguments

LO: To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function

Christian Value: **respect**

6. **How does exercise impact our body?**

Pose the statement - exercise has no impact on the body. Children to prove or disprove this statement. How could you do it? Children to set up their own experiment to either prove it or disprove it e.g., HIIT workout and monitor heart rate. Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to conduct experiment and record results in their tables. What have you found out? Children to draw either a bar or line graph to show results. Children to use their results to write a PEEL! conclusion - point, evidence, explain if they were correct in their prediction, link to original question, next time I would investigate. Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Identify scientific evidence that has been used to support or refute ideas or arguments. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed

LO: To recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function

Christian Value: **respect, friendship**

Feedback:

Year 6
Evolution
Biology

Knowledge to be taught:

- To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Lesson Guide

1. *What is inheritance?*

What do we mean by the word inheritance? Children may think of inheriting money or items when someone has died. Children to learn the scientific meaning of the word inheritance. Highlight that because humans are produced by sexual reproduction and that takes two parents, the offspring will inherit features from both parents. Who do they look like? What features can be inherited by human parents? Talk about the physical features and personality traits. Identify that some things are inherited but some are skills we can learn. E.g., swimming, reading. What about other living things? Plants? Animals? Children to appreciate and be *thankful* for the features they have inherited. Do they inherit features from their parents - yes. Asexual will be identical as there is one parent, sexual will inherit features from both parents. Discuss the subject of crossbreeding. Farmers have been crossbreeding for years why? Look at dogs and the hybrid dogs that have been created by crossbreeding. E.g., Labrador and a poodle are a labradoodle. What features has the labradoodle inherited from the poodle? Labrador? Children to

Key Vocabulary

Adapt/adaptation, advantages, artificial selection, characteristics, competition, differences, disadvantage, environment, environmental conditions, evolution, features, fossils, habitat, identical, inherit/inheritance natural variation, non-identical, offspring, similarities, suited/suitable, survival vary/variation

research a chosen hybrid and identify what features they have inherited from their parents.

Scientific enquiry - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

LO: To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

Christian Value: *thankfulness*

2. *How have humans evolved?*

Match these definitions on the board

- **Adaptation** - How living things are specialised to suit their environment.
- **Evolution** - The process by which living things can gradually change over time.
- **Inheritance** - The process of passing on features from parents to offspring.
- **Species** - A group of living things with very similar characteristics. They can breed together to make more living things of the same type.
- **Variation** - The differences between living things in a species.

Children to learn what evolution means - the process by which living things can gradually change over time. Talk about Charles Darwin. Children to *respect* the discoveries that Charles Darwin made. Using pictures children to order and annotate how humans have evolved.

Who introduced the idea of the theory of evolution - Charles Darwin? Look at pictures of primates. Which kingdom do they all belong to: animal, plant, fungi, protist or bacteria? Are they vertebrates or invertebrates? Which group of vertebrates? Which group of mammals? They all belong to the group we call **primates**. Modern humans have similarities to other primate groups, but there are also some important differences. Show the children the branch of a tree, with its subdivisions. Explain that humans have not descended from gorillas or chimpanzees or any other members of the primate group, but, like the twigs on the branch, we can all be traced back to a common ancestor.

Get the children to lift and swing their arms. Ask: *Can a cat do this? A dog? A cow?* One way we can tell we share a common ancestor with tree dwelling primates is because of the way we can rotate our shoulders in their sockets and our forearms - they are adaptations for climbing and swinging. Watch horrible histories 10mins25-14.39 man evolving (Netflix, series 4 episode 2) Provide children with human evolution cards. Children to order them and match the names. Children to stick in their books but leave room to annotate each picture later. How do we know these changes have occurred? Let's look at Lucy <https://www.youtube.com/watch?v=eFmloRkUcKk> Looking back at the stages of evolution you have stuck in, what are the visible changes you can see as we have evolved? Children to write ideas around / underneath each stage of evolution. (Think skull, spine, brain, kneecaps, pelvis) DNA Quiz - what do we share our DNA with. Is it just humans who have evolved? <https://www.bbc.com/bitesize/articles/z9qs4qt> Plenary Watch video about The Earth's evolution. <http://www.bbc.co.uk/education/clips/zujqycw>

Scientific enquiry - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact Talk about how scientific ideas have developed over time.

LO: To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Christian Value: *respect*

3. *How have living organisms adapted to survive?*

What is adaptation - How living things are specialised to suit their environment. Children to learn about how and why animals have adapted to their environments. Look at different animals. E.g., the bear / polar bear. How have they adapted. Talk about survival of the fittest. I Tell the children that they are going to investigate ducks' beaks to see how they adapt to different island environments like the tortoises in the video. Show the children different 'beak' implements. (Three different sized bulldog clips, spoons, straws, BBQ tongs) and different 'foods' which will be available on each different island. (Water, lentils, pasta, strawberry laces, liquorice

allsorts) Pose the question - Which Island does each duck belong to? How are they going to find out? Set up different food islands - one food sort for each group. In groups children are to each choose one 'beak' (everyone needs different one). The challenge is to see who can collect the most food and they will be the surviving duck - survival of the fittest. Groups to visit each 'island'. Which duck belongs on which island? How have they adapted to survive? Why do we say it is the survival of the fittest? Children to complete duck sheet saying how they have adapted and matching ducks to the island. Look at a bird. How could their beaks adapt to ensure their survival? Draw the beaks onto the birds faces. E.g., a large scooping beak to eat fish. Children to show *compassion* towards animals that have not survived due to being the weaker species.

Scientific enquiry - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

LO: To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Christian Value: *compassion*

4. What can fossils tell us?

What evidence is there that we have evolved? Where do scientists get their evidence from? What are fossils? Why are they important? Look at the different fossils from the Collection. What are they a fossil of? Provide the children with the key so that they can identify what fossil they have chosen. What relation to today's living organisms? Children to complete observational drawings of their fossils and label what they are. Provide the children with an article from evolution news - Tiktaalik crawls into evolution history. Children to highlight the key information about the tiktaalik fossil. Children to then draw and label in their books what a titaaalik would look like. Children to *respect* the fossils from the Collection by observing them carefully and being *thankful* that they allowed us to borrow them.

Scientific enquiry - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas

LO: To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Christian Value: *respect, thankful*

Feedback:

Year 6
Light
Physics

Knowledge to be taught:

- To recognise that light appears to travel in straight lines
- To 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
- 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
- To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Lesson Guide

1. *What is a light source? How does light travel?*

What is a light source? Recap from year three? A light source is something that gives out light. What examples can they think of? What about the moon? Window? Mirror? These are not light sources. Why? Discuss that they reflect the light. Children to learn what is meant by artificial light (torch, lamp, bulb) and what is meant by natural light (sun, fire). In books children to record light sources and identify if they are a natural or artificial light source - quick activity. How does light travel? Children to then learn that light travels in a straight line. How could we prove this statement? Using torches and mirrors, children are to hit a target by reflecting the light. The target will face away from the torch. The children then have to use mirrors to reflect the light back onto the target. How many mirrors do

Key Vocabulary

Absorption, angle, coloured filters, eye, lenses mirror, prism, spectrum, straight

we need? Can we increase the number of mirrors? What happens if we move the target somewhere else? Take photographs. Discuss what the children found out. Identifying that to do this the light travels in straight lines. Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

- Scientific enquiry - Look for different causal relationships in their data and identify evidence that refutes or supports their ideas

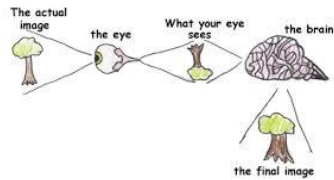
LO: To know which objects are light sources and which are not.

To recognise that light appears travel in straight line.

Christian Value: **respect**, **friendship**

2. How do we see objects?

Recap how light travels - in a straight line. How do we see? Learn how to draw a diagram to show how we see - that light travels in a straight line from a light source to an object, light reflects off object in a straight line into our eyes. Using images of objects, people and light sources, children to draw on the arrows to show how we see things and the direction the light travels. Go through the basic parts of the eye - lens iris, pupil, retina and optical nerve. Watch Operation Ouch where they show the pigs lens. Children to learn that due to the shape of the lens in our eye, that an image is seen by our retina upside down. This image travels down our optic nerve and our brain interprets the image the correct way around. Children to draw a diagram in their book showing how we see. E.g.



Children to be **thankful** that they are all fortunate and can see.

- Scientific enquiry - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs

LO: To 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

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

Christian Value: *thankfulness*

Do shadows have the same shapes as the object that casts them?

collect four objects of different shapes.

Then pose question

Draw objects in books then predict what shape shadows will be by adding it. In books - table with drawn objects, ones with shadow and on next page results.

Need to draw objects on both sides before conducting.

Conduct

Peel

•Scientific enquiry - Use their science experiences to explore ideas and raise different kinds of questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.

LO: To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

3. How does how a light travel affect a shadow's shape?

What is a shadow - a shadow is a dark area caused by something blocking a light source. In pairs give the children a torch. Children to then explore the shape of objects and their shadows using torches. In pairs, children to come up with a question they want to answer on shadows. E.g., Does the position of the torch change the shape of a shadow? Does the distance of a torch affect the size of a shadow? Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

•Scientific enquiry - Use their science experiences to explore ideas and raise different kinds of questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Recognise when and how to set up

comparative and fair tests and explain which variables need to be controlled and why. LO: To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them Christian Value: <i>respect, friendship</i>	
Feedback:	

Year 6 Electricity <i>Physics</i>	
Knowledge to be taught: - To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - To 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 - To use recognised symbols when representing a simple circuit in a diagram.	
Lesson Guide	Key Vocabulary
1. Will the circuit work? Children to learn the symbols used in a series circuit - a bulb, buzzer, cell, battery, switch (on and off) motor and wires. Children to learn what they look like and what their function is. Matching activity - match the pictures to the symbols and their definitions of the components about. Children to be given a bulb, cell and two wires and use the components to create a simple circuit. This has been taught in year 4 so should be a quick activity. Show the children a diagram of a circuit. What features can you see - symbols and shape of the circuit. Talk about a circuit that works is complete as the electricity can flow through the circuit. An incomplete circuit is where there is a break in the circuit so it will not work. Using diagrams of circuits children to predict and then identify whether they will or will not work.	Circuit diagram, circuit symbol, current, fuse, resistance, terminal, voltage, volume, series circuit bulb, wire, buzzer, switch, cell, battery

Justify reasons. Children to then make the circuits in the diagrams to see if they were correct. Children to **persevere** when making the different circuits.

Scientific enquiry - Look for different causal relationships in their data and identify evidence that refutes or supports their idea

LO: To use recognised symbols when representing a simple circuit in a diagram.

Christian Value: **perseverance**

2. Does the number of cells affect the brightness of bulbs or volume of a buzzer?

Two mini experiments in one lesson. Children to recap on the components of a circuit from last time. Show the children the words 'does' 'do' 'would' (or other question words.) What question could we investigate using these words in relation to electricity? E.g., does the number of bulbs affect the brightness? Do the number of cells affect the brightness of a bulb? Do the number of cells affect the volume of a buzzer? Do the number of buzzers affect the volume? Does the type of wires affect the brightness of a bulb or loudness of a buzzer? Children to come up with their own question on electricity that they can investigate. Children then to plan experiment, including the question, method, prediction, fair test and accuracy and create a table to record results. Children to show the Christian values of **friendship** and **respect** as they work together to plan and conduct their experiment.

Scientific enquiry - Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make their own decisions about what observations to make, what measurements to use and how long to make them for. Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs.

LO: To 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.

Christian Value: **respect, friendship**

3. Does it matter where a switch goes in a circuit?

Give children template and make switch. Pose question. full write up. Use motors in threes.

Scientific enquiry -Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed

LO: To 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.

Christian Value: *respect, friendship*

4. *Does the voltage of cells affect the brightness of a bulb or volume of a buzzer?*

Give the children a selection of cells. Allow them to investigate. What information is o them? + - voltage. What is voltage? What does it mean? Children to learn what we mean by voltage of cells. Look at the different voltages. Using what they learnt from their previous electricity experiment, write a prediction on what would happen if they changed the type of cells or the amount of voltage in their circuit. Children to conduct their experiment in pairs. Partners to come together and discuss what they have found out. Children to present findings to the class verbally. Children to show the Christian values of *friendship* and *respect* as they work together to plan and conduct their experiment.

Scientific enquiry - Use their science experiences to explore ideas and raise different kinds of questions. Use oral and written forms such as displays and other presentations to report conclusions, causal relationships, and explanations of degree of trust in results

LO: To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

Christian Value: *respect, friendship*

Feedback: