St Botolph's Church of England Primary School

Science Curriculum – 2024-2025

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 Living Things and their Habitats	Properties and changes of materials	Earth and space Forces
Year 6	Animals, including humans Living Things and their Habitats Evolution and Inheritance		Light Electricity

Progression of Scientific Enquiry

Reception	
Year 1 Year 2	• asking simple questions and recognising that they can be answered in different ways. • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions. • gathering and recording data to help in answering questions
Year 3 Year 4	• 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 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.
Year 5	

Year 6	• 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 • 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.

Progression of Knowledge

National Curriculum statements in red are linked from other topics.

Plants

Reception	• Draw information from a simple map (living things and this habitats) • Explore the natural world around them. (Living things and this habitats) • Describe what they see, hear, and feel whilst outside. (Living things and this habitats) • Recognize some environments that are different to the one in which they live (living things and this habitats) • Understand the effect of changing seasons on the natural world around them. (Seasonal changes)
Year 1	• 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
Year 2	• 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. • identify and name a variety of plants and animals in their habitats, including microhabitats (living things and their habitats)
Year 3	• 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.
Year 4	• To recognise that living things can be grouped in a variety of ways. (Living things and their habitats) • To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Living things and their habitats) • To recognise that environments can change and that this can sometimes pose dangers to living things. (Living things and their habitats)
Year 5	• To describe the life process of reproduction in some plants and animals (Living things and their habitats)
Year 6	• 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. (Living things and their habitats) • To give reasons for classifying plants and animals based on specific characteristics. (Living things and their habitats)

Animals including humans.

Reception	• Talk about members of their immediate family and community. • Name and describe people who are familiar to them. • Recognise some environments that are different to the one in which they live.
Year 1	• 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
Year 2	• 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. • 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 (living things and their habitats)
Year 3	• 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, protection, and movement.
Year 4	• 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.
Year 5	• To describe the changes as humans, develop to old age. • To describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird. (Living things and their habitats.) • To describe the life process of reproduction in some plants and animals (living things and their habitats.)
Year 6	• 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. • 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 (living things and their habitats) • To give reasons for classifying plants and animals based on specific characteristics. (Living things and their habitats)

Living Things and their Habitats

Reception	• Draw information from a simple map. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live.
Year 1	• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (plants) • identify and describe the basic structure of a variety of common flowering plants, including trees. (plants) • identify and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals (animals including humans) • identify and name a variety of common animals that are carnivores, herbivores, and omnivores. (Animals including humans) • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, and mammals including pets) (animals including humans) • Observe changes across the four seasons (seasonal changes)
Year 2	• 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. • Notice that animals, including humans, have offspring which grow into adults. (Animals including humans.)
Year 3	• Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (plants)
Year 4	• 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. • Construct and interpret a variety of food chains, identifying producers, predators and prey (animals including humans)
Year 5	• 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
Year 6	• 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. • To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (evolution and inheritance) • To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Evolution and inheritance)

Evolution and Inheritance

Reception	Recognise some environments that are different to the one in which they live. (Living things and their habitats)
Year 1	
Year 2	• 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 (living things and their habitats) • Notice that animals, including humans, have offspring which grow into adults. (Animals including humans.)
Year 3	• To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (plants) • To describe in simple terms how fossils are formed when things that have lived are trapped within rock (rocks)

Year 4	• To recognise that environments can change and that this can sometimes pose dangers to living things. (Living things and their habitats)
Year 5	• To describe the life process of reproduction in some plants and animals (living things and their habitats)
Year 6	• 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 (and states of matter)

Reception	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
Year 1	• 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
Year 2	• 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
Year 3	• To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (rocks) • To describe in simple terms how fossils are formed when things that have lived are trapped within rock (rocks) • 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 (forces and magnets)

Year 4	• 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. • To recognise some common conductors and insulators, and associate metals with being good conductors.
Year 5	• 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
Year 6	

Rocks

Reception	• Explore the natural world around them. (Living things and their habitats) • Describe what they see, hear and feel whilst outside. (Living things and their habitats)
Year 1	• distinguish between an object and the material from which it is made. (materials) • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock (materials) • describe the simple physical properties of a variety of everyday materials (materials) • compare and group together a variety of everyday materials on the basis of their simple physical properties (materials)

Year 2	• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, and cardboard for particular uses (materials)
Year 3	• 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.
Year 4	
Year 5	
Year 6	• 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 (evolution and inheritance)

Seasonal Changes

Reception	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Under4stand the effect t of changing seasons on the natural world around them.
Year 1	• observe changes across the 4 seasons. • observe and describe weather associated with the seasons and how day length varies
Year 2	
Year 3	• To recognise that light from the sun can be dangerous and that there are ways to protect their eyes (light)
Year 4	
Year 5	• To use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky. (Earth and space)
Year 6	

Light

Reception	• Describe what they see, hear and feel outside,

Year 1	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense (animals including humans) • describe the simple physical properties of a variety of everyday mater4ials (mater4ials)
Year 2	
Year 3	• 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.
Year 4	
Year 5	• 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 (materials)
Year 6	• To recognise that light appears to travel in straight line. • 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

Forces

Reception	
Year 1	
Year 2	• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting, and stretching (materials)
Year 3	• 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.
Year 4	
Year 5	• 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
Year 6	

Electricity

Reception	
Year 1	
Year 2	
Year 3	
Year 4	• 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.
Year 5	

Year 6	• 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.

Sound

Reception	• Describe what they see, hear and feel whilst outside.
Year 1	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense (animals including humans)
Year 2	
Year 3	
Year 4	• 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
Year 5	
Year 6	

Earth and Space

Reception	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside,
Year 1	• observe changes across the 4 seasons (seasonal changes) • observe and describe weather associated with the seasons and how day length varies (seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	• 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.
Year 6	

Unit Planning

Understanding the World	
EYFS UtW 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):	Assessment:
•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.	•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.
•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.	•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?
•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.	•Can children talk about people that they may have come across within their communities?

•Recognise that people have different beliefs and celebrate special times in different ways. •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.	•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? •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	**Chemistry**	**Physics**	**Scientific Enquiry**
-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	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)	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.	-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.	**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.	**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.

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. -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)	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. -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 lives there and people who live there. -Compare this to where we live thinking about; weather & climate, animals who	-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. **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

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. -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)	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. -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.	-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** 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 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.	<u>To observe freezing (linked to Winter).</u> 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. <u>To observe melting (linked to melting chocolate for Easter Rice Krispy cakes).</u> 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. <u>To show care and a respect for the animals in an environment that I have visited (linked to farm trip)</u>	-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. <u>To show care and a respect for the animals in a contrasting environment (Ocean animals)</u> 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

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.

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

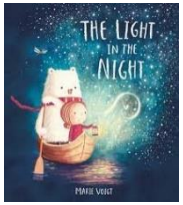
Key Texts

Funny bones by Janet and Allan Ahlberg

Autumn by Ailie Busby

Don't hog the hedge - Twinkl

Light in the night by Marie Voi



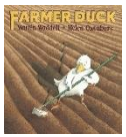
Winter by Ailie Busby

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

Incy Wincy Spider	

Classroom Provision, Enrichment opportunities & 'WOW moments'

Ongoing opportunities throughout the year

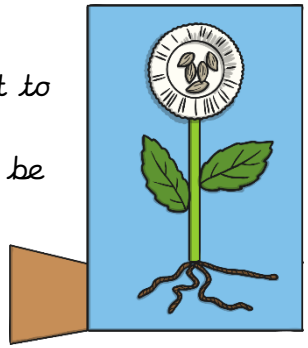
- Daily weather and season through our daily routines
- Discussions about holidays/families from other countries. Weather in those countries.
- Exploring different gradients and speeds when racing cars down ramps. Using materials to change the speeds of cards and discussing 'friction'
- How sound travels 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	Spring Term	Summer 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	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 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	Key Vocabulary
1. What are the parts of a flower? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/mellow-yellow children to discuss what they think is the odd one out – there are no wrong answers. **Learn** Show the children a small plant which you can pull out of soil to show the roots. Do they know any parts of the flower? Give children a picture of a plant to look at on their tables. As a table label the parts they know. Children to learn what the different parts of a flower are – petal, stem, leaf, root. Discuss that we should be thankful for the plants around us as they give us life.  **Respond** Children to create their own flower using green paper/lollipop sticks, real leaves/green card, brown wool, cupcake cases, brown and blue paper. Children to add the labels flower, stem, root, seed and leaves to their created flower. **Reflect** What is it? https://explorify.uk/en/activities/zoom-in-zoom-out/green-pattern It doesn't have a flower. Is it still a plant? Scientific enquiry – Type of scientist – To observe closely FROGS =grouping and classifying LO: to name and describe the basic parts of a flowering plants. LAPS to name the parts of a basic plant. Christian Value: thankfulness	Flower, leaf, petal, seed, stem, root Deciduous, evergreen, branch, branches, bark, trunk, (Ash, horse chestnut, pine, sycamore, holly, hawthorn) Names of locally found wild plants Daisy, buttercup, dandelion etc...
2. What are the parts of a tree? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/tall-trunks give the children time to talk to each other about which is the odd one out. Feedback to the class. Recap parts of a flower. **Learn** What do you know about a tree? https://www.bbc.co.uk/teach/class-clips-video/science-ks1-plants-what-is-a-plant/zp6xnk7 Outdoor learning Go outside into the garden/field 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 off – discuss the bark. What does the bark feel like? Go through the Powerpoint on the different parts of a tree – roots, bark, branches, crown, leaves and trunk.	

Respond Children to collect twigs and leaves from outside to make a tree. Then label the different parts. LAP MAP given labels HAP write labels. **Reflect** Who created the plants and flowers? Children to take a moment to reflect on the beauty of our world (spiritual reflection) Scientific enquiry – Explore the world around them and raise their own simple questions. Type of scientist – I can use scientific enquiry. FROGS = grouping and classifying LO: identify and describe the basic structure of a tree.	
3. We're going on leaf hunt – what will we find? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/types-of-leaves Give children time to discuss with a partner and then feedback which they think is the odd one out – no wrong answer. **Learn** What do you know about trees? 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 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. https://www.twinkl.co.uk/go/resource/tgv2-sc-7-quick-facts-evergreen-and-deciduous-trees-video Identity 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. **Respond** Go on a tree hunt around the school grounds. Take photographs of deciduous and evergreen trees. Upload photographs to seesaw explaining how they know a tree is deciduous/evergreen. Can they name any of the trees. Discuss how we can respect and look after our local environment. **Reflect** In garden take time to reflect on how the beauty of our world. Imagine what our world would look like if all trees were evergreen / deciduous. 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 FROGS = grouping and classifying. LO: To identity deciduous and evergreen trees. Christian Value: respect	
4. What flowers are in our local environment?	

Explore BIT https://explorify.uk/en/activities/the-big-question/why-don-t-all-plants-look-the-same Children to discuss with a partner their thought. Share ideas with the class. **Learn** 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. Work through https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/zjnmqfr What have the children planted? Look at e.g. sunflowers, sweet peas or other fruits and vegetables, tulips, daffodils, pansy, clematis, fuchsia, rose. **Respond** 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. **Reflect** Should we pick flowers from people gardens? 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 FROGS – grouping and classifying LO: To know and name common wild and garden plants, including deciduous and evergreen trees LAP To name common wild and garden plants. 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. What are the parts of the human body? **Explore** BIT https://explorify.uk/en/activities/zoom-in-zoom-out/pink-and-bumpy what do they think it is an image of? Zoom out – have you changed you mind. Repeat until the tongue is visible. Were they correct? How did they know it was a tongue? **Learn** What do we mean by the human body? Ask the children to point to a part of the body, then another. Children to draw around a friend in groups showing the Christian value of friendship. 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. **Respond** 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. Challenge can they add any other labels tom their body? **Reflect** Look at https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/z3cyn9q Acitvity 1 - finding the body parts. Scientific enquiry – I use simple scientific language. FROGS – grouping and classifying LO: To draw and label the basic parts of the human body. Christian Value: friendship	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. What are our senses? **Explore** https://explorify.uk/en/activities/odd-one-out/in-your-eyes children to discuss with a partner and share ideas. No wrong answers. Simon says recap of the body parts. **Learn** 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? How do you know? Why body part are you using / which sense are you using? Play a sound https://explorify.uk/en/activities/listen-what-can-you-hear/beep-beep-toot e.g. traffic, train, horn. 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. Work through https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zsbntrd 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? **Respond** Children to record using words, sentences or pictures what they could see and hear either in books or on Seesaw. **Reflect** 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 – using their observations and ideas to suggest answers to questions Type of scientist – I talk about what I have found out. FROGS – grouping and classifying LO: To know that our ears are used for hearing and eyes for seeing. Christian Value: respect and compassion	
3. What can we taste, touch and smell? **Explore** https://explorify.uk/en/activities/what-if/everything-tasted-the-same children to discuss with a partner and share ideas. What are the five senses? Which two have we looked at so far? **Learn** https://www.bbc.co.uk/iplayer/episode/m000tssc/hey-duggee-series-3-35-the-senses-badge 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? **Respond** Children to explore these senses by taking part in a carousel of activities. Feeling boxes for touch, covered cups with a hole in for smelling different items. Circle time taste testing. In touch boxes have a pineapple, sticks, etc. In smell lemon, vinegar, etc and taste ??? (depends on allergies in the class) **Reflect** What sense do you think is the most important? If you had to lose a sense, which one would you choose to lose? Why?	

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 FROGS research LO: To identify things they can feel, smell and taste using their senses. Christian Value: truthfulness	
4 Can you name everyday animals and where you would find them? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/flappy-friends **Learn** https://explorify.uk/en/activities/listen-what-can-you-hear/old-macdonald what can you hear? Go through Powerpoint on guessing what the animal is using the clues. E.g. I have four legs. I am grey. I have a trunk. What am I? Give the children pictures of a variety of animals. What are they? Make sure the animals that you show them are parrot, penguin, owl, elephant, dog, human, cat snake lizard, frog, fish because these will be needed to be know for lesson 5, so save the pictures for next time. You could add some other animals, e.g. cow, sheep, pig etc depending on cohort. Children to discuss animals with a partner. On board display a picture of a jungle and a selection of animals. Which animals would live in the jungle? Repeat with a farm. **Respond** Ask the children to label the different animals and stick in their books. Where would you find them? Which live on a farm? Jungle? Etc. Add to their labelled drawings. Extension - do you know any other animals that live there e.g. goat on a farm. **Reflect** - https://explorify.uk/en/activities/zoom-in-zoom-out/brown-hair https://explorify.uk/en/activities/listen-what-can-you-hear/part-of-the-family what am I? - farm 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 FROGS grouping and classifying LO: to name common animals and identify where you would find them. LAP To name common animals.	
5 What are the three of the animal groups? Change from last year - now only focus on mammals birds and fish.	

Explore https://explorify.uk/en/activities/odd-one-out/spooky-animals Give and recap the children pictures of a variety of animals. What are they? Make sure the animals that you show them are either birds (parrot, penguin, owl), mammals (elephant, dog, human, cat), or fish. **Learn** In pairs ask the children to sort the above animals. Listen to the vocabulary used to assess where they are. Children to learn name of the different type of animals – mammals, birds, fish. 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, **Respond** Children to sort the pictures into the three groups. Children to take a photo of their sorting and upload to seesaw. HAPs can they add any other animals to the groups. E.g. camel, clownfish, robin. **Reflect** 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 FROGS grouping and classifying LO: to know that animals can be grouped fish, birds and mammals Christian Value: respect	
6 Why is it a bird? A mammal? A fish? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/baby-animals look at these animals. Which are the odd ones out? What do they have in common? What is different? **Learn** What are the five different types of animals – amphibian, mammal, fish, bird and reptile. Children to learn the features that make an animal belong in its group. Give each table a picture of a different mammal – dog, cat, human, elephant and mouse. What features does their animal have? – e.g. fur, 4 legs. Groups to thought shower. Let's compare our mammals. What is the same? Hair/fur what is different number of legs. https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zfm84xs Now let's think about the features of a bird. Do all birds have the same features? Give children two pictures – a parrot and a penguin. Children to annotate the features of each animal. How are they the same? How are they different? https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zkn2jsg HAPs could look at reptiles and amphibians. Repeat activity with fish https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zt2kcmn	

Respond Children to pick two groups of animals, either fish, mammals or birds. In books children to create a thought shower of features. Then write draw and label animal writing a sentence to explain why that animal belongs to that group. Display animals on board to help them with ideas. E.g. Mammal – monkey, dog, human. Fish – clown fish, puffer fish, angelfish. HAPS could look at reptiles and amphibians. E.g. reptile – tortoise, snake, crocodile. Amphibian – frog salamander. **Reflect** Can you think of an animal that belongs in...? group? Go through a selection of animals from last time. What groups are they in? Think about the Christian value of respect in that no two living things are the same. 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 FROGS grouping and classifying LO: to describe the structure of a variety of common animals. Christian Value: respect	
7 What is a herbivore, omnivore and carnivore? **Explore** https://explorify.uk/en/activities/odd-one-out/mystery-markings Recap the five different animal groups. What do all birds have in common? They have wings, feathers, beak, two legs. Mammals? Fur/hair What is different? **Learn** What do all living things needs to do to survive? Identify that we need to eat and drink and this is called an animal's diet. https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zfbntrd 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. Herbivore – eats plants, carnivores meat eaters, omnivores eat plants and meat. What are humans naturally? **Respond** Give the children some common animals (rabbit, elephant cow (herbivore), crocodile, lion, owls (carnivore) dog, pig human (omnivore) and ask them to sort into the three groups take photos and upload to seesaw. Can use books/IPads to find the answers if unsure.– persevere **Reflect** What would happen if all animals all ate meat?	

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 FROGS grouping and classifying LO: To group animals into carnivores, herbivores and omnivores. LAPS to group animals into herbivores and carnivores. Christian Value: Perseverance	
How can we classify animals? **Explore** https://explorify.uk/en/activities/odd-one-out/smile-please Think about habitats, what do they ear, what animal group do they belong to. Vocab recap – herbivore, carnivore, omnivore, mammal, bird and fish. **Learn** display on the board some prompts for thinking. Discuss. Who is right. E.g. Penguins are birds because they have feathers, two legs and a beak. Penguins are not birds because they can't fly. Carnivores eat meat, not animals. Meat comes from shops. Carnivores eat other animals. Look at a selection of anaimls and discuss. What groups are they from? What do they eat How are they the same/different? Model to the children / sort together the aniamls into mammals, not mammals. Then repeat carnivore/not carnivore. With a partner have a go at sorting them in different ways. E.g. lives in water. Lives on land, lays eggs. **Respond** children to choose how to sort their animals. E.g. could sort mammal, not mammal. Carnivore, not carnivore. Bird not bird. HAPS MAPS to choose how they sort their anuimal and fill in heading. LAP to be given headings. HAPS how do you know they belong in that group. E.g. bird because it has wings, mammal because it is warm blooded and gives birth to live young. **Reflect** what if there were no e.g. mammals/birds/fish 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 FROGS grouping and classifying. LO: describe and compare the structure of a variety of common animals	
Feedback:	

Year 1 Everyday Materials Chemistry	
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? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/brushing-up Highlight the different materials on the paintbrushes -1 wood, 2 metal 3 plastic. **Learn** 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? Place one of these raw materials in a feely bag. Describe to the class it's properties. E.g. it is hard, smooth, stiff – what could it be? Wood. Repeat with other materials using the words from the key vocabulary box. Children to learn that these words are the properties of the materials. **Respond** Children to name the raw materials by labelling. Challenge – can they name a property of the material. **Reflect** What if there was no plastic? – would this be a good thing? Why/why not. Christian value of respect- respecting the materials so they aren't damaged. (Especially the glass.) 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. Type of scientist – I observe closely. FROGS – grouping and classifying	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

LO: identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. HAP To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock and their properties. Christian Value: respect	
2. What is it made from? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/fascinating-forks **Learn** On tables provide the children with a variety of objects made from – wood, plastic, glass, metal, brick, card, cardboard, clay, fabric, rubber, wool, and elastic. These objects to include e.g. a piece of wood, a beater, (HAP paper) plastic plate/cup/cutlery, ruler, packaging from a food box, lego, glass bottle, glass, metal cutlery, brick, A4 card, cereal box/packaging, plate, cup, jumper, cloth, rubber, elastic band. Ask the children to sort the objects. Bring the class together. 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 continuing learning the vocabulary wood, plastic, glass, metal and extend by adding brick, card, cardboard, clay, fabric, rubber, wool, and elastic. 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? What about around school? **Respond** (Outdoor learning) – Children to go on a material hunt around the school. In pairs children to pick a material they have to focus on. On the hunt they need to take as many photos as they can of this material. E.g. metal – table legs, chair legs, bike shed, bikes, scooters. If time ask them to choose another material and repeat. **Reflect** Are objects made of just one material? What about a door? – it is made of wood and has a metal handle. 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 classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language. Type of scientist – I can compare things and I can sort and group them. FROGS – grouping and classifying LO: To distinguish between an object and the material from which it is made Christian Value: friendship	
3. Can you describe the materials?	

Explore BIT https://explorify.uk/en/activities/odd-one-out/unusual-houses Use a feely bag containing the materials from the first lesson. What properties did you think of to describe materials in the first lesson? (flexible, hard, soft, transparent) **Learn** Today children to focus on bendy, dull, shiny, hard, rough, smooth, soft, stiff, stretchy, strong, and twist. (HAP add liquid, magnetic, solid) Which words do they know? Which don't they know? Show the children some materials. 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? stiff? **Respond** Using feely bags (gift bags for feely bags) children to describe a material using the property vocabulary. can their partner work out which material they are describing? Have differentiated feely bags. Objects to include ruler, elastic band, mirror, wood, cloth, lego. LAP to focus on bendy, stiff, rough, smooth, hard, soft, so have ruler, bubble wrap, sand paper, wood. Teacher to take photos of children exploring feely bags. Could record what the children are saying. **Reflect** I am bendy. I can be twisted. I am stretchy. I am soft. What am I? 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 classifying) With help, they should record and communicate their findings in a range of ways and begin to use scientific language. FROGS – grouping and classifying LO: To describe the simple physical properties of a variety of everyday materials Christian Value: Perseverance, thankfulness, truthfulness, compassion, respect, friendship	
4. What are the properties of these materials? **Explore** BIT https://explorify.uk/en/activities/what-if/every-material-was-stretchy **Learn** Provide the children with a selection of materials that are transparent and opaque – sunglasses, acetate sheet, glass, paper, wood, cloth. Ask the children to sort them. How have they done it? Children to learn opaque and transparent. Model to the children how to complete a table by doing one on the board, identifying if the material is opaque or transparent. What do the words absorbent and waterproof mean? Show the children a different set of objects. E.g. rubber gloves, wellies, cardboard box, towel. Which do they think will be absorbent? Which do they think will be waterproof? Model to the children how to conduct the experiment by using a syringe to put 10ml water on the material over a tray. Is there water in the tray? Why not? Where has it gone? The	

cloth has absorbed the water. Repeat with a poly pocket. Where has the water gone. In the tray - why? It is waterproof. **Respond** Children to conduct the same experiment with there materials. Give them a table to record there results on following the format of the transparency/opaque table. What did you find out? HAP **Reflect** Someone has spilled a drink on the floor. Which material would be a good one to use to clean it up? 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 FROGS observation over time. LO: To explore transparent, opaque, waterproof and absorbent materials. Christian Value: friendship	
5. What material will keep my drink the warmest? - two lessons **Explore** https://explorify.uk/en/activities/odd-one-out/delicious-drinks 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. **Learn** Children to learn who the scientist Chester greenwood was and what he invented - earmuffs. Identify that we should be thankful for his invention. Tell the children that when it is cold, you also like a nice warm cup of hot chocolate to warm you up. Have a cup of hot chocolate in the classroom. Go to drink it - yuck it as gone cold. Pose the question what material will keep by drink the warmest. 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 us tinfoil, bubble wrap, towel, kitchen roll, paper, cling film fabric etc. **Respond** 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 keep by drink warm because it kept the water the warmest. **Reflect** - What other examples can you think of that keep things warm? Hot water bottle, ear muffs, gloves. Why are these good for keeping things warm? What material are they made from?	

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 FROGS observation over time. LO: identify which material will keep a drink the warmest. Christian Value: thankfulness	
6 What material would make the best umbrella for Ted? Two lessons **Explore** BIT What if an umbrella was made of glass? **Learn** 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. Allow the children to choose from the materials box – acetate, fur, felt, bubble wrap, foil, tissue paper, sugar paper, card, fabric, wood, glass, cotton wool. **Respond** Children to write a prediction. I predict that .... Will make a good umbrella because ... is waterproof. **Reflect** Tell your partner three things you have learnt today. Session 2 **Explore** https://explorify.uk/en/activities/zoom-in-zoom-out/fuzzy-friend https://explorify.uk/en/activities/zoom-in-zoom-out/the-space-in-between **Learn** Explain to the children how you are going to do it and teacher draw the method and label on the whiteboard – put Ted inside a beaker. Put material over top of beaker using an elastic band. Drop water onto the material using a pipette. **Respond** Children to conduct experiment. 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. HAP what material should you make the handle out of and why? **Reflect** silly or sensible – wood pans vs metal pans, glass window vs rock window, cotton t-shirt vs metal t-shirt. 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	

FROGS observation over time. LO: To investigate which material would be best to make an umbrella. Christian Value: compassion	
7 Who invented Lego? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/fit-for-purpose **Learn** Give each table different building equipment – one Lego, one wooden blocks, knex, polygon, clay bricks. Ask the children to create a tower. Which tower is the best? Why? Identify that Lego makes a strong tower because the blocks lock together. Let's focus on 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? **Respond** 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? Children to thought shower there thoughts. **Reflect** Why does Lego need to be lightweight? Why is it useful for Lego to be hardwearing? What couldn't Lego be made from? 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 FROGS research LO: To describe the simple physical properties of a variety of everyday materials. Christian Value: thankfulness	
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	Key Vocabulary
1. What is Autumn? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/autumn-leaves Recap from geography - what are the months of the year? What are the four seasons? Join in with Jack Hartmann https://www.youtube.com/watch?v=omkuE6Wa5kQ **Learn** Children to learn 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 environment around us during autumn? Conkers, harvest, leaves falling from trees, scrumping. **Respond** Outdoor learning - 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. **Reflect** - what weather could we add to the background of our tree on our season wheel? What weather is associated with Autumn? 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. Children to add clothing to the person on the season wheel to highlight the impact of autumnal weather. Scientific enquiry - Explore the world around them and raise their own simple questions. With help, observe changes over time. FROGS observation over time LO: To observe changes across Autumn. Christian Value: thankfulness	Autumn, day, month, temperature, weather, time Dark, hail, sleet, snow, winter, night, wind Months or the year, times, day length, dawn, sunrise and sunset, day and night Spring, rainfall, dawn and dusk, sunrise, sunset
2. What is winter? **Explore** BIT https://explorify.uk/en/activities/what-if/winter-never-ended **Learn** 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 (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. 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. **Respond** 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? **Reflect** Watch https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-winter-weather-behaviour-british-animals-plants/zbcg92p Story time https://www.youtube.com/watch?v=2pttp-V24bo But the Bear Snores On Scientific enquiry – Explore the world around them and raise their own simple questions. With help, observe changes over time. FROGS observation over time LO: observe changes across the Winter seasons. Christian Value: thankfulness	
3. What is spring? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/three-seasons Show children pictures of autumn. How do we know it is autumn? Repeat with winter. **Learn** Children to learn how spring differs from autumn and winter. Recap what months are in spring. https://www.youtube.com/watch?v=tWgoYgaxQ0E Watch https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-seasonal-changes-behaviour-animals-growth-cycle-plants/zflynrk7 **Respond** 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? **Reflect** 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.	

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

FROGS observation over time

LO: observe changes across the Spring seasons

Christian Value: thankfulness

4 What is summer?

Explore BIT https://explorify.uk/en/activities/the-big-question/what-if-there-was-only-one-season What are the other seasons. What do we wear in autumn? Spring? Winter?

Learn 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/zkdkjhv https://www.youtube.com/watch?v=1isj2kTZIFs How has our environment changed as we've moved into summer? What has happened to the weather? Temperature? What clothing are we now wearing?

Respond Go on a summer walk and look at their tree. 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.

Reflect

What changes have occurred as we have gone through the seasons? E.g. in spring we get lambs. In autumn the leaves fall off the trees. Assess the children's understanding of the seasons. Reflect on the beauty of our world.

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

FROGS observation over time

LO: To observe changes across Summer

Christian Value: thankfulness

5 Can I create a weather forecast

Explore BIT https://explorify.uk/en/activities/odd-one-out/three-seasons

Learn

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 wake 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 answer questions on what it shows. For example, which season has the longest days? Which has the shortest day? Which season do you prefer? Why? Watch a short weather forecast. What information are we told? Temperature, weather. Could we make our own weather forecasts including the season, temperature (warm, cold or hot) and advice for clothing?

Respond In threes, children to record there own weather forecast using there knowledge from the seasons and upload to seesaw. E.g. Today it is spring and the weather will be warm but raining, so make sure you take an umbrella and a coat. Today it is summer. It will be hot so make sure you wear suncream. Today it is winter, It will be cold. You will need a hat and gloves. (MAPHAP If the forecast was in spring, could they say how many hours of daylight there would be?)

Reflect Listen to some forecasts. What month could they be talking about? How do you know? 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

FROGS observation over time

- LO: To describe weather associated with the seasons and how day length varies

Christian Value: thankfulness

How can we stay safe in summer?

Explore

Learn What can you tell me about the weather in the summer? We are going to learn about how to keep safe in the sun. What do you need to do? Take children's ideas. Go through the sun being dangerous and that we need to follow a special sun safety code to keep safe. Spend time in the shade between 11am and 3pm. Make sure you never burn. Aim to cover up with a hat, t-shirt and sunglasses. Remember children need to take extra care. Then use sunscreen of a minimum SPF30. **Respond** Create a sun safety leaflet / poster. **Reflect** Show pictures of children in the sun. Are they being safe – true or false. LO: observe and describe weather associated with the summer season	
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	**Key Vocabulary**
1. What are the seven life processes?	

Explore BIT on the board display a sunflower, tree, human and frog. Name two similarities and two differences. **Learn** What do all four have in common? – they are all alive. How do we know that they are alive? For something to be alive it has to do certain things. Animals including humans and plants all do these things to be alive. Watch https://www.bbc.co.uk/bitesize/clips/ztbw2p3 For something to be alive it has to do seven things. These things are called life processes. We can use the mnemonic MRS GREN to help us remember – Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition. Go through what each of these scientifically mean. Movement – all living things move. Animals move around to get from place to place. Plants grow and turn towards the light. Respiration – all living things respire. All living things release energy from their food by respiration. Most organisms need oxygen to do this. Sensitivity – all living things are sensitive. Every living thing can detect changes in their surroundings. Growth – all living things grow. Animals grow from babies to adults. Seeds grow into plants. Reproduce – all living things reproduce. Animals have young. Plants produce seeds from which more plants grow. Excretion – all living things excrete. Waste products are removed from the body. Both plants and animals have to get rid of excess gas and water. Nutrition – All living things need nutrition. Animals eat food in order to get nutrients whereas plants produce their own food by turning sunlight into energy. This is called photosynthesis. **Respond** 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. **Reflect** Using picture quiz – which characteristic of MRS GREN is shown here. E.g. dog eating, flower in sun = nutrition Scientific enquiry – To ask simple questions and recognising that they can be answered in different ways. FROGS research Type of scientist – I talk about what I have found out. LO: To identify the seven life processes. Christian Value: respect, thankfulness	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
2 Is it alive, dead or has it never been alive? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/the-circle-of-life On the board show the mnemonic MRS GREN with the what the letters stand for. Ask the children to quickly draw on their whiteboards a picture to represent each letter. How do we know something is alive? Recap	

https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zs73r82 and 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 **Learn** What do we mean by something that is dead? It is something that used to do all seven life processes, but is now not 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? It is something/an object that has never done any of the life processes. Can they think of some examples? Outdoor learning – Children in pairs take an iPad outside. Using seesaw ask them on one page could they take photographs of things that are alive. What have you taken a photograph of? How did you know it was alive? Now on a new page on seesaw, take photographs of things that are dead. What did you find? On a new page take photographs of things that have never been alive. **Reflect** In the classroom, choose one picture from each page. How did you know it was alive / dead or never been alive? Annotate/voice recording on seesaw (Christian value of friendship, working together) Scientific enquiry – To identify and classify. FROGS grouping and classifying. Type of scientist – I can compare things and I sort and group them. LO: To explore and compare the differences between things that are living, dead, and things that have never been alive Christian Value: thankfulness, friendship	
3. What am I? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/savanna-sidekicks What group of animals do they belong to? – mammal **Learn** Play what am I? Give the children clues. Can they guess what the animal is. Make sure the animal group they belong in is one of the clues. E.g. I am a reptile. I have no legs. I have a long tongue. I slither and hiss. 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. badger, fox, porcupine, puffin, whale. **Respond** 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. what animal group do they belong to? where they live, food they eat. **Reflect** Children to use an animal they have researched to play what am I with either the class or partner. Scientific enquiry - To gather and record data to help in answering questions FROGS research. Type of scientist - I gather and record simple data in different ways LO: To name different animals Christian Value: thankfulness	
4. What habitats are in our local environment and what lives there? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/muddy-buds What do we need to survive? - recap seven life processes. **Learn** We also need a home. Children to learn that a habitat is the home of a living thing. What different habitats can you think of? 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? **Respond** Outdoor learning - What animals live in our local environment and what are their habitats? Give the children an iPad and explore the school grounds (not just the school garden) Record photographs of animals and what their microhabitat is and upload to Seesaw. **Reflect** Would you see a cactus/camel on the school field? Why not? What animals/plants would you see? Scientific enquiry - To use their observations and ideas to suggest answers to questions. FROGS grouping and classifying. Type of scientist - I observe closely. 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? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/different-homes What is a habitat – a place that a living organism lives. What microhabitats are in our local environment? **Learn** 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/zxdsvcw) 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/ztf4kqt pond habitat. **Respond** 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. **Reflect** How can we protect these animals – Christian value of respect and compassion. Scientific enquiry – To ask simple questions and recognising that they can be answered in different ways. FROGS research Type of scientist – I recognise that questions can be answered in different ways, LO: To 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 Christian Value: compassion, respect	
6 What animals are herbivores, omnivores and carnivores?	

Explore https://explorify.uk/en/activities/odd-one-out/smile-please If the children don't mention it – why do you think their teeth look different? Not all animals have the same teeth. It depends on their diet as to what teeth they have. **Learn** 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 form 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. **Respond** 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. **Reflect** 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 – To identify and classify. FROGS grouping and classifying Type of scientist – I can compare things and I sort and group them. LO: To identify herbivores, carnivores and omnivores. Christian Value: respect	
7 What is a food chain? **Explore** https://explorify.uk/en/activities/odd-one-out/tasty-web Children to recap seven life processes and what herbivores, omnivores and carnivores are. **Learn** 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 ae not able 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 foods 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 animals gets its food. Food chains are one of the ways living things depend on ach 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? **Respond** Give the children a set of animals and ask them to use them to create food chains. **Reflect** Display a food chain containing plankton, fish and shark. What would happen if the fish became extinct? Or the plankton? Or the shark? Consolidation video https://www.bbc.co.uk/teach/class-clips-video/science-ks1-the-food-chain/zbr8d6f Scientific enquiry – To ask simple questions and recognising that they can be answered in different ways. FROGS seeking patterns. Type of scientist – I use simple scientific language. LO: To create a simple food chain. 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	**Key Vocabulary**
1. What is a bulb? (Must be taught in September) **Explore** https://explorify.uk/en/activities/odd-one-out/seeds-of-life **Learn** On each table put a daffodil bulb. Ask them to discuss what they think it is. What do they think it will grow into? It is a bulb. Not all plants start as seeds. Read That's not a daffodil by Elizabeth Honey (I will ask school to buy the book)	Habitat, microhabitat, grass, pond, woodland, under log, under bushes,

Respond Children to plant the daffodil bulbs into a big pot and put outside. It will be the children's responsibility to look after their daffodils. **Reflect** What do we think is going to happen to our bulbs? When do you think they will bloom? Scientific enquiry - To use their observations and ideas to suggest answers to questions .FROGS observation over time Type of scientist - I observe closely. LO: To observe how bulbs grow into mature plants. Christian Value: thankfulness, respect	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
2. What plants are in our local environment? **Explore** https://explorify.uk/en/activities/odd-one-out/mellow-yellow **Learn** 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. Outdoor learning - What plants and trees are in out local environment? **Respond** 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. **Reflect** What if there were no plants? Children to reflect on the beauty of our world. 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 - To use their observations and ideas to suggest answers to questions. FROGS grouping and classifying Type of scientist - I observe closely. LO: To observe and describe mature plants. Christian Value: thankfulness, respect,	
3. What do plants need to grow and stay healthy? **Explore** BIT https://explorify.uk/en/activities/what-if/plants-could-move-from-one-place-to-another	

Learn How do we know if a plant is healthy? What do plants need to stay healthy and grow? 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 and stay healthy plants need water, sun and the correct temperature. Show the children some plants (small bedding plants e.g. pansies, violas, lobelias) We are going to investigate where they grow best to stay healthy. Tell the children that different experiments will be set up and plants will be put in different places or given different things- water and no light, light but no water, no water or light and water and light. Based on the video the children may also want to check the temperature so one can be put in the science fridge, or they may want to plant one in sand instead of soil. There is sand in the science cupboard. Highlight that to keep it a fair test, only one thing can be changed. For example if the plant has no sun, it must still have water as it is the light that is changing. **Respond** Children to predict which plant will grow and be the healthiest. Set up experiment. Children to look after plants according to the experiment and monitor what happens over the next couple of weeks. **Reflect** Children to share predictions with their buddy. Verbally which of the plants do you think will not grow? Do you think any of the plants will die? Christian value of perseverance as children will have to be patient to wait for plants to grow. Scientific enquiry - To perform simple tests. FROGS fair testing Type of scientist - I perform simple tests. LO: To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy Christian Value: Perseverance	
4. What do plants need to grow and stay healthy? **Explore** BIT https://explorify.uk/en/activities/zoom-in-zoom-out/healthy-skin Zoom in zoom out. Would you like to eat this? Why? How do we know this orange is healthy? **Learn** 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 plants? Which have grown? Which look healthy? How tall are the plants? Rank the plants in order from healthiest to unhealthiest. So what do plants need to grow well and stay healthy? - water, light and the right temperature.	

Respond Children to write a conclusion on what they have found out. For example I found out that a plant needs light, water and the right temper4ature to grow well. I know this because the plant that had..... grew the most / looks the healthiest. **Reflect** Do you think we could rescue the plants that are unhealthy/dying? What could we do to help our unhealthy plants grow? Where should we put them? Scientific enquiry – To use their observations and ideas to suggest answers to questions. FROGS observation over time Type of scientist – I talk about what I have found out. LO: find out and describe how plants need water, light and a suitable temperature to grow and stay healthy Christian Value: Perseverance	
5 Can I grow the tallest sunflower? (Mid April to end of May) **Explore** BIT zoom in zoom out https://explorify.uk/en/activities/zoom-in-zoom-out/brown-and-sticky **Learn** Do all seeds look like the one in the clip? Show the children a variety of seeds. Which do they think will grow into big plants? Why? Watch https://explorify.uk/en/activities/whats-going-on/shooting-sprouts/classroom. What is happening? Tell the children that they are going to have a competition of who can grow the tallest sunflower. What are they going to need? What are they going to have to do? Go through how to plant a seed. **Respond** All children to plant their own sunflower seeds, making sure their pot has their name on it. **Reflect** What do sunflowers need? So where should we place our pots so that they can grow? How can we look after them to make sure they grow well? Children to reflect on how they can grow the tallest sunflower. Children to look after their plants in the coming weeks. Scientific enquiry – To ask simple questions and recognising that they can be answered in different ways. FROGS observation over time Type of scientist – I recognise that questions can be answered in different ways. LO: To describe main changes as seeds and bulbs grow into mature plants	
6 How has our garden grown? **Explore** BIT display a sunflower, daffodil, evergreen and deciduous tree. Name two similarities and two difference.	

Learn Look back at the pictures taken in lesson 1. Do you think these plants/trees will still be there? Why? Why not? They may have died as they are seasonal. They may have grown. Outdoor learning -. Go to the school grounds. How have the plants grown/changed? **Respond** Take photographs and annotate on Seesaw the changes. Add a page onto Seesaw to explain what happened to their daffodils and what happened to their sunflowers. **Reflect** How could we use plants to improve the school grounds? Where would you plant? What types of plants would you like? Bushes? Trees? Flowers? Herbs? Scientific enquiry - With help, observe changes over time. Use their observations and ideas to suggest answers to questions FROGS observation over time 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? **Explore** https://explorify.uk/en/activities/odd-one-out/in-your-eyes What are the seven life processes? Link to living things and their habitats. **Learn** Display some different animals, including humans. 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. Go through why animals need each of these. E.g. Humans and animals need air to survive. Oxygen is our most basic need. We need water to survive. We cannot	Survival, health, breathing, air, water, food Balanced diet, bread, rice, potato, pasta, dairy, fats, sugars, fruits and vegetables, meat,

survive without it. Food gives bodies the energy to stay healthy and to be able to work properly. Shelters act as protection from predators. Shelter helps keep your body at constant temperature and gives a place of rest. We need to be thankful that we have all these things. What would happen if animals didn't have these things? **Respond** Children to create a poster on what animals need to survive. **Reflect** display a picture of sweets, school, TV, healthy food, clean water and clean air. Ask the children to order which are the most important to the least of what people need. Children to explain why they think this. What else do you think is important for people to stay healthy and why? Scientific enquiry - Type of scientist - I recognise that questions can be answered in different ways. FROGS research To ask simple questions and recognising that they can be answered in different ways. LO: To find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Christian Value: thankfulness	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....
2. What are the five food groups? **Explore** https://explorify.uk/en/activities/odd-one-out/fuel-up What do animals including humans need to survive - food, shelter, water, air. **Learn** Today we are focusing on food. 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. Show the children a variety of fruits and vegetables, e.g. leeks, broccoli, peppers, melon etc. Do the children know what they are? Identify that these belong to the fruits and vegetables group. Explore the protein group. What animal does beef/steak come from? Pork? Its not just meat that contains protein - lentils, eggs. Go through foods that belong in other food groups. **Respond** Children to sort their pictures of the foods they started with into the five different food groups and take a photograph for seesaw. **Reflect** Show the children the Eatwell plate. Why is the plate split into different sections? Why are they not all the same size? Discuss that to be healthy we don't need to eat the same amount of each food group. Ask the children to reflect on their lunch. Was it balanced? Which food groups did they eat? Scientific enquiry - To identify and classify. FROGS grouping and classifying.	

Type of scientist - I can compare things and I sort and group them. LO: To describe the importance for humans eating the right amounts of different types of food. Christian Value: compassion, respect	
3 How does exercise affect our heart rate? - lesson 1 **(2 lessons)** **Explore** https://explorify.uk/en/activities/what-if/we-couldnt-exercise **Learn** What is exercise? Exercise is anything that makes our bodies move. 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 learn how to check their heart beat - in wrist or neck. How ae you going to do the experiment? Record heart rate after 2 mins of walking, 2 mins of running and then 2 mins of resting. What do you think will happen to your heart rate after walking for two minutes? Will it be faster/slower/same after running for two minutes? What about after resting? When will your heart rate be the fastest? Slowest? **Respond** Children to write the prediction for the experiment including the word because. **Reflect** - Children t o share their predictions with a friend. What is your favourite form of exercise? Why? Scientific enquiry - To ask simple questions and recognising that they can be answered in different ways. FROGS seeking patterns Type of scientist - I ask simple questions. LO: describe the importance for humans of exercise. Christian Value: Perseverance, truthfulness,	

4 How does exercise affect our heart rate? - lesson 2 (2 lessons) **Explore** https://explorify.uk/en/activities/the-big-question/what-sport-makes-you-sweat-the-most **Learn** What experiment are you conducting? how does exercise affect our heart rate? Who can remember how you are going to do it? Record heart rate after 2 mins of walking, 2 mins of running and then 2 mins of resting. What do you predict will happen? Lets see if you're right. **Respond** Children to conduct experiment and record results in a given table. **Learn** what did you find out? Did exercise affect your heart rate? **Respond** Children to write a conclusion 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... **Reflect** Does exercise help us in school? Watch operation ouch - exercise and brain power to highlight the importance of exercise. https://www.youtube.com/watch?v=XzBtIlOHPyQ Children to persevere and not give up when exercising. They also need to be truthful when recording their heartbeats. Scientific enquiry - To perform simple tests FROGS seeking patterns Type of scientist - I perform simple tests LO: describe the importance for humans of exercise. Christian Value: Perseverance, truthfulness,	
5 How can germs be spread? **Explore** BIT what if door handles were made of chocolate? **Learn** 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.	

Respond Children to create a poster fact sheet about the importance of personal hygiene. **Reflect** Children to share their posters. Any good ones could be laminated and put up near the sinks to remind the children of why it is important to wash hands. Scientific enquiry – To use their observations and ideas to suggest answers to questions. FROGS research Type of scientist – I talk about what I have found out. LO: describe the importance for humans of hygiene. Christian Value: thankfulness, friendship	
6 Can you match an animal to its offspring? **Explore** https://explorify.uk/en/activities/odd-one-out/looking-after-baby **Learn** 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. Christian value of thankfulness – thankful for the world we live in. **Respond** Children to match the parents to the offspring and can the names of the young to the pictures. **Reflect** Do you have a way of remembering the name of young animals? Why do you think some offspring have the same name? Scientific enquiry – To identify and classify. FROGS grouping and classifying Type of scientist – I can compare things and I sort and group them. LO: notice that animals, including humans, have offspring which grow into adults Christian Value: thankfulness	
7 What is a lifecycle? **Explore** https://explorify.uk/en/activities/odd-one-out/baby-animals	

Learn 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? **Respond** 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 **Reflect** How does the lifecycle of a human differ to that of a butterfly? What other animal goes through a metamorphic change – frog. What can we do to take care o f the animals in our world? Christian value of thankfulness – thankful for the world we live in. Scientific enquiry – To use their observations and ideas to suggest answers to questions. FROGS grouping and classifying Type of scientist – I use simple 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? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/fascinating-forks **Learn** 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/topics/zsrfvwx/articles/zd9w8hv the identifying materials around you video. 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. **Respond** Outdoor learning - Children to go on a material hunt to find objects made from these different materials. Focus them by asking them to take photos on an iPad using Seesaw, of metal objects they can find. Aks them to start a new page on Seesaw and ask the to take photograph of everything they can find made of wood. Repeat with plastic, glass, brick/rock, paper/cardboard. **Reflect** What materials did they find the most of? Least? Which were man-made and which were natural. have they found out? Identify that we need to be thankful for these materials as without them life would be a lot harder. Scientific enquiry - To identify and classify. FROGS grouping and classifying. Type of scientist - I can compare things and I sort and group them. LO: identify a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. Christian Value: thankfulness	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,
2. Which material would be suitable? **Explore** BIT what if plastic had never been invented? **Learn** Provide the children with feely bags (could use gift bags if no 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. **Respond** Outdoor learning – children to take an iPad to take photographs to upload to Seesaw. Go outside and look at the school. What material is it made from? Is it just made from one material? Why is it made from different materials? Why are the windows made of glass? Ask the children to take photographs of the different materials the school is made from. Look at other buildings on the estate / sheds / bike shed. What are they made of? Are there any differences between them and the school? **Reflect** https://www.bbc.co.uk/bitesize/topics/zsrfvwx/articles/zd9w8hv Cinderella's shoes. What did the Fairy Godmother do wrong? The Fairy Godmother wanted the lightest material to make Cinderella's shoes but she chose **glass** which weighed the heaviest. The lightest material in the experiment was the wood. What do you think wooden shoes would be like to wear? What material would you choose to make a pair of shoes from? Why? Scientific enquiry – To use their observations and ideas to suggest answers to questions. FROGS grouping and classifying Type of scientist – I use simple scientific language. LO: Compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Christian Value: thankfulness	
3. Which material is the most absorbent? – lesson 1 **(This will take two lessons)** **Explore** BIT https://explorify.uk/en/activities/odd-one-out/fit-for-purpose **Learn** Watch using the right material video https://www.bbc.co.uk/bitesize/topics/zrssgk7/articles/z6jm7yc 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. Recap the word absorbent from year 1. 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? 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. **Respond** In books children to write the question, equipment, method and prediction. **Reflect** Children to share prediction with their peers. Scientific enquiry – To ask simple questions and recognising that they can be answered in different ways. FROGS observation over time Type of scientist – I ask simple questions. LO: identify and compare the suitability of a variety of everyday materials Christian Value: respect, friendship	
4 Which material is the most absorbent? – lesson 2 **Explore** https://explorify.uk/en/activities/odd-one-out/functional-footwear **Learn** Recap experiment from last time. What are question are we answering? **Respond** Children to conduct their experiment and record their results in a table. What have you found out? Children to add conclusion in their books. Which material was the most absorbent? Which was the least absorbent? Was your prediction correct? **Reflect** So what should we tell the midday super4visors they need in the hall in case someone makes a spillage at lunchtime? Christian value of friendship and respect as children to conduct experiment in pairs/threes. Scientific enquiry – To observe closely, using simple equipment FROGS observation over time Type of scientist – I use simple equipment to make measurements. LO: identify and compare the suitability of a variety of everyday materials Christian Value: respect, friendship	
5 Can you make an object change shape? **Explore** 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. **Learn** Provide the children with a variety of objects made of different materials. Ask the children to sort them. How have you sorted them? Now 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.	

Watch different materials changing shape https://www.bbc.co.uk/bitesize/topics/zsrfvwx/articles/z62txbk **Respond** 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 Reflect https://explorify.uk/en/activities/what-if/every-material-was-stretchy Scientific enquiry – To gather and record data to help in answering questions. FROGS research Type of scientist – I gather and record simple data in different ways. 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	
6 Why is recycling important? **Explore** https://explorify.uk/en/activities/what-if/your-school-banned-paper **Learn** 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 carboard and brown bin garden waste. Show the children the recycling symbol. What are the benefits of recycling – it helps us respect our plant by reducing the rubbish littering our world, protects animals and their homes by making sure less rubbish ends up in lacs like forests and seas. Watch https://www.bbc.co.uk/teach/school-radio/assemblies-ks1-ks2-where-does-all-our-rubbish-go-understanding-waste/z8hrydm Go through how the different materials are recycled. https://www.youtube.com/watch?v=SSIVXZrWMK4 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. **Respond** Show the children a variety of objects. Ask them to sort them into the correct bins. **Reflect** Why is it important to recycle? Scientific enquiry – To identify and classify. FROGS grouping and classifying Type of scientist – I can compare things and I sort and group them. 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. What are the functions of the parts of a plant? https://explorify.uk/en/activities/what-if/plants-could-talk 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 – thankfulness. 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. Scientific enquiry – To gather, recording, classifying and presenting data in a variety of ways to help in answering questions FROGS grouping and classifying Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables.	Absorb, air, fertiliser, fertilisation, flowering, fruit, function, germination, insect pollination, life cycle, minerals, non-flowering, nutrients, pollen, pollination, reproduction, seed dispersal, seed

LO: To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Christian Value: thankfulness	formation, soil, transportation, wind pollination
2. How is water transported in plants? https://explorify.uk/en/activities/what-if/we-did-not-plant-trees Show the children a cup with blue food colouring in, another will yellow and an empty cup. (Or two primary colours) Pose the question C**an 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-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhv 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 – To use straightforward scientific evidence to answer questions or to support their findings. FROGS observation over time Type of scientist – I make 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? https://explorify.uk/en/activities/odd-one-out/what-is-inside-flowers 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 – To gather, recording, classifying and presenting data in a variety of ways to help in answering questions. FROGS grouping and classifying Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. 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? **Explore** https://explorify.uk/en/activities/odd-one-out/three-weeds Today's question – How do parts of the plant help pollination and fertilisation? What are the male and female parts of the plant. Refer back to last week. https://www.dkfindout.com/uk/animals-and-nature/plants/parts-flower/ The carpel is made up of three parts – stigma, style and ovary. These are the female parts of the plant. What about the male parts. Show on the board. **Learn** What is the job of a flowering plant – To create seeds so new plants can be grown. Go through PowerPoint. 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 **Respond** In partners (mixed ability) give the children pollination statements for them to order. Take a photograph – teacher to post (not activity) **Reflect** Go through the answers together. **Learn** Work through https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zrrk4xs Focus on the relevant areas, depending on the children's understanding of the lesson so far. You may just need to do the quiz.	

Respond In books children to draw and explain the processes of pollination and fertilisation separately. **Reflect** Look at knowledge organiser and highlight what we have learnt, Scientific enquiry – To gather, recording, classifying and presenting data in a variety of ways to help in answering questions. FROGS grouping and classifying. Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To explore how plants are pollinated and fertilised. Christian Value: Perseverance	
5. What is the Life cycle of a plant? **Explore** https://explorify.uk/en/activities/odd-one-out/sightseeing-seeds The images are dandelion, coconut and sycamore seeds Recap quickly the parts of the plant and the pollination process. **Learn** What do we mean by a life cycle? Can you think of any examples? Tell the children that pollination is one part of the life cycle of a flower. Does anyone know any of the others? Go over PowerPoint to learn the 5 stages (they should already know 3!) https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zrrk4xs?scrlybrkr=fb40169a look at this website (same as last week) to focus upon the seed dispersal video if didn't do it last week. **Respond** Children to create a life cycle of a flower in their books. Children can visit science help desk – have on their widget cards and photos of life cycle.. HAPs to write/ draw what happens at each stage, LAPs to just write the headings. SEN to stick the pictures in order. **Reflect** Go through the answers together. Look at knowledge organiser and highlight what we have learnt, Scientific enquiry – To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables FROGS grouping and classifying Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. 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? **ExPlore** https://explorify.uk/en/activities/odd-one-out/friends-of-flowers The BIG QUESTION: How do you know the person next to you is alive? Recap the seven life processes. 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? What do plants need to grow well (this have done this in year 2 so this shouldn't be new to them?) Watch to recap https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-do-plants-need-to-survive/zkw2gwx

Learn- Today we are going to set up an investigation into finding out DO ALL PLANTS NEED THE SAME AMOUNT OF SUN AND WATER? Show the children some plants. Are they the same? No there will be a cactus and another plant (whatever I have bought) What could we do to answer this question? DO ALL PLANTS NEED THE SAME AMMOUNT OF SUN AND WATER?

We will need to have one cactus and one flower in each of these conditions

Control :sun and water,

1: no sun and water

2: sun and no water

Talk about what a control is and why we will need it – to make sure we have something to compare it to, to see how the others will differ. We will be doing this as a whole class.

Respond – In their books draw/write the method. E.g. the control plants with sun and water , cactus and flower with sun and no water and cactus and flower with no sun and water (may be useful to split page into 3 columns)

Write their prediction: Make sure they are answering the question do they think these plants need the same amount of sun and water? LAPs/ SEN to have a writing template

Now think about how will we know the answer? What could we do? Think we will have to make observations

Results – Draw the cactus and flower how it looks now and label around it the colour/ flowers etc... Then draw a results table –

	Control	Sun and no water	No sun and water
cactus			
Flower			

Now ask the children – will you water all the plants? Highlight that all plants will need to be watered except the one with no water. Children to then set up experiment.

Reflect We will look at the results in 3 weeks time. Give them a small beaker so that they are able to water the plants through the coming weeks. Keep checking on this.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 – To set up simple practical enquiries, comparative and fair tests. FROGS fair testing Type of scientist – I set up my own simple 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? **ExPlore** https://explorify.uk/en/activities/the-big-question/why-don-t-all-plants-look-the-same If didn't last time draw results table and Recap the question Do all plants need the same amount of water and sun? Recap what our experiment was. **Learn** Lets look at the plants now……. Discuss.. **Respond** Fill in results table looking at colour of stem, flowers, droopiness of stem etc… **Learn and respond** Lets write a conclusion together. Laps/ Maps (some) to have a PEE flap book. HAPS – in books Model how to write each part – Laps to do with teacher. P – I found out plants do not need the same amount of water and sun. E – My evidence shows that the cactus survived without water but the flower did not E – my prediction was …… because If able some Haps can have a go at doing a ! what would they like to find out next time? **Reflect** Go outside into the garden, look at the plants and trees around. What can you see that will need more water (flowers and food in flower beds) what will need less water (trees because their roots are far into the ground) find a place to lay down and just listen and think about nature and how lucky we are to have nature around us and how we need to look after it. Scientific enquiry – 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 FROGS observation over time	

Type of scientist – I explain what I have found out using speaking and writing. 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? https://explorify.uk/en/activities/what-if/you-only-ate-chips 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=GaLvxVnn8Yg 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 Type of scientist – I use relevant scientific language. 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? https://explorify.uk/en/activities/the-big-question/what-food-helps-to-keep-us-healthy 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 Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. 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?	

https://explorify.uk/en/activities/what-if/my-bones-were-bendy 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 Type of scientist - I use relevant scientific language. LO: To identify that humans and some other animals have skeletons. Christian Value: friendship	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, carpel, scapula, vertebral
2. What is the purpose of our skeleton? What are your joints? Big question - What if humans had wings? 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 and star upright (vertebral column) How else does our skeleton help us? Movement. Go through the three different join 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. Type of scientist – I use relevant scientific language. LO: To identify that humans and some other animals have skeletons and muscles for support, protection and movement. Christian Value: Perseverance	column, femur, patella, phalanges
3. What is an endoskeleton / exoskeleton / hydrostatic skeleton? https://explorify.uk/en/activities/odd-one-out/funny-bones 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/zg2qxnb 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/z8mbqhv 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-eJ_E https://www.youtube.com/watch?v=A2j_TQCGYJk 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 Type of scientist – I use relevant scientific language LO: To identify that humans and some other animals have skeletons and muscles for support, protection and movement. Christian Value: respect	
7. How do our muscles work?	

Explore https://explorify.uk/en/activities/odd-one-out/hanging-out Today's question – how do muscles work? Recap bones in body/ types of skeletons/ functions (this should be really quick) **Learn** https://www.bbc.co.uk/teach/class-clips-video/science-ks2-how-do-muscles-and-bones-work/zfgtscw How do bones and muscles work video. Highlight Muscles can only pull, they can't push. This is why our joints are controlled by more than one muscle. Muscles work in pairs. Go through the power point on muscles. Remind the children which muscles are the biceps and triceps. Make a moving arm model using twinkl resources, or use the skeleton or just video clip to show how muscles work in pairs. **Respond** On seesaw children to either record or type what they have found out about muscles using the stills from the video clip. Ensure children use word bank to help them. **Reflect** Recap and highlight KO Scientific enquiry – Make systematic and careful observations. Raise their own relevant questions about the world around them Type of scientist – I make careful observations. 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	**Key Vocabulary**

1. What are the three types of natural rocks? https://explorify.uk/en/activities/the-big-question/why-don-t-all-rocks-look-the-same Where do we find rocks? Children to learn that rocks re 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 sweet 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 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 Type of scientist – I use relevant scientific language. LO: To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Christian Value: Perseverance	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, quart, rock, sand, sandstone sedimentary, separation, slate, soil type (clay, peat, sandy) stone, surface, texture
2. What rocks are permeable / impermeable? Big question – what if everything was waterproof? 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 Type of scientist – I set up my own simple tests. 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? https://explorify.uk/en/activities/odd-one-out/building-with-rocks 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 ad 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 Type of scientist – I set up my own simple tests. 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?	

Explore https://explorify.uk/en/activities/the-big-question/why-don-t-all-soils-look-the-same What do you know about soil? What is it?

Learn 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 chidlren 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.(on PowerPoint in resources)

Respond Using the diagram, children to label the different layers, colour if time and stick in books. Take photos of soil for seesaw.

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

Reflect Watch https://www.youtube.com/watch?v=FBd6du_3tDw BBC science clips rocks and soil for consolidation 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

Type of scientist - I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To recognise that soils are made from rocks and organic matter. Christian Value: compassion,	
4. How are fossils formed? https://explorify.uk/en/activities/odd-one-out/frozen-in-time 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. Type of scientist - I explain what I have found out using speaking and writing. 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? https://explorify.uk/en/activities/odd-one-out/animal-fossils 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 Type of scientist – I use relevant scientific language 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 **Explore** https://explorify.uk/en/activities/problem-solvers/if-fossils-could-talk Fossils flashback – how are fossils formed? What are they? **Learn** Ask children to think about how we know about the past. As 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. **Respond** Children to look at fossils with 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. Use the Collections key sheet to label what they are. Then use google to find out what they were e.g. ammonite – extinct marine molluscs **Learn and respond** Extension – DK Findout thinking frame **Reflect** Self mark the answers – go through on the board AND / OR Watch the video on Mary Anning https://www.youtube.com/watch?v=qNOh-85_Dmc 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. Scientific enquiry – To use straightforward scientific evidence to answer questions or to support their findings. FROGS research Type of scientist – I make careful observations. 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? https://explorify.uk/en/activities/odd-one-out/sources-of-light 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 Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To recognise that they need light in order to see things and that dark is the absence of light Christian Value: thankfulness	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
2. What material is the most reflective? https://explorify.uk/en/activities/what-if/we-didnt-have-mirrors 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 (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 Type of scientist – I set up my own simple tests. LO: To notice that light is reflected from surfaces Christian Value: friendship	
What do the words translucent, transparent and opaque mean? https://explorify.uk/en/activities/odd-one-out/shine-on 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 Type of scientist – I make careful observations. 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? https://explorify.uk/en/activities/odd-one-out/in-the-shadows 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 beaus. 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 blocks 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. Type of scientist – I set up my own simple tests. 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? Explore https://explorify.uk/en/activities/odd-one-out/shiny-things What do you remember about light? On board display different elements covered this year and discuss. **Learn** – Where do you think the lightest part of the school is? The darkest? Is there a way to find out? Show the children the science Arduino app (datalogger app). 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 work 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. Where could we put these data loggers? Get ideas and share. Children when conducting experiment can take IPAds to different locations around the school. Pose the question – *Where is lightest place in our school?*	

Respond Children to write their prediction in books. Children to then use the data loggers to investigate different locations around the school. **Reflect and respond** Children to write a short PEE conclusion in their book about what they found out. Can choose lift the flap if needed E.g. I found out the …….. was the lightest place in the school. This is because there was the most amount of light. My evidence shows the data logger read …. Lux. My prediction was ….. 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 Type of scientist – I use different equipment to measure accurately in standard units. 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? https://explorify.uk/en/activities/odd-one-out/in-the-shade Where was the lightest place in school? Why was it the lightest? The lightest place was where there was the most sunlight. **Learn** So how safe is the sun? (On powerpoint) Sort statements intro 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 out 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. **respond** Children to create a poster on sun safety. They must include how the sun can be dangerous and how they can protect their eyes. **Reflect** -what advice would you give the reception children as they spend a lot of time outside. Children to create a poster on sun safety. Christina 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. Type of scientist – I explain what I have found out using speaking and writing. LO: To recognise that light from the sun can be dangerous and that there are ways to protect their eyes Christian Value: truthfulness	
Feedback:	

Year 3 Forces and Magnets Physics	
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. What is a force? https://explorify.uk/en/activities/odd-one-out/give-it-a-pull Children to learn that a force ca 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	Attract, bar magnet, aluminium, brass, contact force, copper, direction,

force to the limo? Give the children a car. Can they make them change speed? Direction? 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. Type of scientist – I ask my own questions. I use different ways to answer them. LO: To notice that some forces need contact between 2 objects, but magnetic forces can act at a distance Christian Value: respect	distance, faster, force, friction, gravity, horseshoe magnet, iron, magnetic force, magnetic material, metal, north pole, poles, south pole, pull, push, repel, slide, slower, smooth surfaces, spin, steel, strength, stretch, twist
2. Which surface creates the most friction for a toy car? Big question – what if... 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 hols 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 y 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 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.	

Type of scientist - I set up my own simple tests. LO: To compare how things, move on different surfaces Christian Value: friendship	
Which surface creates the most friction for a toy car? Big question - what if... 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 Type of scientist - I draw simple conclusions and make predictions for new values. LO: To compare how things, move on different surfaces Christian Value: Perseverance	
3. What materials are magnetic? https://explorify.uk/en/activities/what-if/you-had-magnets-for-fingers 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/zcntsbk 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. Type of scientist – I suggest improvements and raise further questions. 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? https://explorify.uk/en/activities/odd-one-out/pull-together 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/zpvcrdm 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/zfnyrj6 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.	

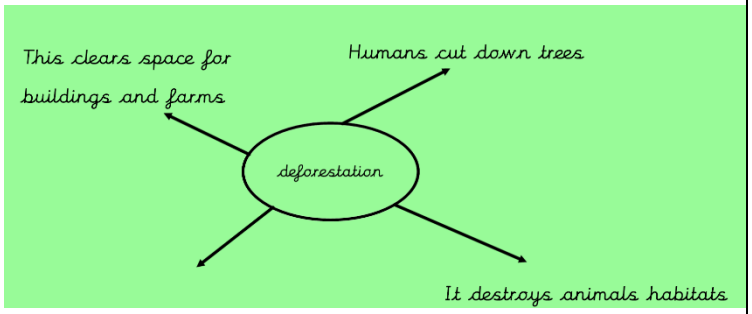
Type of scientist - I make careful observations. LO: To describe magnets as having 2 poles. To predict whether 2 magnets will attract or repel each other, depending on which poles are facing. Christian Value: respect	
Feedback:	

Year 4 Living Things and their Habitats Biology	
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. How could we group living things? (Opportunity for outdoor learning - living organism hunt) **Explore** BIT https://explorify.uk/en/activities/odd-one-out/different-homes What do all the animals have in common? What characteristics are there that all living things share? Watch video https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zfhfn9q Can anyone remember the mnemonic Mrs Gren - what are the 7 life processes we looked at last year. Go over them. Mrs Gren - movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. **Learn** 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 Explain that living things can also be grouped in a variety of ways.? Plants and animals etc... Show them the next set of animals how can these be grouped? Take suggestions Give out pictures of animals (see resources) - there should be only pictures of	Amphibian, bird, classification key, consumer, deforestation, differences, ecological, environment, fish, flowering plants,

mammals, birds and reptiles. Children to sort out the pictures in any way they want to. How have they done it? Share and feedback. Can they sort this another way? Give the children the headings of the animals bird reptile and mammal. Can they now sort them using these headings? **Respond** Choose a picture of a bird and stick it in their books and write the heading bird. Around the bird can they write what they know about birds? Repeat this for mammal and reptile Then introduce the key vocabulary for these 3 groups and go over what features each group have. Then in a different colour around the pictures they have chosen add what they have learnt about the animals Mammals – warm blood, hair or fur, mammal babies are born alive, mothers feed babies milk Reptiles – live on land and some in water. They have lungs and breathe air. They have scales and are cold blooded. Lay eggs on land. Birds – warm blooded. Beak, wings, feathers, two legs and lay eggs on land. **Reflect** What am I? I have warm blood (What could I be? Bird or mammal) I lay eggs (what am I bird) I have wings but do not fly. I am black a white – penguin. Repeat with other animals. Scientific enquiry – To gather, recording, classifying, and presenting data in a variety of ways to help in answering questions. FROGS grouping and classifying. Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To recognise that living things can be grouped in a variety of ways Christian Value: respect,	grasses, human impact, 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? (Opportunity for outdoor learning – what microhabitats are around our local area/school. What would happen if they were no longer there?) **Explore** BIT https://explorify.uk/en/activities/odd-one-out/pollution-everywhere or https://explorify.uk/en/activities/the-big-question/what-impact-do-our-choices-have-on-habitats What are the key features of mammals? Birds? Reptiles? Recap from previous lesson. **Learn** Watch a video about climate change https://www.naturalcurriculum.co.uk/climate-change-3/climate-change-2/causes/ short clip on Great Thunberg what is climate change? 'A YEAR to change the world' Climate change is having an impact upon our environment. There are many other environmental changes	

that are also affecting our environment we are going to be looking at a few today and what they are……
https://www.bbc.co.uk/teach/class-clips-video/science-ks2-changing-environments/zmgr4xs?scrlybrkr=d5436933

Respond Have different tables children to move around and find out about the environmental changes and fill in their sheet – Change in the environment – Impact on habitat – Effect on living things See resources for fact sheets on urbanisation, natural changes, changes caused by humans, deforestation, pollution and invasive species.



Learn Feedback to class and share ideas on board. Model to the children how to turn this information into a poster on – how can the environment be changed?

Link around edges all changes and then how this can impact on animals etc…

Extension *The following animals are classed as endangered. Can you find out why this is in each case?*

- *Orangutan*
- *Blue Whale*
- *Red Panda*
- *Sea Turtle*

Galápagos Penguin

Reflect *What can you do to help stop environmental changes?*
Discuss that we need to show compassion towards these animals and respect their importance in our world.
Scientific enquiry – To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions FROGS research

Type of scientist - I ask my own questions. I use different ways to answer them.

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

Christian Value: compassion, respect,

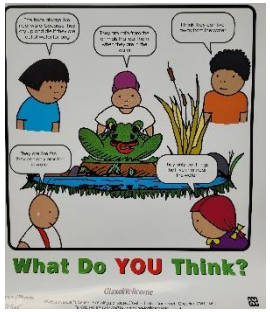
3 What are the features of the vertebrate groups, fish and amphibians?

Explore BIT which is the odd one out and why. Think of two reasons for each - dog, frog, robin, fly. Recap MRSGREN (seven life processes) We know animals can be grouped in a variety of ways. Recap pervious learning upon the 3 vertebrate group we have already done Birds, mammals and reptiles. What features are special to these animals? Children to do this on whiteboards. When done look back at previous learning in book to remind themselves of other features they may have missed. All of these animals have what type of skeleton? Endo and this means they are all .... Vertebrates.

Learn What other animal groups are there? Fish and amphibians. What do we know about them? Go over the key features of these groups. Fish - live in water, fins instead of legs, gills instead of lungs, lay eggs in water, cold blood and scaly skin. Amphibians - live on land and in water, have gills when they are young, smooth skin and lay eggs in water,

Respond Children to add the features on a spider diagram in their book by creating two diagrams, one for fish and one for amphibians. Play a game of What am I? Read the statements one at a time and see if they can guess what animal group it is. Invite the children to use their knowledge to have a go at saying the features and seeing if the class can discover which animal group they are. Children to write a few What am I's in their books set out like I did on the board.

Reflect Play 20 questions and split into teams and the children can choose a specific animal not just an animal group. What do you think task - see picture.



Scientific enquiry - To gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. FROGS - grouping and classifying

Type of scientist - I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables.

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

Christian Value: thankfulness	
4. What are the features of invertebrates? (Opportunity for outdoor learning - school garden invertebrate hunt) **Explore** BIT https://explorify.uk/en/activities/odd-one-out/legs-eleven **Learn** Open power point and go over the groups of invertebrates - can any of them remember exo skeleton and hydrostatic skeleton from year 3? We are going to go hunting for invertebrates - where may they find them? How do we handle them? **Respond** Children to work in pairs and go into the garden and see what they can find identify and name invertebrates and tick off the ones they find. Children to take iPad out and take pictures of what they find. Children can capture an invertebrate specimen to take back to the classroom. Have a close look at the invertebrates we have found using magnifying glasses. Laps to use iPad and talk about what animals they found answering the questions Where did they find the animals? What features does it have? Maps Draw and label the parts of the body. Where was their habitat? Haps to include All the above and type of skeleton. And some facts from the invertebrate sheets of the type of invertebrate they have found **Reflect** What features do all the living things we found today have in common? - all invertebrates. Highlight to the children that we are being spiritual and ask the children to take a moment to appreciate our garden and all the living things that live there. Scientific enquiry - To gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. FROGS - grouping and classifying Type of scientist - I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To recognise living things can be grouped in a variety of ways Christian Value: thankfulness	
5 Can you create a classification key?	

Explore BIT https://explorify.uk/en/activities/odd-one-out/lunchtime Can you remember the five vertebrate animal groups? Name them and then see if they can remember the key facts, they have learnt about them? Recap invertebrates what are they? Can they remember any categories (focus upon insects/ annelids) **Learn** Go over the term characteristics and in pairs sort characteristics of cats into characteristics of domestic's cats and those that are not. Discuss the difference between these, explaining the that the characteristics of a living thing are statements that are always or typically true of the species, not statements that apply to an individual of the species. Go over we already have key characteristics of animal groups – have a set of animal sheets on science help desk if needed. **Respond** Provide the children with an example of a classification key. Give the children the opportunity to have a go by themselves to complete the key with their partner. LAP MAP animal classification key. HAP minibeast classification key. Go through the answers. Leave on the tables for support for children later. **Learn** On the board display a mouse, zebra, snail, and ladybird. How could we split them into two groups? E.g., Is it an invertebrate? Is it a vertebrate? Is it a mammal? Model to the children how to create a classification key starting with one of these questions. How could we then split these into two groups again? Tell the children that for a classification key to be finished, there is only one animal in each branch. Remind the children that they have got their books with their work from pervious lessons on the different animal groups which they could use. Now display an elephant, robin, penguin, and frog. How could we classify these animals? Create a classification key together. On the board display spider, snail, fish, and human. Ask the children to turn this into a classification key with their partner on a whiteboard. Go through the children's keys. Have they done it correctly? Share good examples. **Respond** Provide the children with four animals. For those struggling keep with T, keep until they are ready to work independently. Others work independently creating classification keys in their books. On help desk put different sets of animals for the children to classify when they are ready. Also put A4 template of classification grid for support and animal groups fact sheets. Children to only classify four animals at a time. Do not increase the number of animals. Extension – How else could you classify the same animals? Could you change the questions used?	

Reflect On the board have a classification key that is split into three and one. Then the three split again into two and one. And then one and one. Is this correct? Why? It does not matter how the animals are split as long as at the end of the key each animal is in their own group Christian value of thankfulness of the variety of animals in our world. Scientific enquiry – To gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. FROGS – grouping and classifying Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. LO: To explore and group four animals using a classification key. Christian Value: thankfulness	
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	Key Vocabulary
1. What are the functions of the four types of teeth? **Explore** BIT https://explorify.uk/en/activities/odd-one-out/what-would-they-eat What do you know about teeth? **Learn** Can they guess what animals the teeth belong to? How do the different teeth help them to eat their food? Recap terms herbivore, carnivore and omnivore. Which one are humans, as a general rule? How does this affect which teeth we need? 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	Anus, blood, blood vessels, canines, caron dioxide, carnivores, cavities, consumer,

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? Watch the BBC clip highlighting the function of the different type of teeth. https://www.bbc.co.uk/bitesize/topics/z7x78xs/articles/zsp76yc **Respond** Children to create the teeth using playdoh. Draw and label teeth in books and add a description of each types function. Extension/challenge Why do humans need different types of teeth? Explain **Reflect** So why do humans need different types of teeth? Do animals have the same types of teeth as humans? Compare. Why don't they? - 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. Scientific enquiry - To gather, recording, classifying and presenting data in a variety of ways to help in answering questions FROGS grouping and classifying Type of scientist - I use relevant scientific language. LO: To identify the different types of teeth in humans and their simple functions Christian Value: respect	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
2. What drink will affect our enamel the most? - week 1 Consumables **Explore** https://explorify.uk/en/activities/what-if/toothbrushes-didnt-exist Recap names and functions of teeth. Go over actions. Incisors - sounds like scissors - cut/bite. Molars(fists together look bumpy) - grind Canines - rip/tear - we use knives and forks so need fewer! **Learn** How do our teeth enable to eat an omnivore diet? Recap milk teeth and that when they fall out, the adult set has to last. How can we look after our teeth? Group discussion and feedback. Watch clip on brushing teeth https://www.dentalhealthcareeoe.nhs.uk/your-teeth/ Children to learn what enamel, cavities and plaque is and how they affect our teeth. - Plaque - a soft sticky film that builds up on your teeth that can cause	

gum disease and tooth decay Cavities – a hole in your tooth caused by tooth decay Enamel – the hard outer surface of your teeth which protects from tooth decay Recap 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. Explain that we will be setting up an experiment but we cannot use real teeth so we are going to use eggs as their shell is protecting the egg and is like the enamel on our teeth. We want to find out how to protect it and which drink will affect our enamel the most and to do this we need to conduct a fair test experiment by observing over time. So what things could we change in this experiment? Give children a coloured post it note to write on e.g. change the drink used?, change the amount of liquid used? Location? Temperature of liquid? Type of egg? Then ask the children what they are going to measure? Observation – the appearance of the egg In threes children to choose a post it note of what they are going to change – type of liquid. So if it is a fair test what is going to stay the same? – all the other elements on the other post it notes. – amount of liquid, location, type of egg, temperature of liquid. This is the fair test. Only one variable can change (liquid) the other variables will stay the same to keep the test fair. **Respond** Give the children access to a variety of drinks – hot chocolate, coffee, squash, pure orange juice, milk, coke etc. In their threes they need to choose the drinks that they are going to test. In books children to write up Question fair test and prediction part of their experiment. Children to set up experiment and leave for a week. **Reflect** How will we know which drink will affect enamel the most? What might we see? – plaque, cavities or tooth (egg) decay? Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment Scientific enquiry – To set up simple practical enquiries, comparative and fair tests FROGS observation over time Type of scientist – I set up my own simple tests. LO: To set up a simple practical fair test to identify which drink affects enamel the most.	**Consumables** **Lesson 2** 1 egg per child Selection of drinks needed **Lesson 4** Tights Banana Cracker Pure orange juice

Christian Value: respect, friendship	
3. What drink will affect our enamel the most? - week 2 **Explore** BIT https://explorify.uk/en/activities/odd-one-out/healthy-drinks Vocab recap -cavities, enamel, plaque, tooth decay, incisor, premolar, molar and canine. How do 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. **Learn** What question are we answering? What drink will affect enamel the most? How could we record our results? Model to the children how to create a table in their books, one column being drink and the other observation of egg. **Respond** Children to draw their own table in their books and fill in headings and drinks. **Teach and respond** Children to collect their eggs and sit in their threes. What have you found out? Teacher to model each section of a PEE conclusion, one at a time, giving children time to respond in their books after each sentence. 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 like cavities. My prediction was correct/incorrect because... **Reflect** Verbally - what advice would you give people about what they are drinking? - E.g. milk is a good drink because the calcium protects the teeth. You can drink coke but make sure you brush your teeth properly afterwards because otherwise you might get cavities. Children to show the Christian values of friendship and respect as they work together to conduct their experiment. Scientific enquiry - To use straightforward scientific evidence to answer questions or to support their findings. FROGS observation over time Type of scientist - I make careful observations. LO: To use scientific evidence to answer questions by identifying which drink affects enamel the most. Christian Value: respect, friendship	
4. What are the main parts of the digestive system? **Explore** https://explorify.uk/en/activities/what-if/we-had-no-teeth Recap - why do we need different types of foods? - keep us healthy. Who can remember the food groups and their functions? Teeth quiz. **Learn** Show a skeleton. Remind the children that this shows the skeletal system. You could take the children down to the science wall to highlight skeletal system and digestive system. 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. Work through https://www.bbc.co.uk/bitesize/topics/zcyyycdm/articles/z8bntrd and watch https://www.youtube.com/watch?v=VwrsL-ICZYo Children to learn the. Mouth Oesophagus Stomach Small Intestine Large Intestine Rectum and Anus and their functions. Route of digestion 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 **Respond** In books label a body using a word bank of the words above. LAP to not have rectum. **Reflect** what are the functions? Go through each of them again. What is the journey of our food? **Respond** children to cut and match the digestive system part with it's function. LAP simple sentences and no rectum. HAP digestive system flow diagram. Write the functions at each stage. **Reflect** Vocabulary recap. Talk partner work – how does food travel through our body? What happens at each stage? Children to show the value of thankfulness – we ae thankful for our amazing bodies and how they keep us alive.	

Scientific enquiry – To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables FROGS grouping and classifying (classifying functions of organs in digestive system) Type of scientist – I use relevant scientific language. LO: To describe the simple functions of the basic parts of the digestive system in humans Christian Value: thankfulness	
5. How does food move through the digestive system? Consumables TEACHER Watch https://www.stem.org.uk/resources/elibrary/resource/35396/digestive-system-experiment Before lesson **Explore** https://explorify.uk/en/activities/odd-one-out/our-digestive-organs Today's question How does food move through the digestive system? Show the children parts of the digestive system from last week. What can they remember? Part names? Functions? **Learn** Watch operation ouch video on digestive system https://www.youtube.com/watch?v=AX34MoaLmzE. Children can follow the foods journey using their sheet from last week. Go through PowerPoint on function of each part of the digestive system again and complete quiz. 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. **Respond** take pictures to put on seesaw – set up an activity and children to take pictures as we go. Practical investigation in threes using tights, plastic food bag, banana, orange juice, cracker and water to practically pass food through the digestive system. 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. 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. LAPs fill in the gaps. Widget cards accessible for all. E.G first the food goes into the stomach etc Extension dk find out digestive system, In books write three new facts you found out. **Reflect** What did you find out? How is food digested? What journey does it take? Children to show the Christian values of friendship and respect as they work together. Scientific enquiry - To ask relevant questions and using different types of scientific enquiries to answer them FROGS observation over time Type of scientist - I explain what I have found out using speaking and writing. LO: To describe the journey food takes through the digestive system. Christian Value: respect, friendship	
6. Can you construct a food chain? (Opportunity for outdoor learning - animal hunt. Where would they be in a food chain. What would come before them? After?) **Explore** https://explorify.uk/en/activities/odd-one-out/tasty-web What are the seven life processes? MRS GREN - movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. Where do humans get their nutrition from - the food/drink we eat/consume Learn What is a food chain? All animals and plants need food to live and they are all part of a food chain. Look at https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/zwxwkty 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. Leaf - worm - bird. What does this show? A leaf is eaten by a worm and a worm is eaten by a bird. What do the arrows mean? The arrows show the flow of energy. Which is the producer? Which is the prey? Which is the predator? Look at other examples of food chains. Corn-mouse-owl. Carrot-rabbit-fox corn-mouse-snake-owl grass-grasshopper-frog-snake-bird	

Give children a set of vocabulary definition cards and in pairs children can sort them out and match them up. Go through answers on board These words to include – herbivore, carnivore, omnivore, producer, consumer, prey and predator. Make sure they are clear on these definitions **Respond** Give children animal picture cards – how many different food chains can they make? _share and go over as a class modelling how to write these on board labelling underneath with the correct words producer consumer prey predator In books children to draw/ write the food chains in their books. Sen/laps – producer/ consumer/ consumer – Maps – producer and 3 consumers labelling with consumer prey predator and producer Haps – producer and 3 consumers labelling with primary consumer, prey predator and producer and herbivore, omnivore and carnivore. **Reflect** On the board display a food chain containing mistakes. E.g. arrows facing the wrong way. Animals not in the correct order. What do they children think of the food chain. Ask them to identify the mistakes. 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 – To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables FROGS seeking patterns. Type of scientist – I ask my own questions. I use different ways to answer them. LO: To construct and interpret a variety of food chains, identifying producers, predators and prey. SEN To construct and interpret food chains. 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	Key Vocabulary
1. What is a solid, liquid and gas? (Opportunity for outdoor learning – solid liquid and gas hunt) **Explore** Odd one out – coke, table, balloon (or anything with gas) **Learn** Ask the children to collect different objects from around the room and provide them with pictures of a range of solids, liquids and gases. E.g. glass, tea, clay, lemonade, sugar, hot air etc and ask the children to classify them. How have you grouped them? Why have you grouped them this way? 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. Watch video http://www.bbc.co.uk/guides/zsgwwxs A solid is a shape that keeps its shape unless a fore 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 affixed 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. **Respond** Ask children to draw a table in their books. Split into three columns and put headings, solids, liquids and gases. Using the pictures from before as support and their own ideas, children to classify objects into the three groups and record in books. LAP can stick the pictures in. HAP MAP write words. HAP to include own ideas too. **Reflect** Match the properties to the correct state using the statements from above. E.g. match solid with can be cut, squashed or torn and keeps its shape. Liquid – can be poured, takes the shape of the container it is in. Gas – does not have any fixed shape, spreads out to fill a space. Scientific enquiry – To identify differences, similarities or changes related to simple scientific ideas and processes FROGS grouping and classifying. Type of scientist – I use relevant scientific language. LO: To group materials together, according to whether they are solids, liquids or gases	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 Consumables Lesson 3

Christian Value: respect	Jelly **Lesson 4** chocolate
2. What are the properties of solids, liquids and gases? **Explore** https://explorify.uk/en/activities/odd-one-out/gas On board ask them to sort different objects into solid liquid and gases. Children to recap solids, liquids and gases. E:G A liquid can be poured and take the shape of a container. Solids keep their shape and the volume stays the same. Solids can be held and stay in the same place. A gas does not keep its shape and can fil any room or space it is in. A gas can be squashed. **Learn** 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. Watch https://www.youtube.com/watch?v=RuP5FmFcPmY on particles. **Learn / Respond** Give the children some counters. Children to use them to show the particles of a solid. Repeat with a liquid and a gas. Teacher to observe how the children are arranging counters to assess understanding. Ask children to create a state of matter using the counters. Can their partner say what state they are in? What properties will that state have? E.g. takes shape of container. 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. **Respond** Children to cut and match states of matter to their particles and properties and stick in book. LAPS state – particle arrangement – particle properties. MAP HAP state – particle arrangement – particle properties – material properties. **Reflect** Show video of people pouring sugar onto the table. https://www.youtube.com/watch?v=W4oxVw9pLyY What state is sugar? Why? What do you think? Is it a solid/ liquid or a gas? Can you explain your reasons? Identify they are very small pieces of solid. (particles) Some solids come in different 'sizes'. Explain that although they pour, they make a pile. Therefore some solids behave as liquids.	

Scientific enquiry – To gather, recording, classifying and presenting data in a variety of ways to help in answering questions FROGS grouping and classifying.
Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables.

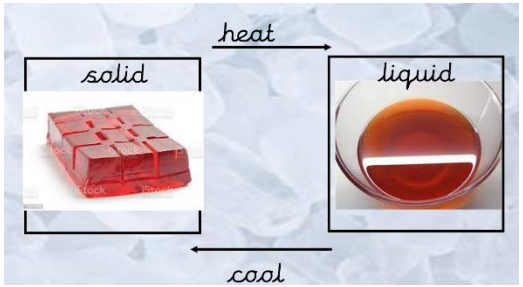
LO: To know the properties of and how the particles behave in a solid, liquid and a gas.
Christian Value: friendship

3. Can jelly change state?

Explore https://explorify.uk/en/activities/what-if/water-couldnt-freeze Hold up a piece of paper. How do we know it is a solid – can be ripped/torn, fixed volume, particles closely packed together.

Learn Give the children an ice cube. What state of matter is it? What is happening to it? What state is it changing into? How do we know it's a liquid? Why is it changing – heat. Leave ice cubes on table for them to continue melting.

Give every child a cube of jelly. Look at jelly. What state is this in? How do we know? What could we do to change the state of the jelly? Heat it – demonstrate. Ask the children to combine their jelly and dissolve in a beaker. The jelly is now in a liquid state. What state is jelly in when we eat it? How do we turn it into a solid? This is a reversible change.



How could we use a diagram to represent this.

Jelly block – liquid jelly

Add cooling, melting, solid and liquid to the diagram.

Thinking back to the ice. What does the ice cube look like now? Could we return it back to ice? What change is this?

Respond Independently children draw their own diagram in their book on ice.

In books – explain what is meant by a reversible change.

HAP What other solids would this happen to? Or other examples of a reversible change.

Reflect Oops. I've left my chocolate bar outside in the sun. What has happened to it? It has melted? Can I get it to go back to a solid? Cool it. What type of change is this? Scientific enquiry – To use straightforward scientific evidence to answer questions or to support their findings FROGS observation over time. Type of scientist – I draw simple conclusions and make predictions for new values. LO: To observe that some materials change state when they are heated or cooled. Christian Value: respect, friendship	
4 What is the best temperature for melting chocolate? Consumables needed **Explore** odd one out – ice sand and honey. Recap melting cooling jelly diagram from last time. On whiteboards can they draw one relating to ice and water. **Learn** 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? On the board model to the children how to draw the method for this experiment. Three beakers, water inside each beaker (one cold, warm and boiling) foil boat for one piece of chocolate to go in each boat. Experiment to be conducted in threes. Verbally – How can we keep this a fair test? Same type of chocolate, same amount of water, same size chocolate, same amount of time. **Respond** In books children to write question and prediction. Children to draw a results table. Four columns and three rows. In columns beaker 1 beaker 2 beaker 3. In rows temperature of water and observation after 5 minutes. Children to pour water in beakers and record temperature before putting the chocolate in the foil. Observe what happens to the chocolate and record results in table. What has happened? In books write a simple conclusion – I found out that the warm water (temperature) melted the chocolate this quickest. This happened because the heat made the chocolate	

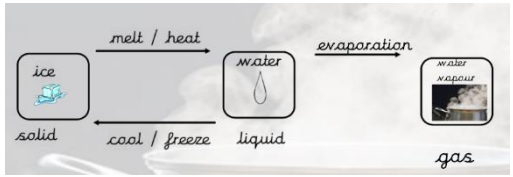
change state. (HAPS The chocolate changed state because the particles moved quicker when the heat was added) My results show that after 5 minutes the chocolate above hot water had melted. **Reflect** – Maya wants to make some chocolate crispy cakes, so she melts some chocolate and mixes it with rice crispies. To make sure they are solid before her party, she is going to put them outside to turn into a solid quicker. Is this idea a good one? Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry – 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 FROGS observation over time. Type of scientist – I use different equipment to measure accurately in standard units. LO: 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) Christian Value: respect, friendship	
5 What is evaporation? **Explore** BIT which is the odd one out – hairdryer, washing line, tumble dryer? Recap SLG Look back at the reversible change diagram from the jelly lesson. What does this tell us? **Learn** Provide children with the statements on evaporation on how do wet clothes dry. (see resources for statements) LAPs in a group with teacher for assistance with reading / or mixed ability pairs. What are there thoughts. Who is right? Go through the answer. The particles in a liquid have energy and are moving around each other quite fast. Some of the particles move so quickly that they turn into a gas and move away from the liquid. This happens quickly id the liquid is boiling, but when clothes are drying it is not that hot so I think it just happens slower. Eventually all the particles will have changed unto a gas and the clothes will be dry.	

Listen to evaporation song https://www.bbc.co.uk/cbeebies/watch/do-you-know-evaporation-song
Go back to the reversible change diagram on water/ice. Add another box.

How could we add evaporation to this diagram?

Respond In books what is evaporation? Explain by drawing a diagram to show the reversible change.

MAP HAP can you give some examples of evaporation – draw, label, write



Reflect On the board show a puddle drying up. https://www.youtube.com/watch?v=HuF0Xg4MIJI
What is happening? What affects how quickly the puddle dries up?

Scientific enquiry – To identify differences, similarities or changes related to simple scientific ideas and processes FROGS observation over time.
Type of scientist – I use relevant scientific language
LO: To know what evaporation is.
Christian Value: respect, friendship

6. Where will socks dry quickest? (Planning the experiment)

Explore https://explorify.uk/en/activities/have-you-ever/needed-to-dry-something-quickly What can you remember about solids liquids and gases? – tell your partner 5 things. Recap what evaporation is.

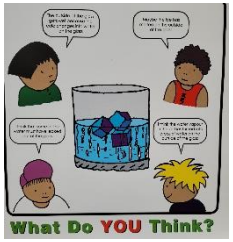
Learn Pose the question – where will our socks dry quickest? Tell the children that we are going to use their knowledge of evaporation to investigate where socks will dry the quickest. This investigation is to focus on fair testing. Ask the children to get into threes. How will we answer this question? What will we be changing? – the location. So what will need to stay the same to keep the test fair? Give the threes some post it notes and ask them to write each of their different variables on a post it. E.g. same type of sock, same amount of liquid, same temperature of liquid, same amount of time. Take the children's ideas and model writing a fair test on the board, reminding the children that one variable changes and everything else has to stay the same for the experiment to be fair.

Respond Children in books plan experiment, including the question, fair test, prediction.

Learn and respond How will we record our results? Draw a table on the board and ask the children to draw the table in their books. What headings will we need in our table. Identify that the first column is a list of what we are changing - location. What are we measuring? This will be the heading of the other column. Children could measure how much water has evaporated or the children can rank the socks in order from driest to wettest. Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry - To set up simple practical enquiries, comparative and fair tests FROGS fair testing. Type of scientist - I set up my own simple tests. LO: To associate the rate of evaporation with temperature. Christian Value: respect, friendship	
7. Where will socks dry quickest? (Opportunity for outdoor learning - hanging socks outside in different locations) (10 minutes to set up, then leave socks for as long as possible before recording results) Another lesson can be taught while waiting for socks to dry. **Explore** https://explorify.uk/en/activities/the-big-question/how-can-we-slow-down-evaporation-to-make-sure-that-wildlife-can-drink Recap experiment on where will socks dry qui9ckest. **Respond** Set up the experiment. Leave socks for as long as possible. Then children to collect socks and record results in table. They could rank them driest to wettest, or weigh to see how much water has evaporated. **Reflect** - verbally where did socks dry the quickest? Why do you think this is? Scientific enquiry - To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables FROGS observation over time. Type of scientist - I make careful observations. LO: To associate the rate of evaporation with temperature. Christian Value: respect, friendship	
8 Where will socks dry quickest?	

Explore https://explorify.uk/en/activities/odd-one-out/sensing-evaporation **Learn** What did you find out from your sock experiment? Look at results table. Where did socks dry the quickest? Why did they dry quicker there? **Respond** Children to use their results to write a PEEL conclusion – point, evidence, explain if they were correct in their prediction, link to original question Depending on class this may be independent or it may need modelling. E.g. PEEL. I found out that my socks dried quickest on the radiator. This happened because the water evaporated. My results showed that the socks on the radiator were the driest. My prediction was correct/'incorrect because. Therefore if you want to dry your socks quickly put them in a warm place. **Reflect** I have just washed my hair and it needs drying. What advice would you give to help me dry my hair quickly? Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry – To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions FROGS observation over time. Type of scientist – I explain what I have found out using speaking and writing. LO: To associate the rate of evaporation with temperature. Christian Value: respect, friendship	
9 What is condensation? **Explore** https://explorify.uk/en/activities/odd-one-out/where-is-the-waterOn the board put the reversible change diagram up. What vocabulary is missing? – melting/heat, evaporation and cooling **Learn** What does a boiling kettle show? Liquid going into gas (steam) how is it happening? What is it called? What happens if steam hits a cold surface? – it cools and water is formed – called condensation. Return to the diagram from the explore part of the lesson and add condensation label to the reversible change diagram.	

Respond Give each table a jug/bowl and pour boiling water in. Cover with either cling film and place an ice cube on the top – observe what happens – what is it called?
Children to draw a diagram of what they have just seen happen – can they label steam, evaporation, condensation hot water, cold surface. Ask the children to include a diagram of reversible change.



Reflection What do you think? – see picture.

Scientific enquiry –To make careful observations. FROGS observation over time
Type of scientist – I make careful observations
LO: To know what condensation is.
Christian Value: respect, friendship

10. What is the water cycle? (Opportunity for outdoor learning – go outside and look at clouds)
Explore https://explorify.uk/en/activities/odd-one-out/cloud-watching What is evaporation – recap experiment we did socks drying. Evaporation is liquid turning into a gas – puddles evaporate – can you think of any other examples of evaporation …. Info on slide Evaporation you need heat! What is the opposite of evaporation? When a gas turns into a liquid? – condensation Go over the reversible change diagram

Learn What is the water cycle – 4 key stages watch videos
https://www.youtube.com/watch?v=y5gFI3pMxoI – animation explaining water cycle
https://www.youtube.com/watch?v=gBbFx160y94 – water cycle song
https://www.youtube.com/watch?v=KM-59ljA4Bs – go noodle

Respond Children to research and complete thinking frame on water cycle. Thinking frame to include each of the stages if condensation. QR codes of following links for the children to use to conduct their research https://www.bbc.co.uk/teach/class-clips-video/geography-ks1--ks2-the-water-cycle/zbcmxycn https://www.bbc.co.uk/bitesize/topics/zgwc96f/articles/z4gfp4j
https://www.dkfindout.com/uk/earth/water-cycle/

Reflect

Water cycle concept cartoon – discuss

Scientific enquiry – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. FROGS research Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables. 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 Electricity Physics	
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	**Key Vocabulary**
1. What is the difference between mains and battery appliances? (Opportunity for outdoor/outside classroom learning – electricity hunt. What can you see that uses electricity?) **Explore** https://explorify.uk/en/activities/odd-one-out/electrical-appliances	Appliances, device, battery, battery holder, break, brighter, dim,

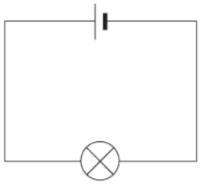
Learn What do we mean by electricity? Watch https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zsj9r2p Just watch the video. Children to learn what an appliance is. – a device or piece of equipment designed to perform a specific task. **Respond** Children to sort pictures of appliances (see resources). How have they done it? Ask the children to sort them into those that use electricity and those that don't. Discuss. Take away those that don't use electricity and just keep ones that do in front of children. **Learn** Children to learn what mains and battery electricity is. Mains electricity is where you need to plug an appliance into a socket. Mains electricity is produced mainly by gas, coal or nuclear power stations. But highlight that wind turbines, hydroelectric and solar panels also generate electricity. Appliances that use battery electricity have a battery inserted in them. Batteries store chemicals which produce an electric current. There are different types of batteries – cylinder, square or car. **Respond** Children to classify the appliances left on their tables into mains and battery electricity. 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. **Reflect** https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zsj9r2p work through the quizzes. **Learn** 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 n exposed metal wires, don't overload a socket, or leave wires on the floor. Work through https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/z9gk4xs **Reflect** What are the dangers in each of the rooms. What advice would you give? Which run on mains? Which on battery? http://www.switchedonkids.org.uk/electrical-safety-in-your-home Children to be thankful for how electricity has improved our lives and made living easier. Scientific enquiry – To identify differences, similarities or changes related to simple scientific ideas and processes FROGS seeking patterns. Type of scientist – I use relevant scientific language. LO: To identify common appliances that run on electricity Christian Value: thankfulness	bulb, buzzer, ell, circuit, circuit diagram, closed/open circuit, complete circuit, components, conduct, conductor, connect/connection, crocodile clip, electrical conductor/insulator, electricity, insulator, leads, light, mains, metal, moto, plastic, plug, positive/negative, power, safety, socket, switch, volume, wire

2. What is a circuit? (Opportunity for outdoor learning – circuits that use bulbs/buzzer/motor hunt)

Explore https://explorify.uk/en/activities/have-you-ever/had-a-power-cut-and-not-had-electricity What are the two types of electricity – mains and battery. Can you give me some examples for each.

Learn Give children electrical equipment to make up a circuit. Allow children to make up circuits, without explaining first how to connect it.

What do they need for it to work? What do the different parts of the circuit do? Use the circuits created to model how to make the bulb light up for those finding it tricky. Leave circuit equipment and as a class on IWB, match each part of the circuit with description – bulb = a device which lights up. Cell = provides the power. Wire = allows electricity to pass through it. Watch BBC clip https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqgfp4j . Teach the children the symbols for the three components they have used during the lesson – bulb, cell and wire. Highlight it is a cell not a battery as a battery is more than one. When we draw circuits we use special symbols. It is important to use a ruler! Model to the children how to draw a complete circuit. Why is it called complete – because the electricity can flow through it



Respond In books children to draw and label the three symbols and then draw the circuit they have created in a circuit diagram.

Learn Introduce a buzzer and a motor. Give half class a buzzer and half a motor. Children to make circuit. Swap over so they have had a go at both. Introduce the symbols for these and on the board model how to draw two circuits, one with a buzzer and one with a motor.

Reflect match the symbol to the word. Display a circuit that is drawn in the shape of a circle. Is this correct? Why not?

Scientific enquiry – To asking relevant questions and using different types of scientific enquiries to answer them FROGS research.

Type of scientist – I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables

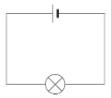
LO: To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, buzzers and motors.

Christian Value: Perseverance

3. Will this work?

Explore BIT https://explorify.uk/en/activities/odd-one-out/battery-bonanza

On the board display. What can they remember? Will the bulb light up? Does it matter which way round the circuit is? No it does not.

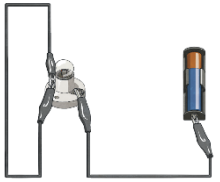


Learn

The circuit from the explore task will light up because it is a complete circuit. This means the electricity can flow through it. What will happen if the circuit is not complete? The bulb will not light up. Show the children some circuits. (see resources) Will the bulb light up?

Respond Children to predict if the bulb will/will not light up and then make the circuits to see if works and record results. Go over the answers together. Stick in sheet Challenge can they explain **why** only one circuit worked? Get children to write this answer in their book.

Reflect How could you fix this circuit? Children to show the value of perseverance when trying to get the bulb to light up.



Scientific enquiry – 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 FROGS research
Type of scientist – I suggest improvements and raise further questions.
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 an electrical conductors and insulator?

Explore BIT https://explorify.uk/en/activities/what-if/everything-conducted-electricity Look at the circuits on the PowerPoint. (see resources) Will they work How could you fix them? **Learn** Introduce words insulators and conductors and what they mean. Conductors let electricity pass through them. Insulators do not let electricity pass through. https://www.bbc.com/bitesize/articles/zxv482p - BBC bitesize clips insulator and conductor Children to recap 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.** Give the children a selection of materials from our boxes. Can you sort them into conductors and insulators? Why do you think this. Set the challenge Ernie needs to get new wire as it is so expensive – he needs some new material for wire. So what property does the material have to be – conductive. IN ABILITY PAIRS How could our sorting of materials help us? Highlight if the circuit works, the material is a conductor, if it doesn't it is an insulator. Go over the task – choose 6 items from the selection of materials to use in the experiment (make sure they pick a selection of conductors and insulators) How will we know if the material is an insulator or a conductor? **Respond** Plan experiment – including method and prediction. Draw a results table. Conduct experiment and record results. Then write their PEE conclusion I found out that the tin foil acts as a conductor This is because it let electricity pass through it. And it is a conductor. My evidence shows this because the bulb lit up. LAP Conclusion PE I found out that metals make good conductors. This happened because it lets electricity pass through it. My results show that the bulb lit up. **Reflect** What about items with mixed materials e.g. pegs, scissors. Are they insulators or conductors? Why? Draw item in book and annotate thoughts. Test it out. Were they correct? Why are conductors and insulators important? Christian values of friendship and respect as they work together to plan and conduct their experiment.	

Scientific enquiry – To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions FROGS seeking patterns. Type of scientist – I draw simple conclusions and make predictions for new values. LO: To recognise some common conductors and insulators, and associate metals with being good conductors. Christian Value: respect, friendship	
5. What is the function of a switch? (Opportunity for outdoor learning – switch hunt) **Explore** https://explorify.uk/en/activities/what-if/all-transport-was-electric Give the children bulb battery and wires – can the children make a complete circuit. On whiteboards can they draw the circuit? Assess the children's understanding. What are the symbols for a buzzer? Motor? What is a conductor? Insulator? **Learn** What circuit do we know that include a bulb, buzzer and motor in? – door bell, fan, lights etc. Do you want your door bell ringing constantly? Would you want the lights in your house to be on all the time? Why? Why not? What are the practical problems of complete circuits in everyday life? What happens when we want to turn the lights off etc.? turn the switch off. What do you think happens to the circuit when we turn the switch off? Why does the electricity stop flowing? Can anyone identify that it is because there must be a break in the circuit. Switches are used to turn circuits or electrical appliances on or off. When a switch is closed or 'on' the circuit is complete. When a switch is open or 'off' the circuit is broken. All circuits need switches to stop the battery going flat. What type of switches do you have at home? Look at all the different types of switches. We are going to make our own switches today to add to the circuits created earlier. **Respond** Children to then have a go independently to make their own switches using paperclips, bulldog clips, split pins, card. Give the children time to problem solve. If after ten minutes they have not succeeded, put the switch support card on the science help desk and then ask the children to make one. Children to draw the switch they made in their books e.g. draw their paper clips or foil whatever they use. **Learn** What does this look like in a circuit diagram. Teach the children the symbol for an open switch and a closed switch.	

Respond Then draw their circuit with the switch open (off) in symbols and label making sure the light isn't lit on their picture Then draw their circuit with the switch closed (on) in symbols with their light lit and label **Reflect** – What is the function of a switch? Does it matter where the switch goes in the circuit? Children to explore this. Children to be thankful that switches allow us to turn appliances off to conserve electricity and save our environment. Scientific enquiry – To asking relevant questions and using different types of scientific enquiries to answer them FROGS research. Type of scientist – I suggest improvements and raise further 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	
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	Key Vocabulary

1. How are sounds made? (Opportunity for outdoor learning – sound hunt. What is making the sound? Where is it coming from? What is vibrating?) **Explore** BIT What if we couldn't hear? What is sound ask Ch as a table to see what they already know about sound. Write on large paper. **Learn** Give the children a drum and some ping pong balls. Give them two minutes to explore but do not tell them why. Put the drums and ping pong balls to the side for later Watch this clip https://www.bbc.co.uk/teach/class-clips-video/music--science-ks2-what-is-sound/zbnmhbk Open PowerPoint (see resources) Work through the PowerPoint explaining how sounds are made and how we hear. 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. **Respond** (In the PowerPoint) Children act out vibration and feel their vocal cords vibrating as they speak. Children work in groups to place ping pong balls 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. **Reflect** Fill in the gap activity displayed on the board. Sounds are made when something ____ (vibrates). The louder the sound the _____ (bigger) the amplitude and vibration. The _____ (quieter) the sound the smaller the _____ (amplitude) and _____ (vibration) Scientific enquiry – To use straightforward scientific evidence to answer questions or to support their findings. FROGS research Type of scientist – I use relevant scientific language. LO: To recognise that vibrations from sounds travel through a medium to the ear Christian Value: respect, friendship	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
2. What is the loudest sound in the classroom? **Explore** BIT https://explorify.uk/en/activities/what-if/you-could-hear-every-sound-at-equal-volume Display the missing word challenge from the reflect part of last sound lesson. Can the children remember the missing words?	

Learn Pose the question – what is the loudest sound in the classroom? TASK – we are going to do some activities in the classroom and record the sound level E.g, Reading, Laughing, Walking around, Clapping, Whispering, banging trays How will we know which has the loudest sound? We are scientists. What could we use to record the sound? Data loggers. What do we measure sound in? Decibels. So if a sound is loud then the decibels recorded by the datalogger will be higher.

Respond Draw a table in books. (3 columns and 6 rows) Headings location, decibel number and what is vibrating. Write a prediction in books under the table on which sound they think will be the loudest and why. I predict .... Conduct the experiment using iPad and science Arduino app and record results. What did we discover? What was it that was Vibrating? Write a PEE from the peel conclusion to explain the experiment. SEN write on lift the flap book (see resources) LAPS _ do it supported with teacher – in books MAPS/HAPS – independent – in books E.g. 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. The children **must** include the word vibrations in this.

Reflect What do you think? – see picture.

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

Scientific enquiry – 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 FROGS seeking patterns

Type of scientist – I use different equipment to measure accurately in standard units.

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

Christian Value: respect, friendship

3. How can we change the pitch? (Opportunity for outdoor learning – what low pitch/high pitch sounds can you hear?)

Explore BIT https://explorify.uk/en/activities/odd-one-out/sounds-like-science 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, bog amplitude/ quiet sounds, small vibrations, small amplitude) Sounds travel through solids and liquids and gases. **Learn** Children will be in ability pairs and need an iPad they will record on seesaw. In pairs, give the children a glockenspiel. Give them time to explore for a few mins. What is pitch? 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. Give children more time to explore glockenspiel. What have they noticed? How do you get a higher pitch? Lower? Take photos/videos, upload to seesaw. **Respond** Children to write what they found out. Short bars high sounds long bars low sound. Let's look at some other instruments. On seesaw have a picture of a string instrument. Children to predict how they think different pitches can be made on a string instrument. **Learn** https://www.bbc.co.uk/teach/class-clips-video/music-science-ks2-how-string-instruments-make-sound/zfmd7nb Watch video from start to 3.25 this focuses on strings do we do thickness of string. Thick string makes low sound vibrates slowly Thin string makes higher sound vibrates quickly Go over and recap this lots **Respond** Back on seesaw with a picture of a recorder. How do you think you can change the pitch on a recorder? Predict on seesaw. **Learn** Then watch https://www.bbc.co.uk/teach/class-clips-video/music--science-ks2-how-woodwind-instruments-make-sound/zk3py9q watch from start to 4m 14sec this video does woodwind and pitch **Respond** Children to use their recorders to prove how to change the pitch. Write what they have found out / record and upload to seesaw. Low pitch is all the holes covered High pitch no holes covered **Reflect** Give the children each two straws. They have to make their straws have a different pitch when blowed. They have to cut a triangle in the top of each straw to do this. What are you going to need to do to the straws to make them have a different pitch? - different lengths. Which will make the high pitch, which the low? Why? Children to be thankful that we all have the ability to hear the different pitches.	

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.
Type of scientist – I ask my own questions. I use different ways to answer them.

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?

Explore BIT odd one out – sound wave (loud), sound wave (quiet) pitch sound wave. What can the remember about sound – use pictures to help support on board

Learn https://www.youtube.com/watch?v=WEoWlQOAQJ0 You're going to conduct your own sound experiment. Not on frequency but on volume. Experiment – pose question what shaker will produce the loudest sound? They will do this in ability groups of 3. How could we answer this question? What will we need for this experiment? Shakers and materials in it Explain we will be making our own shakers .. How many variables do we change during one experiment? – 1 So what could we change about this?

- Materials
- Size of shakers
- Amount of material

MAP LAP SEN will be changing the material- what material could they use? – what will they then need to keep the same.... Make sure they are clear with this.

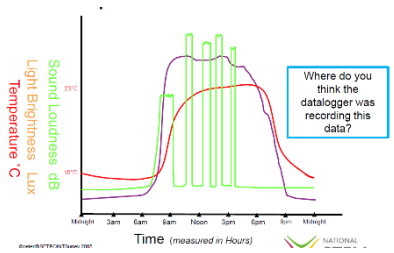
HAP – could change the size of the bottle or the amount.

Respond Children to plan using the headings – question, method, equipment, fair test, prediction. Fill in their plan. Talk through a couple of sections at a time. MAP HAP to complete independently. LAPS thinking frame.

Reflect Play a loud. Ask the children to draw the sound waves on their whiteboards. Play a louder sound. Ask them the draw sound waves again. Compare the two drawings. How do we know which is the louder sound? Play a quiet sound and repeat. Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment.

Scientific enquiry – 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 FROGS fair testing Type of scientist – I set up my own simple tests. LO: To find patterns between the volume of a sound and the strength of the vibrations that produced it. Christian Value: respect, friendship	
5 . Which shaker will produce the loudest sound? Lesson 2 (Opportunity for outdoor learning – conduct experiment outside) **Explore** BIT https://explorify.uk/en/activities/zoom-in-zoom-out/pink-and-knobHobly FROGS seeking patterns What was your experiment … what shaker will produce the loudest sound? Finish planning and making of shaker **Learn** We are scientists. How can we accurately carry out the experiment .. how can we record the sound scientifically? – data logger. What does a data logger measure in? decibels **Respond** Children to draw a table in their books to record results. Conduct experiment using Arduino science journal app to record results. (The children have used this n their computing unit) Conduct experiment outside where it is quiet. **Learn** When children have finished the experiment verbally go over results. 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 Pose the question – what will happen to the sound from their shaker as the distance from the sound source increases? Do they think the sound will get louder? Quieter or stay the same? How can we find out – test it	

Respond Children to go back outside and choosing one of their shakers, one child stay in one place and shake shakers, while others move back with the iPad/datalogger to see what happens when the distance from the sound source increases. In books children to record what they have found out – the further away from a sound source the quieter the sound is. Why do they think this is? It is because the vibrations spread out as the distance increases which makes the sound quieter – link to the water ripples from the tuning fork experiment.



Reflect Show the children a graph on the board. What do they think is happening at each stage? How do they know when the volume is louder? Bigger vibrations. Children could interpret the graph as in the hall. E.g. The first peak is assembly, second lunch and third PE in the afternoon.

Scientific enquiry – 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 FROGS seeking patterns
Type of scientist – I explain what I have found out using speaking and writing.

LO: To recognise that sounds get fainter as the distance from the sound source increases.
Christian Value: respect, friendship

Feedback:

Year 5
Living Things and their Habitats
Biology

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? (Could have a classroom spider plant) **Explore** https://explorify.uk/en/activities/odd-one-out/three-roots	Adolescent, adult, amphibian,

Children to display a detailed part of a plant (see resources) what are the female parts of the plant? – female = carpel = stigma, style and ovary. Male = stamen – anther and filament. How do these parts of the plant help with how plants reproduce? (They did this in year 3) On whiteboard draw life cycle of plant or how plant is pollinated and fertilised. What can they remember? 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. A bee visits a plant and the pollen from the anther rubs off onto it. The bee then visits another plant and the pollen rubs off onto the stigma (pollination) The pollen then travels down the style and into the ovary where a seed is made (fertilisation) The seeds are then dispersed by insects, wind, animals eating and then excreting them, humans planting or in water. **Learn**. What do we mean by reproduction? All living things need to make more of themselves so that their species does not die out. Reproduction is the process by which new living things are made. There are two types of reproduction: sexual and asexual. Sexual reproduction required two parents to make one offspring. Asexual reproduction requires only one parent which creates offspring that are an exact copy of the parent. We are going to learn about sexual reproduction in plants. Living things that use sexual reproduction have sex cells called gametes. These are split into male gametes and female gametes. In some living things, the male and female are separate, but in other living things one organism contains both male and female gametes. In plants, the male gametes are contained in the pollen and the female gametes are called ovules. Sexual reproduction happens when a male gamete and a female gamete join. This is called fertilisation. Sexual reproduction produces offspring that are similar to both parents, but not identical to either. Let's look at asexual reproduction in plants. How many parent plants are needed? One. The new plants will be identical to the parent plant. They are clones. Let's look at some plants that use asexual reproduction. Some plants develop bulbs or tubers underground. These bulbs or tubers will develop into new plants for the following year. The new plants will be genetically identical to the parent plant. Daffodils and potatoes are examples of plants that reproduce this way. Daffodil bulbs store energy underground. Once the daffodil plant has died back, the bulb develops side shoots that will grow into	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

new daffodils for next year. Potato plants grow tubers underground during the spring and summer. These tubers will grow into new plants the following spring if they are left undisturbed. Other plants produce side branches or runners with new plantlets on. The roots of each plantlet grow down into the soil, and the plantlets will grow to form new plants identical to the parent. Spider plants and strawberries are examples of plants that reproduce this way. Strawberry plants send out runners with small plantlets on. These will each grow into a new strawberry plant. Spider plants send out branches with baby plantlets on. Each plantlet will grow into a new plant. **Respond** Children to choose either Strawberry, Potato, Daffodil or Spider plant. Draw a plant of choice and then describe how they reproduce asexually, using words runners, tubers and bulbs. **Reflect** Look at statements about sexual and asexual reproduction – can they sort into sexual and asexual reproduction. Produces identical offspring. Offspring are similar to their parents but not identical. Requires two parents. Requires just one parent. Can you think of an example of something that reproduces this way – asexual (bacteria, plants inc strawberries, dandelions, blackberries) Children to respect the value of plants and how they keep us alive. Scientific enquiry – 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 FROGS grouping and classifying. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs LO: To describe the life process of reproduction in some plants and animals. Christian Value: respect	
2. What are the lifecycles of placental, monotreme and marsupial mammals? **Explore** https://explorify.uk/en/activities/odd-one-out/invaluable-animals What is a mammal? What features are special to mammals? Fur, warm blood, feed baby milk, give birth to live young, reproduce sexually **Learn** Identify that there are three types of mammals. To start with we are going to focus on placental. **Placentals:** their young grow inside the female's body and are born fully developed– link human timeline. What other mammals are placental mammals? – dog, elephant bat etc. What kind of mammal is a	

rabbit? - a placental. Look at the lifecycle of a rabbit - placentals- it is a cycle so it always go in a circle. Can you highlight key words / phrases for each stage of the rabbit life cycle on IWB Embryo - inside mothers tummy Baby - drinks milk - Young - grows and develops Adult - reproduce sexually Go over that this is the same for any other placental mammal. Model a dog life cycle. **Respond** In books children to choose (e.g. Cat dog horse cow rabbit) and create a placental mammal lifecycle and label the 4 stages and key words. Then introduce the table comparing lifecycles and fill in and date the mammals section leave others for other points during the year. **Learn** There are two other type of mammals. Does anyone know what they are? Marsupials and monotremes. What makes them special what features do they have? What animals are in these groups? **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 **Respond** If time children can to draw a lifecycle of a marsupial and/or monotreme. **Reflect** True or false. A kangaroo is a monotreme mammal. A duckbill platypus lays eggs so it is not a mammal. A placental mammal is born not fully developed and grows in a pouch. Scientific enquiry - To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS grouping and classifying. Type of scientist - I can use relevant scientific language and illustrations. LO: To describe the differences in the life cycles of mammals. Christian Value: Perseverance	
3. What is the lifecycle of a bird? **Explore** https://explorify.uk/en/activities/odd-one-out/feathered-friends https://www.bbc.co.uk/bitesize/clips/zp62tfr - lifecycle clip how many lifecycles can the spot? Quick	

draw – on whiteboards draw the life cycle of a mammal. Which type of mammal have they chosen to draw? Are they correct? **Learn** What features can you remember about birds? Feathers, wings (not fly because not all birds fly) claws, beak, lay eggs. One of these link to the life cycle of a bird. Which? – lay eggs. Go through what an egg is. All species of birds lay eggs. If the eggs are fertilised they will contain the bird embryo which will develop inside the egg until it is ready to hatch. The chicken eggs that people eat and not fertilised they do not contain baby chickens however we can explore chickens eggs to find out more about them. What parts of an egg can you name? Go through that the albumen is made of water and protein it cushions the yolk and provides nutrition for a developing embryo. The yolk contains proteins and fats that provide a main source of nutrition for the embryo. The shell protects the inside of the eggs. It contains thousands of small holes to allow air to move through the shell. The egg is a key stage in their life cycle. On the board display the different stages and ask the children to put in the correct order. The life cycle of a bird starts with a fertilised egg is laid by the female. The egg hatches in the adults provide food for the chick. The chick grows and develops. The young bird leaves the nest and continues to grow into an adult. The adults mate and reproduce. Remind the children that we draw a life cycle in the shape of a circle because it never stops. Go through the different stages of the life cycle of a bird. **Respond** in books children to draw the life cycle of a bird. Then label the different stages an annotate what happens at each of the stage. For example birds lay eggs and humans give birth to live young. Children to then conduct their own research by using DK find out https://www.dkfindout.com/uk/animals-and-nature/birds/how-birds-grow-up/ to complete the thinking frame on the life cycle of a bird. See resource is for thinking frame. **Reflect** How are the life cycles between humans and birds different? Give me two similarities and two difference.. . Children to be thankful for the amazing world we live in. Scientific enquiry – To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS research. Type of scientist – I can use relevant scientific language and illustrations. LO: To describe the differences in the life cycles of a bird Christian Value: thankfulness	

4. What is metamorphosis?

Explore https://explorify.uk/en/activities/odd-one-out/meadow-feast

Cut out lifecycles of dog and bird frog and butterfly (see resources) recap their lifecycle. Put them in order. From looking at them what is the same and what is different about them – write these ideas on IWB Compare them all what is different about them what is the same.

Learn Focus upon butterfly and frog. What do you notice about the lifecycles – how they look at beginning and end of lifecycles? Is it the same like a dog? No it goes through a massive change – what is this called? – Metamorphosis

We are going to focus today on animals which experience metamorphosis in their lifecycle.

Does anyone know of a different animal apart from the butterfly that experiences metamorphosis?

Frog/ newt/ dragonfly. Go over butterfly is an insect as well as dragon fly. Frog and newt is an amphibian

Respond Sheets on A3 paper Give children differentiated sheets (see resources) in tables of 4's ABILITY we will do this like a guided reading race. The table will work together to find the missing answers. The clue cards will all be at the front. The groups will pick a fact they want to find out and then send one person to find it on the clue cards – they then take the answer back to the group and then a different Ch comes to find another answer. (Clue cards in resources box in PPA room. Questions in resources.)

Discuss the language involved with lifecycles and go over what they have found out about the lifecycles

Fill in the table we have in books from previously in year on lifecycles and they can fill it in for insect and amphibian

Task – think of an animal lifecycle which involves metamorphosis they will prob pick butterfly/ newt/ frog or dragon fly. Children to draw a lifecycle in their books

- Haps to label and give facts for each stage and do an amphibian and insect
- Maps to label the stages and key words
- Laps to label choose insect or amphibian

CHALLENGE Can they give 2 similarities and a difference of an insect and amphibian lifecycle? **Reflect** What are the similarities and differences between an insect and amphibian lifecycle? - both lay eggs, both go through metamorphosis. Differences = amphibians develop in water Make some comparisons between animals. How long does a human carry a baby for? Quiz - What are the gestation periods for these mammals? (See smart in resources) Children to be thankful for the amazing world we live in. Scientific enquiry - 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 FROGS observation over time. Type of scientist - I can report and present findings using speaking and writing including displays and presentations. LO: To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Christian Value: thankfulness	
1. What are differences ad similarities between life cycles of a mammal, an amphibian, an insect and a bird? Odd one out - show pictures of a frog, ladybird, blackbird and elephant. 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. Scientific enquiry - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	

Type of scientist – I can report and present findings using speaking and writing including displays and presentations. LO: To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Christian Value: thankfulness	
Feedback:	

Year 5 Animals including Humans Biology	
Knowledge to be taught: • To describe the changes as humans, develop to old age. Changes as humans develop are also covered in RSE in puberty.	
Lesson Guide	**Key Vocabulary**
1. What is the human timeline? **Explore** PMI – what if the average lifespan of a human was 200 years old? Add these questions on the board to expand discussion. What are some of the changes as humans develop to old age? What further changes might occur if humans lived to the age of 200? What impact would a rising population have on the environment? **Learn** What is the human lifecycle? Talk pair and share. We are scientists and that means we are going to learn some new vocabulary to identify the different stages in human growth. Highlight that we can study human growth in lots of ways Physical emotional social and psychological. In science we focus on the stages of human growth and development physically. We're going to learn the different stages of where the major changes take place. (PowerPoint has all this information, see resources) The first stage of the human life cycle is prenatal. This means before birth and is the stage of development from the time of fertilisation where the male and female sex cells fuse together to the time	Adolescent, adult, asexual reproduction, baby, birth, death, egg, elderly, embryo, fertilisation, gestation, growth, life cycle, live young, mammal, ovary, puberty, reproduction, sexual reproduction,

of birth. Show the children how the baby develops from fertilisation to a 39 week old baby in the womb. See resource is for PowerPoint. The next stage is infancy. This is a stage of development from birth to two years old and includes babies and toddlers. The rate of physical development is fast at this stage. Infants are totally dependent on others for food and care. Ask the children what the main changes are in this stage. For example crawling rolling over walking cutting teeth. Third stage is childhood and takes place between the ages of three and 10. Physical growth is more steady and children available to feed themselves and can increasingly take care of important physical needs. Highlight to the children that this stage takes place through primary school. Ask the children what they think the next stage is called. They will probably say teenage however highlight to the children that the scientific name for this stage is adolescence. This stage of development last from the age of 11 to 19 and during this stage puberty results in changes in the body. These changes occur to enable production during adult hood. Tell the children that adulthood is split into three sections early adulthood, middle adult hood and late adult hood. Early adulthood is the stage of development from the age of 1839. The human body is the peak fitness and strength. And there is still some growth but not of height this is the age that most humans reproduce. Middle adulthood takes place between the age of 40 and 59. Both male and female ability to reproduce declines with age. Women experience menopause in their 40s or 50s when they no longer produce eggs. Physical changes can include loss of hair among men and greying for both men and women. Late adulthood is the last stage of human development takes place after the age of 60. There's no physical growth although mental development is possible. The body declines in fitness and health and people become more fragile physically. This can sometimes result in increasing dependency on others to care for them. The end of the human life cycle is when a human dies post up **Respond** Children to turn their books and draw a line down the middle of the page (page to be horizontal) this will be their timeline. Use the pictures in the resources, children to put the stages of the human lifecycle on order on their timeline.	teenager, toddler, vertebrates

Must include the heading of the stage. Extension - children to describe a few milestones that occur at stage. **Reflect** What new vocabulary have you learnt this lesson? Did we identify all the human growth and development? Which new ones have you learned about in this lesson? Children to respect the importance of life. Scientific enquiry - To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS grouping and classifying. Type of scientist - I can report and present findings using speaking and writing including displays and presentations. 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? **Explore** https://explorify.uk/en/activities/what-if/all-humans-looked-the-same Recap what the stages of humans are and the changes they go through. Fertilisation - prenatal - childhood - adolescence - early adulthood - middle adulthood - late adulthood. What key things happens at each stage? E.g. adolescence got through puberty, early adulthood likely to reproduce, middle adulthood go through the menopause. **Learn** What is information? What is the difference between information and data? Children discuss with talk partners and feed back to the class. Data is facts and figures, Information is when the data (facts and figures) have been presented/ interpreted/ organised or structured to make it meaningful. Show a table with information about the growth of babies (height) (See power point in resources). What does this data show us? What are the categories? What is the unit of measurement? If this information was presented in a graph, what should be shown on the x/y axis? Why? What kinds of graph should be used to present this data? Why? On the board display different types of graphs, their names and their features. Give children sheet with pics of graphs on and info children in pairs to match and sort which graph matches to which piece of information to describe the graph - the answers are on the power point	

Encourage children to ask questions about aspects of using the graph they don't understand – e.g. why are line graphs better to use for data over time? Show a line graph and a bar graph representing the data for the growth in height of babies. Which graph should the data be presented with? Why? Why do scientists want to present their data clearly? What are the problems if they don't? Which do they find the easiest one to see the data in? We are going to create graphs (bar) using the table with the boys and girls baby heights on (see resources). Firstly we are going to do a bar graph to begin with focussing on boys height. **Respond** Model to the children how to create the axis and start off creating a bar graph on squared paper. Children to then complete bar graph on the height of boys. LAPS will have a pre drawn with numbers already on they will need to add titles and draw it Extension for HAPS – tell the children how drawing a line graph is slightly different. – numbers on the line. Ask the HAPs and possibly MAPS to create a line graph of the height of girls. Extension for MAPS and LAPs use DK find out https://www.dkfindout.com/uk/human-body/life-cycle/ to research and complete thinking frame on human life cycle (see resources) **Reflect** On the board display a completed line graph and bar graph showing height of babies growth. Which do you find easier to read? Why? Why might scientists use these graphs to display their results? Children to respect the importance of life. Scientific enquiry – To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS seeking patterns. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. LO: To describe the changes as humans, develop to old age Christian Value: respect,	
Feedback:	

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	Key Vocabulary
1. What are the properties of materials? (Opportunity for outdoor learning – material hunt) https://explorify.uk/en/activities/what-if/all-materials-were-transparent **learn** Use the materials box from the science cupboards. Put a selection of materials on each table. Ask the children to nook at the materials on their tables… list words to describe them. Revise term "properties" Properties is a word used to describe a material (the characteristics that enable us to differentiate one material from another) e.g. rigid, opaque, transparent, translucent, flexible permeable, impermeable, durable etc. Using a gift bag (feely bag) with a material in it, children to describe the material to their partner, without looking, using property words discussed. **Respond** On tables put strips of paper with property materials on them – rigid, permeable transparent translucent opaque high density low density electrical conductor magnetic insulator flexible durable absorbent soluble Spread them out on tables and put a sheet of A3 paper in the middle of the table. Can the children brainstorm what the words mean.?	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,

Learn Which words were you unsure of? To help you next time ask the children to focus on the words they do not know or aren't 100% sure with. E.g. not soft as too easy, **Respond** Write 3- 5 in their book that they do not know or are unsure of and use a dictionary to write the word and it's meaning in their books. e.g.- rigid – unable to bend or be forced out of shape. Challenge can they give an example of a material with that property **Reflect** – In threes, provide them with an object, e.g. wood, fabric, paper, property that they Choose an object e.g. shed, wellies, tea towel, cushion, window etc and ask them to create a paper chain of properties of the object. On each chain they write a different property. How long can they make their paper chain? E.g. wellies – durable, water proof, impermeable, opaque, flexible Children to be thankful to the many scientists who developed or discovered these materials. Scientific enquiry – 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. FROGS grouping and classifying Type of scientist – I ask different kinds of questions. LO: To identify and describe properties of materials. Christian Value: thankfulness	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 is the property of a material important? (Opportunity for outdoor learning – look at objects and why they have been built of a certain material. E.g. shed roof felt so it is waterproof/impermeable and durable, car windscreen glass so you can see through it etc.) **Explore** Big question – What if an umbrella was made of glass? Recap definitions of properties. In pairs – read definition from books from week 1 Can you guess the properties? **Learn** Why is it useful to know the property of a material? Why do scientists test materials? You can then choose the best material for a purpose. Watch video https://www.schoolsofkingedwardvi.co.uk/ks2-science-year-5-3c-materials-grouping-materials/ We are going to test materials to find out their properties focussing upon magnetism, flexibility, permeability, rigidity and transparency	

What do these words mean? -

- **flexibility** - bending easily without breaking
- **rigidity** - unable to bend or be forced out of shape
- **transparency** - see through - lets all the light through
- **permeability** - allows water to pass through
- **magnetism** - attracts to a magnet

How can we do this? What are the children's ideas?

- flexibility gently bend it
- rigidity can you force if out of shape
- transparency can you see through it
- permeability can water go through it
- magnetism will it attract to a magnet

Respond Draw a table in books - 6 columns and 6 rows with each row being 3 lines.

In pairs pick 5 materials

Each table will need

- Magnets
- Syringes
- Beaker of water
- Paper towels/ tray/ jugs/ larger bowls

We will save the permeability till the end.

Record their results in the table by ranking the materials 1 - 5 e.g. 1 being the most flexible / rigid, or yes and no magnetism, permeability and transparency.

What would they now like to find out from the experiment they have just done. e.g. checking other materials for same properties/ checking for different properties etc...This links to the ! part of our PEEL! Conclusion writing (They have not done this before. It is a y5 and y6 objective)

Reflect Watch https://www.bbc.co.uk/bitesize/topics/zrqyycdm/articles/zk2d96f and then complete quiz at the bottom of the page? What materials would be good to make a shed? Why? Why would paper

not be a good choice? What about a tea towel? Children to show the Christian values of friendship and respect as they work together to conduct their experiment.
Scientific enquiry – To use test results to make predictions to set up further comparative and fair tests FROGS grouping and classifying.
Type of scientist – I can set up fair tests when necessary.

LO: 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?
Explore https://explorify.uk/en/activities/odd-one-out/tiny-grains
Learn Recap on what is a solid and a liquid. Look at class clips.
https://www.bbc.co.uk/bitesize/topics/z6p6qp3/articles/zsgwwxs as a recap. The properties of solids include:

- Solids stay in one place and can be held.
- Solids keep their shape. They do not flow like liquids.
- Solids always take up the same amount of space. They do not spread out like gases.
- Solids can be cut or shaped.
- Even though they can be poured, sugar, salt and flour are all solids. Each particle of salt, for example, keeps the **same shape** and volume.

Liquids
The properties of liquids include:

- Liquids **can flow** or be poured easily. They are not easy to hold.
- Liquids change their shape depending on the container they are in.
- Even when liquids change their shape, they always take up the same amount of space. Their volume stays the same.

Gases
The properties of gases include:

- Gases are often invisible.

- Gases do not have a fixed shape. They spread out and **change their shape** and volume to fill up whatever container they are in.
- Gases can be squashed.

What do we mean by the word separating? When some materials are mixed together, it is possible to separate the mixture and get the original materials back again.

Set the scene - Disaster! Solids have been mixed up!

In ability Pairs, place mixtures of solids (differentiated) and variety of equipment (spoons, magnets, small holed sieves, large holed sieves, beakers, paper bowls for materials to be separated into) on tables.

Laps/SEN Sand Gravel marbles and paper clips

Maps Sand Gravel marble paper clips non magnetic coins

Haps sand rice marbles paper clips non magnetic coins

How can we separate the solids? Which equipment could we select? Encourage table groups to discuss.

Respond - children to separate the materials. Once separated , does it matter which order you separate them in? Put all the materials back in the original bowl and ask them to separate again but in a different order. Was it easier? Harder? Have you changed the equipment you have used?

Learn What was different about those materials that helped us to separate them? They had different properties. Paperclips are magnetic. Sand has small particles so they could fit through the sieve. Marbles are a large solid so can be picked up by the spoon. Rice are larder so get caught in the sieve. Show on the board how you could explain the separation by diagram using a flow chart.

Respond - All groups to draw a flow chart describing how they separated the solids.

Extension:

For each mixture children record in diagrams and by writing how they separated the solids.

Can we get the original solids back?

Children will need to explain

- what you are using
- why you have used that equipment
- why it doesn't separate the other solids

E.g. Firstly, I used the magnet to separate the paper clips from all the other solids. We used the magnet because it is the only equipment that will separate the magnetic solid. The sand, marbles and gravel are not magnetic so therefore will not be separated with a magnet.

Reflect - https://explorify.uk/en/activities/problem-solvers/clean-up-the-beach

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

Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS seeking patterns.

Type of scientist - I ask different kinds of questions.

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

Christian Value: respect, friendship

4. How could we separate solids using filtration?

Explore Odd one out - sand, rice, sugar

What can you remember about solids liquids and gases. Tell your partner.

Can you change a solid into a liquid? Or a liquid into a gas? Etc.... Can they remember the words condensation/ evaporation/ freezing etc....

Learn What is a mixture? 2 or more materials mixed together, which can be separated. What could we use to separate solids - remind children about using a sieve. Look back in books if needed.

What happens when we mix salt/ sugar in water? In pairs, give the children a beaker and a spoon of either salt or sugar and try it. It dissolves in liquid ..... the science word is ... soluble.

What about sand and water... what is your prediction??? Do it.....

It does not dissolve in liquid- Insoluble

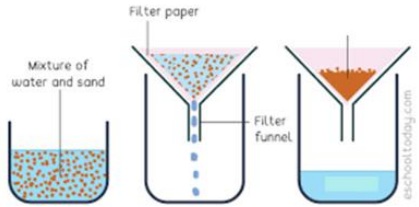
Go over what soluble (dissolves in a liquid) and insoluble (it does not dissolve in a liquid)means - can they give anymore examples of both? E.g. coffee sugar gravy wood duck mud pebbles.

Today we are going to look at insoluble solids in liquid - in particular sand.

How are we going to separate sand and water? What equipment have we used that would work? - sieve maybe? We are going to show you a new way to separate an insoluble solid and water - filtration There is special filter paper that has extremely tiny holes in so small we struggle to see them

Respond Children to have a go at filtering sand and water see what happens.

Children to then in books to draw and label what they have just done using filter paper e.g. see picture.



Reflect Children to then answer the questions - can some dissolve in water? What is this called? Why did we need to use filtration to separate 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 - To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs. FROGS grouping and classifying. Type of scientist - I can use relevant scientific language and illustrations.

LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated through filtration.

Christian Value: respect, friendship

5. Who can make the cleanest water?

Explore https://explorify.uk/en/activities/what-if/an-astronaut-gets-thirsty Discuss prompt for thinking on water cycle.

Show then picture – what words can use to describe it.

Show scene of peoples thoughts – what do the children think? Do you agree with any?

Where do we use water? Watch video https://www.youtube.com/watch?v=BCHhwxvQqxg

What can contaminate water? How can we make it safe – build a filter. Your challenge today is to make the cleanest water. Give the children a range of equipment funnels, filter paper, beakers, sand, stones, sieves, spoons?

Respond Children in groups of 3/4 to try and create the cleanest water.

Take photographs as they go, to help with recording later. We will then see who has made the cleanest water and judge – why do we think this group has made the cleanest water.

Children to upload photographs on seesaw of their clean water and annotate with what they did in the correct order.

Laps – voice record

Maps noted own

Haps have an extra question – would you drink this water why/why not?

Reflect Is this water now completely safe to drink? Why not? – may contain bacteria – how do we get rid of it? Special water filter systems or sometimes special tabs are used in water that may be contaminated and this gets rid of the harmful bacteria in it.

Watch https://www.bbc.co.uk/teach/class-clips-video/science-ks1ks2-what-happens-to-our-sewage/zrmhy9q to see how our water is cleaned so it is safe for us to drink.

Children to show the Christian values of thankfulness and respect as they recognise that they have clean water to drink, unlike other parts of the world.
Scientific enquiry – To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. FROGS research
Type of scientist – I ask different kinds of questions.

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. Can you retrieve a soluble solid from a solution? (Part 1)

Explore https://explorify.uk/en/activities/odd-one-out/delicious-drinks

Last year we looked at reversible changes. What does this mean? Can you think of examples? Water-ice-steam. How does ice turned to water? How does water turn to steam? How does water turn back into ice and how does steam turn back into water. Make sure the children use the words melting heating freezing evaporation and condensation.

What do the words soluble/insoluble mean? Insoluble it doesn't dissolve in a liquid. Soluble – it does dissolve in a liquid. What examples can you give – gravy, coffee, sugar etc.

Learn In our filtration lesson you dissolved sugar/salt in water. What happened? Give the children this (disappearing act). Who is correct? Then girl with the glasses.

The sugar has dissolved. Can we get the sugar back? Pose the question Can you retrieve a soluble solid from a solution? What do we mean by a soluble solid – something that dissolves in a liquid. What is our soluble solid – sugar. What is the solution? – the sugar and water combined makes a solution. So what does our question mean? Can we get the sugar back from the water and sugar when dissolved?

We are going to have to get rid of the water. How can we do that? – evaporation. So how can we do this experiment? Any ideas? Go over how we will do this. Put it a petri dish and leave for a week and see what happens.

Respond – TASK – plan experiment in pairs

Question Can you retrieve a soluble solid from a solution?

Equipment

Method

Prediction. What vocabulary scientific vocabulary should we include? Set up experiment. Results table to be drawn next week in books. **Reflect** – jot down three things you need to remember to help you next time Scientific enquiry – To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS observation over time. Type of scientist – I plan different types of scientific enquiries to answer questions. • LO: To demonstrate that dissolving, mixing and changes of state are reversible changes. Christian Value: respect, friendship	
How can you separate a soluble solid from a solution? **Explore** https://explorify.uk/en/activities/odd-one-out/hot-drinks-for-cold-days Vocab recap – soluble, insoluble, solution, dissolve. **Learn** Watch clip of separating soluble solids from liquids https://www.bbc.co.uk/bitesize/topics/zryycdm/articles/zsqfp4j What is your experiment? – Can your re44trive a soluble solid from a solution? What does this question mean? Get your petri dish. What can you see? What has happened? Where has the water gone? What state of matte4r has your water changed to? A liquid to a gas leaving the sugar behind. **Respond** Write results heading in books. Children to draw what their petri dish looked like last week. E.g. petri dish with water and sugar labelled. Now ask the children to collect their petri dish and draw and label what it looks like now after the week has passed. What has happened to our soluble salt solution? Children to discuss with their partner and then write a PEEL! Conclusion in their books. Example I found out you can get the soluble solid back from a solution. I know this because the water has evaporated As you can see from my results the salt is still in the dish. My prediction was ……	

So therefore if you wanted your soluble solid back you can get it through evaporation

Next time I would like to investigate other soluble solids or does the temperature of the water affect whether we can get the soluble solid back? Location?

Reflect - Discuss dissolving stuff concept cartoon.

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

Scientific enquiry - 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 FROGS observation over time.

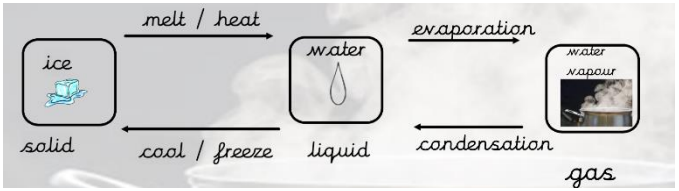
Type of scientist - I can report and present findings using speaking and writing including displays and presentations.

- LO: 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

8. What is an irreversible change?

Explore https://explorify.uk/en/activities/what-if/water-couldnt-freeze On the board display. What does this show us - a reversible change. Why is it reversible?



Learn

Go through power point (see resources) which shows how eggs change when heated due to a irreversible chemical change. Highlight that an irreversible change mean you cannot get it back. Identify that a chemical change involves reactants and products. Reactants are the materials you start with before the chemical change happens and the product are the materials formed in the chemical change.

What happens when you add heat to ice- bread and potatoes - Which ones are reversible/ irreversible why - (chemical reactions) What are the reactants? What are the products? E,g, potatoes - roast potatoes / mash / chips/crisps etc

What kind of reaction is this? https://www.youtube.com/watch?v=QVwyXjLjr98 - burning

Respond If can go outside to the garden and around the fire pit (must be with Alice and she is trained) If not We can have a go at lighting matches splints -MUST REMEMBER TO TAKE WATER OUTSIDE AND DISPOSE OF MATCH AND KEEP SAFE DISTANCE BETWEEN CHILDREN HEALTH AND SAFTEY (use fire pit if can and all children to be outside and watching)

Children to see if they can tell a chemical reaction has happened by using their senses - what can they smell/ see/ feel etc..... Can the reflect whilst they are looking at the match/ wood burn

Learn Another name for burning is combustion. Go through features of combustion - needs oxygen, makes carbon dioxide, often makes water vapour, makes a flame, creates smoke and ash, gives out heat. Recap that in a irreversible reaction, a new product t is formed, this can be a gas, new solid or liquid. A gas formed in a liquid is easy to see because it forms bubbles, and a temperature change occurs.

Respond - in books get children to write a short paragraph explaining what an irreversible reaction and include what they have learnt during the session.

Reflect Get children to discuss question When you heat a material it is always an irreversible reaction - explain.

Children to show the Christian values of respect as they work safely to create combustion

Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS fair testing.
Type of scientist - I can report and present findings using speaking and writing including displays and presentations.

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.
Christian Value: respect, friendship

Does the amount of bicarbonate of soda affect the amount of gas produced? (Opportunity for outdoor learning - conduct experiment outside)

Explore On the board display a slice of toast, match, ice cube and salt. Name two similarities and two differences. This will recap the vocabulary reversible and irreversible for the children. They

should identify that salt is a reversible change and can be returned by evaporation. The ice cube can be frozen. The toast and match are irreversible. The match is combustion etc. Learn – Show the children the experiment they will conduct. Pour 20 ml of vinegar into a test tube and put 1 tsp of bicarb into balloon and pop the balloon on top of the test tube so it is sealed around the edge of the test tube and tip in the bicarb. And watch what happens. What kind of reaction is this? Irreversible. It is a chemical reaction. What were the reactants – vinegar and bicarb. What is the product – bubbles are made a gas is created as the balloon inflates. pose the question What combination of bicarbonate of Soda and vinegar will produce the most gas? Tell the children that they will be in threes. How can you answer this? – Have 3 test tubes each with same amount of vinegar in and will add different amounts of bicarb into balloons using a funnel we will then put the balloons on top of the test tube and pour the bicarb from balloon into test tube at the same time and see which produces the most carbon dioxide. What will you need to change? – either amount of vinegar or amount of bicarbonate of soda How many variables can you change? (1) In their threes they need to pick either changing the amount of bicarb or the amount of vinegar. The amount of the other must stay the same in all of the experiments. **Respond** Children to write their plan in the books including – question, equipment, method (they can draw – see smart in resources) fair test and prediction. **Learn** As it is tricky to get the balloons onto the test tubes, the children will practice how to get the balloon onto the test tube. Give each child a balloon and test tube. If they are changing the quantity of vinegar, then they need the bigger test tube. Show the children how to attach the balloon. How will we record the results? You will need three columns and four rows. The column headings will be amount of vinegar, amount of bicarb and observations. Children to draw tables in their books. **Respond** Carryout experiment making sure each group knows which balloon has what combination. Do this outside.	

Fill in results table – What did they find out. Children to write a PEE conclusion – We found out that the test tube with the most amount of bicarb produced the most gas. This happened because the balloon inflated the most. My prediction was correct/incorrect because... **Reflect** One thing I will remember from today is... Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry – To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS fair testing. Type of scientist – I plan different types of scientific enquiries to answer questions. 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 the action of acid on bicarbonate of soda Christian Value: respect, friendship	
Feedback:	

Year 5 Earth and Space Physics	
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. What shape are the Earth, sun and moon? **Explore** https://explorify.uk/en/activities/odd-one-out/celestial-objects	Dwarf planet, axis, block,

Learn Introduce the children to the Earth by showing them some facts. The Earth is the only known planet in our solar system with liquid water on its surface. Over ¾ of our planet is covered in water. Ask the children what shape is the Earth? Debate between 2 sides. How do we know? Identify that throughout history some scientists have thought the Earth was flat. But some have thought it was spherical – even before there were space craft. What shape does the land around us appear to be? Does this then mean the Earth is flat? On a flat surface if someone walks away from you what happens? (Get smaller) Go and find out on field working in pairs. Walk away on flat land, what happens? Repeat exercise on bank on field outside. (Feet disappear first, head reappears first.) Introduce the word sphere. Back in the classroom reinforce this using a globe and a Lego man. As the Earth moves their person down their feet disappear first etc... Read the shape of the earth evidence cards (see in resources on smart) and see the different points of view – discuss – what do you think – who is right? What happen to boats out to sea? What does this tell us about the shape of the earth? Aristotle noticed this, which went against common belief. Discuss other early evidence for round earth – stars – if the Earth was flat, we would see the same constellations wherever we were. Eclipses – you can see the curved shape of the Earth on the moon. Why are they spherical? Watch https://www.youtube.com/watch?v=0OeJSzpISGE up to 1min28. Watch BBC science clip https://www.bbc.co.uk/bitesize/clips/z9r634j to consolidate learning and to help the children with recording that the Earth is spherical. **Respond** Children to draw/ write what evidence shows us to prove the world is spherical (key word!) there are some examples (in resources) for children to use if they need. SEN to verbalise and show their understanding using the ball people. Explain the pictures – upload onto science folder in seesaw. **Reflect** What about the sun? Flat or spherical? What about the moon? How do we know they are also spherical? Why are they spherical? They are large enough that gravity is making them spherical. Link to video. Children to show respect to the scientists that persevered to make the discovery and prove evidence that the earth is spherical.	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 system, sphere/spherical, south, spin, sun, sunrise, time zones, Uranus, Venus, west

Scientific enquiry – To identify scientific evidence that has been used to support or refute ideas or arguments. FROGS research Type of scientist – I can use relevant scientific language and illustrations. LO: To describe the Sun, Earth and Moon as approximately spherical bodies Christian Value: Perseverance, respect	
2. What are the planets in our solar system and how do they move in relation to the sun? **Explore** https://explorify.uk/en/activities/what-if/there-were-two-suns What shape is the Earth? How do we know? What about the sun and moon? Refer to last space lesson. **Learn** What do they already know about planets Can you name the planets? Can you name the order of the planets? Where did you get your ideas from? Watch https://www.schoolsofkingedwardvi.co.uk/ks2-science-year-5-4-earth-space-solar-system/ a song about all the planets. Go over the names of the planets and the order. Use the mnemonic – my very excited monkey just sits under noses to help them remember the correct order. Are all the planets the same size? No they are not. We're going to learn the sizes of the planet using fruit and peppercorns to help us. Due to cost, we are using pictures. Give the children a picture of fruits (see resources) – peppercorn, apple, two cherry tomatoes, an orange watermelon, blueberry and grapefruit. Can they cut out the fruits and order them in correct order of the planets to show the size difference. See who was right. The peppercorn is mercury, Venus and Earth are cherry tomatoes, Mars is a blueberry, Jupiter is a watermelon. Saturn is a grapefruit, Uranus is an apple and Neptune is an orange. Which planet is the largest? Which is the smallest? Which two planets are of a similar size? Respond In books and using a double page Children to draw the solar system Label the planets and make sure their size is linked. SEN to have pictures of the planets to stick in if they choose. **Learn** Question – what does orbit mean? A curved path of ab object that goes around a star, planet or moon. What do our planets orbit? Can you in pairs show me someone being the sun and one being the earth swap over? Who should be moving? Why? Watch https://www.youtube.com/watch?v=z8aBZZnv6y8 this video is a bit slow, but you can really see the orbit of the sun (don't need to watch it all but can have it on while asking the questions below) What does this show? What does it tell us about the	

planets close to the sun and the planets further away? Close planets go around much quicker. Further planets take a lot longer. Mercury goes around the sun 4 times to the Earth's one so for every one year on Earth you would spend 4 on mercury. How old would they be now if they lived on mercury? https://www.youtube.com/watch?v=UzbnPX8Stnc watch this it is long (8:30 mins) but fascinating to get the to see space and sizes, rotations etc... It flies through space after 3mins so if you don't want to watch that bit you can stop at 3 mins ish. No speaking so you may have to read it as it goes along. How do the sizes of the Earth, moon and sun compare? Let's imagine using a tennis ball, marble and yoga ball. Which represents what? The marble is the moon, the Earth is four times bigger than the Earth and is the tennis ball, the sun is the yoga ball and is 400 times bigger. **Respond** Children to draw a table in their books with three columns. Put headings in the table – planet, number of days to orbit the sun and what they planet is made of. Children to use google to research and find the information. Can work in pairs. We aren't doing rows because the children can draw a line under each planet they do so they have the space they need not cramming it in. Laps – 5 planet, Maps all, Haps all with extra fact. **Reflect** – What have you found out? Which planet takes the longest to orbit the sun? Why? Are any of the planets made up of the same thing? 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 FROGS research. Type of scientist – I can report and present findings using speaking and writing including displays and presentations. 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? (Opportunity for outdoor learning – drama outside) **Explore** BIT Why don't Australians fall off? What is the shape of the Earth. What are the planets in our solar system? Can you say them in the correct order?	

Learn What does the word orbit mean? – to move in a regular, repeating curved path around an object. Tell the children that the Earth orbits the sun. What can you tell me about that statement? What do they already know? Look at the video https://www.youtube.com/watch?v=z8aBZZnv6y8 for support. Ask the children to get into pairs.; One is the Earth and one is the sun. Show me how the Earth orbits the sun. (Just orbit not rotate)

Tell the children that the Earth days 365 and ¼ day to orbit the sun. What else is the Earth doing whilst it is orbiting? The Earth rotates. What does this mean? – the Earth spins as it rotates and it take 24 hours to do one rotation.

Respond In threes complete a drama activity to show how the Earth orbits the sun. One sun, one Earth and one cameraman to record for Seesaw. Check – are the children who are the Earth rotating as they are orbiting the sun? Could use the children or equipment in front of them. E.g. water bottles, glue sticks.

Learn What about the moon? The moon orbits the Earth while the Earth is rotating and orbiting the sun. The moon does not rotate. It takes about 27 days for the moon to orbit the Earth.

Respond Drama activity – join with another pair. In fours the children will be split into different roles. – a moon, a sun, an Earth and a cameraman. In their groups children to act out how the Earth and moon orbit the sun. Upload to seesaw.

Independently children make a model using a paper plate, circle and small circle with a split pin to demonstrate the orbits and size differences of the moon, Earth and sun. On a separate activity on Seesaw, children to explain the movement of the Earth, sun and moon.

Reflect The moon orbits the sun. True or false? Watch https://www.bbc.co.uk/programmes/p011867y Will Mercury take a longer or shorter time to orbit the Sun than Earth? Why? What about Neptune? Children to show respect to the scientists that persevered to make the discovery and prove evidence of the Earth's movements.

Scientific enquiry – To identify scientific evidence that has been used to support or refute ideas or arguments FROGS research.

Type of scientist - I can report and present findings using speaking and writing including displays and presentations.

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

Christian Value: Perseverance, respect,

4. Why do we get day and night?

Explore https://explorify.uk/en/activities/what-if/the-sun-rotated-and-the-earth-didnt What can they remember about space - pictures/ diagrams of previous learning on the board for children to talk about - look at KO. Recap what Aristotle found out world is spherical) What else have they found out about the moon, sun and earth? Share. Explain scientists found out that the Earth spins and the Sun keeps still

Learn Show children video of sun moving across the sky https://www.youtube.com/watch?v=29mh3flRqUU what is happening to the sun? Could we use the sun to tell the time? 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 everyday

Respond Using a torch, pick an object (tallish) and place it on a large piece of paper. Pretend the torch is the sunshine and move it across the sky and see what happens to the shadow. Draw around the shadows with the sun being at 9am/12 noon and 3pm this will help them see what shadows are like outside during the day

Learn Watch this video https://www.bbc.co.uk/bitesize/topics/zkbbkqt/articles/zn34r2p Watch both videos on this website. So how do we get day and night. It is daytime when the Earth faces the sun and nighttime when it is facing away from the sun.

Respond Children to complete the rotating earth instruction sheet so they can try to understand the earth rotating. Display a sun on the whiteboard which they will use to do this. Can they answer the questions on the sheet? Feedback..

Warning! Do not look directly at theSun!

Task 1	Task 2	Task 3	Task 4	Task 5
You are going to pretend to be the Earth. Begin with your back to the picture of the sun on the board. Can you see the Sun? Does that mean it is night or day?	Slowly rotate, anti-clockwise, until you can see the first part of the Sun. This is like a sunrise. How much of the Sun can you see? Where can you see it?	Carry on rotating until you are facing the picture of the sun on the board. Does this mean that it is night or day?	Keep rotating until you can only see the last part of the Sun. This is like a sunset. How much of the Sun can you see? Where can you see it?	Repeat Tasks 1 - 4 again then answer the following questions Did the Sun move? Can you explain what is happening? If you have time record what you see. Play it back. What happens?

In books draw a diagram and explain how we get day and night. Children to use the words orbit, rotate, sun, day night and Earth in their explanation. **Reflect** It is e.g. 2 o'clock now. Is it the same time everywhere in the world? Why not? The time differs depending o the position of the Earth. Have a look at the times of the word and how they differ. https://www.timeanddate.com/time/map/ 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 FROGS research. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. 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	**Key Vocabulary**
1. How can we measure gravity?	

Explore https://explorify.uk/en/activities/what-if/there-was-no-gravity

What is a force? – push pull or twist (taught y3) Ho can a force affect an object – they can change speed, shape, size or direction. (y3)

Learn Even when an object is stationary, there are forces acting on it. What force is pully us towards the earth? Gravity is a pulling force exerted by the Earth. The gravitational force pull in the direction towards the centre of the Earth. Why don't we get pulled into the centre of the Earth? There is an opposing force pushing us back. This force is exerted by the ground and is called reaction force. These forces are equal or balanced. That means we stay still.

Who is Isaac Newton? What did he discover? Discovering Gravity: Children watch this clip https://www.bbc.co.uk/education/clips/zhmqxnb

to find out about how Isaac Newton discovered gravity.

Respond 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. E.g.

Learn Weight and Mass: Explain the difference between weight and mass, and how to measure them The weight of an object is a measure of the strength of gravity acting on an object and is measured in Newtons. Mass is a measure of the amount of 'stuff' inside an object and is measure in kg. Children watch this clip

https://www.bbc.co.uk/education/clips/z37w2hv to find out more about weight and mass. Show the children a forcemeter and discuss how to use it.

Respond Children to draw a table in their book and work in pairs to carry out task to measure gravity of classroom objects and record this on table.

Object	Force in Newtons (N)

Reflect Which object had the most/ least force etc.. were there any surprising results? Children to show the Christian values of friendship and respect as they work together conduct their experiment.

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)

Scientific enquiry – To take measurements, using a range of scientific equipment, with increasing accuracy and precision. FROGS research Type of scientist – I use different scientific equipment to measure with precision. I take repeat readings when appropriate. 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? **Explore** https://explorify.uk/en/activities/odd-one-out/blowing-in-the-wind What is pulling us towards to Earth? Gravity. Why aren't we pulled to the centre of the Earth? Reaction force is opposing force and is pushing us up. The forces have to be equal. **Learn** Today we are focusing on air resistance. open the PowerPoint go over the Galileo's Theory and watch the video clip of astronauts on the moon https://www.youtube.com/watch?v=KDpItiUsZw8 (see smart in resources) Summarise – objects fall at the same speed regardless of their mass because gravity pulls them down at the same speed. But they do not all land at the same time due to air resistance. **Respond** Provide each child with a paper helicopter template and paper clip. (see resources) Ask them to make. Cut solid line and fold dotted lines. Give them the opportunity to test out their paper aeroplanes. **Learn** What pulls the helicopter down – gravity. What pushes it up – air resistance. Why does it spin? – air resists the movement and pushes each rotor separately causing it to spin. Identify that aeroplanes have to keep moving to stay in the air whereas a helicopter stays in the air because the spinning of the rotor blades keep them up. Pose question -What makes a good helicopter? Tell the children they are going to plan their own fair test activity. What do we mean by a fair test? You can only change one variable. What things could they change? Give children a coloured post it notes to write on, one idea on each post it. E.g. Length of wings, add weight, type of material, shape of wings, size of propellers. Children to put their post its on table. In ability 3's children then need to decide on one variable they are going to change and one thing they will measure. Look at the other	

post it notes. To make the test fair all the other variables on these post it notes have to stay the same.

Respond Each child will make a helicopter and test in their group. Decide before planning. In books children to write question, equipment, prediction and fair test.

Reflect On whiteboard draw a picture to represent air resistance. E.g.

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

Scientific enquiry – To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS fair testing.
Type of scientist – I plan different types of scientific enquiries to answer questions.

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

Christian Value: respect, friendship

3. What makes a good paper helicopter?

Explore https://explorify.uk/en/activities/odd-one-out/shoot-the-breeze What are you investigating? What makes a good paper helicopter. What force are we exploring? Air resistance. What variable are you changing?

Learn How are you going to know if it is a good paper helicopter? What are you go to measure? E.g. Number of spins? Accuracy of landing? Number of spins? What do we mean by accuracy? How are we going to ensure that our test results are accurate? We will test three times.

Respond Draw a results table in their books, 4 rows and 4 columns. Make alternative paper helicopters. Test and record results.

Learn So what was the best helicopter? Model a PEEL! Conclusion step by step to the children, using one of the groups results. LAPS/SEN could use the conclusion flap book (see resources)

E.g. We found out that the paper helicopter with the largest wing span was the best paper helicopter. This is because it stayed in the air the longest due to air resistance.

What is next? Evidence. Discuss with partner. What do the results show? Keep the results table on the board. Take ideas from the children and model writing on the board in green. From our results we can see that the helicopter stayed in the air for ____ seconds. Move onto the explain part. Was your prediction correct / incorrect? My prediction was correct/incorrect So, what advice could you give someone based on these results? Therefore, if you would like make a good paper helicopter, make sure you have large propellers. What would you like to find out next time - How could we make our results more accurate? Next time I would like to investigate...e.g. whether the size of the wings affect how long a paper aeroplane stays in the air? What happens if you increase the weight on a paper helicopter? **Reflect** Share your results with a group that changed a different variable. Scientific enquiry - To use test results to make predictions to set up further comparative and fair tests FROGS observation over time. Type of scientist - I can set up fair tests when necessary. LO: To identify the effects of air resistance, that act between moving surfaces Christian Value: respect, friendship	
4. What surface will create the least amount of friction for a roller-skate? (Opportunity for outdoor learning - use surfaces outside) **Explore** https://explorify.uk/en/activities/odd-one-out/best-foot-forward Recap forces/ weight and mass and gravity. (see smart in resources for diagrams and prompts) **Learn** 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? Friction is a force. Friction is stronger than gravity. Friction slows moving objects down. All surfaces create friction on an object	

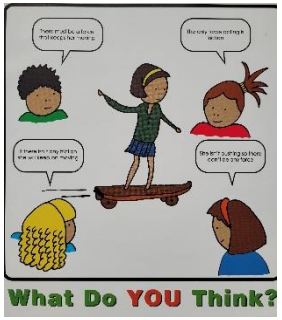
moving over them. Friction produces heat. Friction is always a useful force. Children to discuss. Go through the answers.

Watch videos https://www.bbc.com/bitesize/articles/zxqrdxs Friction is the force that stops one surface moving over another. We now know that friction is not always helpful. When is it helpful? - brakes on a bike, tying shoelaces, car tyres on road, lighting a match, slide, skiing, ice skating, drawer etc. When is it not helpful? Friction on a bike chain making it harder to pedal. Heat on tyres means they need replacing.

We are going to carry out an experiment - What surface will create the least amount of friction for a roller-skate? To do this we will have to use a newton metre to see how much force is required to move a roller skate. What will we be measuring in? newton. What surfaces could we use? Grass, gravel, carpet, table, tarmac etc. What variable are we changing? The surface What are we keeping the same? Same roller skate, same amount of force.

Respond - in books children to write question, fair test, prediction and draw a results table (2 columns heading surface and force it takes to move in Newtons, 5 rows for surfaces. Conduct experiment and record results.

So what surface did have the least amount of friction for a roller skate? Children to write PEEL Conclusion e.g. I found out that the table had the least amount of friction. This happened because it was smooth. My results show it took __N to move the roller skate. My prediction was incorrect/correct. Therefore if you want to go fast when roller skating, go on a smooth surface.



Reflect What else can this be applied to? E.g. rollerblades, skateboard, bike, ice skating, skiing. What do you think? - see picture.

Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS seeking patterns. Type of scientist - I plan different types of scientific enquiries to answer questions.

LO: To identify the effects of friction, that act between moving surfaces

Christian Value: respect, friendship

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

Explore https://explorify.uk/en/activities/odd-one-out/sleek-designs What forces have we looked at so far? On the board display pictures on the board of the forces previoOusly taught. E.g. man standing,

parachute in air, roller skate. Label the forces that are acting on the objects, e.g. friction, gravity, air resistance, reaction force. **Learn** 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. E.g. swimming, oars on a boat. 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? E.g. aeroplane/train/shark Its nose is **pointed** so that it can cut through the air, and it has a **smooth, low, curved back** to allow the air to flow over and around it. 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. **Respond** Children to investigate the effects of water resistance on different shaped objects. Do this by giving the children bowls/jugs. Children to make different shapes and drop- them in the water. 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. After your exploration 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? Answer these three questions in books - Which had the most water resistance and why Which had the least water resistance and why Were you correct? **Reflect** https://www.bbc.co.uk/teach/class-clips-video/science-design-and-technology-ks2-investigating-air-and-water-resistance/z4m6nrd 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 – To use test results to make predictions to set up further comparative and fair tests FROGS observation over time.
Type of scientist – I can set up fair tests when necessary.

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

Christian Value: respect, friendship

6. How do pulleys help us?

Explore https://explorify.uk/en/activities/odd-one-out/making-work-easier

Learn Provide the pairs with iPad and get them to take photographs throughout the session. Provide children with a pulley. Let them explore for a few minutes. Don't tell the children how they work, just let them explore. Show todays question – What is a pulley? Learn what a pulley is. It is just a wheel with a groove running all the way around it. pulleys are used to allow a smaller force to have a greater effect. Watch https://www.youtube.com/watch?v=Nj4J7QNeBNk to explain why a pulley is. https://www.bbc.co.uk/teach/class-clips-video/science-physics-ks2-ks3-will-pulleys-let-9-year-olds-beat-Britain%E2%80%99s-strongest-man/zvm4d6f

What pulleys can you think of? – show children some examples.

Respond In pairs give the children a plastic cup with a hole at each side, a bobbin, a straw, blue-tac and some string. Show how to put it together to create their own pulley. (Recommended instead of using pulleys from explore part of lesson)

Give the children a weight to put in the bottom of their cups. Ask them to lift the cup by hand. Now try using the pulley. Which is easier? Highlight that It is easy to lift with a pulley as a pulley allows us to use a smaller force to lift a larger load.

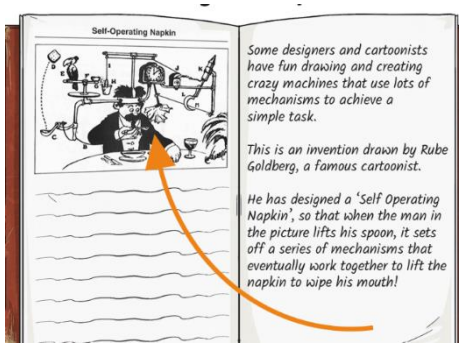
Upload the photographs taken onto the activity assigned on seesaw. Children to add what pulleys are and why they are used. **Reflect** On the board display an Egyptian pyramid. How did the Egyptians get the stone up to build the pyramid? Why did they use a pulley? They couldn't lift the stone as they were too heavy, so they had to use a pulley. Scientific enquiry - Scientific enquiry - 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 FROGS seeking patterns. Type of scientist - I can report and present findings using speaking and writing including displays and presentations. LO: To recognise that some mechanisms including pulleys allow a smaller force to have a greater effect Christian Value: thankfulness	
7 How do gears and levers help us? (Opportunity for outdoor learning - gear, lever and pulley hunt) **Explore Odd One Out**: different types of lever (scissors cutting paper, see-saw in the park and bottle opener) **Learn** Have a tin of paint/golden syrup in front of the children. Can I use this 5p to open the tin? What about this screwdriver? Which would be best? Use the materials provided to explore levers. Investigate how the position of the fulcrum affects the effort (force) required to lift a heavy load. (pattern seeking) Give the children a ruler, a pencil/glue stick and a weight. Use blue-tac to stick the weight to the end of the ruler. Ask the children to put the pencil/glue stick under the ruler. The scientific name for the pencil would be the fulcrum. Where is it easier for the fulcrum to be for you to lift the weight? What happens if you move your finger closer. What happens if you move the fulcrum. Is there a pattern between place of fulcrum and weight, closer the load to fulcrum less force/effort needed. What are levers? https://www.bbc.co.uk/teach/class-clips-video/science-ks2-what-are-levers/zr3d239 What about when opening door, does it matter where your hand goes? Simple machines are mechanical devices that are used to make work easier. A lever is a simple machine which uses the basic principles of force, pivot and load. The pivot or fulcrum supports the action so that when an effort is applied to	

one end of the lever, a load is applied at the other end and this will move a mass upward. If the fulcrum is closer to the load, then less effort is needed to move the load a shorter distance. What levers do we use? Levers comprise many common items used every day such as scissors, pliers, nail clippers, wheelbarrows and bottle openers.

Respond Children to draw a diagram to represent a lever by drawing the ruler and fulcrum. Where should the fulcrum be placed to ensure a smaller force is needed to have a greater effect?

Learn What about gears? Gears or cogs can be used to change the speed, force or direction of motion. Gears are wheels with teeth, or indentations, which lock together to turn one another. If you connect two gears together, the first gear is large that the second, the second gear will turn much faster than the first. This way you can increase the speed of motion. If the second wheel in a pair of gears is larger, it will turn much more slowly than the first, but with more force. When two gears are connected, they always turn in opposite directions to each other. This is how gears can change the direction of motion. Use https://www.dkfindout.com/uk/science/simple-machines/gears/ to help explain this.

Watch https://www.bbc.co.uk/teach/class-clips-video/science-physics-ks2-ks3-will-gears-let-children-pull-a-piano-uphill-with-their-bikes/zmcpy9q How are gears used to pull the piano up the hill? Some games e.g. mouse trap use gears and levers to work. Look at diagram of self operating napkin. How does it work? Look at diagram



Respond Using what you have learnt on gears, levers and pulleys children to design their own marvellous machine. Draw and label features and explain what your contraption does.

Reflect Share you contraption with your peers. Are there gears, levers and pulleys? Are they used effectively? children to be thankful at how these inventions have eased our daily lives.

Scientific enquiry - 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 FROGS seeking patterns.
Type of scientist - I can use relevant scientific language and illustrations.

LO: To recognise that some mechanisms including levers 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	**Key Vocabulary**
1. How could we classify animals? **Explore** https://explorify.uk/en/activities/odd-one-out/terrific-tree-dwellers **Learn** Sit the children into ability pairs for this session. Show the children images e.g. Lego, leaf, frog, broccoli, pepper, parrot in red or green. How could we sort them into two groups – colour, living/non-living etc Let's learn some new vocabulary. When living things are grouped it is called classification and each group is called a class. Classifying living things is called taxonomy and the people who classify are taxonomists. Pose the questions – How could we classify animals? Children to jot ideas onto post it notes. Listen to children's responses and record on whiteboard. Introduce the children to Carl Linnaeus https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-carl-linnaeus/zhnjf4j Explain why he was important and that today we are becoming taxonomists and are classifying different animals.	Amphibians, animals, arachnid, bacteria, birds, classification, cold blooded, crustacean, fish, fungi, fungus, insects, invertebrates, keys, kingdoms, live birth, mammals, micro-

Provide each child with their differentiated success criteria. What words can they remember the meaning of? What have they forgotten? Go through the vocabulary of all the terminology. MAPS Mammal, amphibian, bird, fish, reptile, insects, invertebrates, vertebrates HAPS Same as MAP including mollusc, crustacean, arachnids, and annelids LAPS Mammal, amphibian, bird, fish, reptile, insects, SEN Mammal, bird, insect and fish specific on their characteristics e.g., warm blooded, lives underwater, flies **Respond** Provide the pairs with differentiated pictures of animals (see resources). Ask the children to use their marking ladders to classify the animals into different groups. Now we've classified the animals into the different groups, what features make them belong in that group? E.g., mammals are warm blooded and drink milk from their mother. Vertebrates have a backbone, invertebrates don't. In books children to stick in success criteria. Then focusing on the vocabulary on their marking ladder, record using a thought shower. Or any way the children want to, the features of the individual groups, ready for next classification lesson. An example is on the board. **Reflect** Fill in the gaps. When living things are grouped it is called ____ (classification) and each group is called a ____ (class.) Classifying living things is called _____ (taxonomy) and the people who classify are _____ (taxonomists). Children to be thankful for our amazing world. Scientific enquiry – 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 FROGS grouping and classifying.	organisms, mollusc, mushrooms, organism, perennial, annual, biennial, plants, reptiles, vertebrates, warm blooded, worms

Type of scientist - I can report and present findings using speaking and writing including displays and presentations. LO: To describe how animals are classified into broad groups according to common observable characteristics. Christian Value: thankfulness	
2. Can a classification key help us to identify different living organisms? **Explore** https://explorify.uk/en/activities/odd-one-out/feathered-friends Quick recap - give me three features of a mammal? Reptile? Amphibian? Annelid? Bird? Fish? etc **Learn** Give the children some liquorice all sorts in groups of three and ask them to sort them. Could use a Venn diagram, Carroll diagram or into groups. How could they split them into smaller groups - classification key. Highlight that with a classification key, questions must have a yes or a no answer. E.g., is it a round? Go through the PowerPoint on classification on the smart (see resources) Look at an example of a classification key on the board. Give LAP SEN one on their table. Put some spare on the science help desk. Seat in ability pairs - Ask the children to look back at their success criteria from last classification lesson on the features on animals. What features can you remember about the groups on your marking ladders. E.g. only HAPS to name features of annelids. Go through the features of basic groups e.g. mammals and birds. What are there key characteristics. Children to act as taxonomists and classify animals given. Use the work they did previously to help them. Focus on key scientific vocabulary. Children to record in books. Example of how to start is on a smart slide HAPS MAPS classify 6 animals LAP SEN classify 4 animals using template (if needed) HAPs if completed - how else could you do it? Could you create a key with different animals?	

Put strips of different animals on the science help desk for the children to classify. **Reflect** On the board display a classification key which is incorrect. E.g. animals not classified into individual groups, or animals being sorted into two groups. You could use a child from the class if they have a misconception. What is wrong? What advice would you give someone who had these misconceptions.Children to be thankful for our amazing world and understand we need to look after it. Scientific enquiry - To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS grouping and classifying. Type of scientist - I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. LO: To give reasons for classifying animals based on specific characteristics. Christian Value: thankfulness	
3. How could we classify plants? (Opportunity for outdoor learning - plant hunt) **Explore** https://explorify.uk/en/activities/odd-one-out/what-is-inside-flowers Recap previous learning - in pairs, on whiteboards, create a classification key of the animals - lion, giraffe, snail and angel fish. Go through a potential key. Identify any misconceptions. **Learn** Tell the children that today we are going to be classifying plants. How could they classify the plants on the board? - we need to learn some facts about the different groups of plants. We are going to watch a video and go through the different groups of plants. (see smart in resources) The children may want to make notes as it would help them later. https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-classifying-and-grouping-plants/zh9jvk7 Vocab check on plants and their characteristics Ferns - no flowers/seeds. Have spores Conifers - have cones and needles Flowering plants Mosses - no roots or flowers	

On the board display a classification key template. How could we classify plants? either work through it as a class or in their pairs. Look at an example. **Respond** Children to create a classification key on plants. SEN LAP 5 plants MAP/HAP 6 plants HAP 8 plants (depending on understanding of classification keys from the animal lesson) Extension – on science help desk put a mixture of animals and plants. Children to create classification keys of a combination of the two. **Reflect** Display on board a mixture of animals and plants. How could we create classification keys of a combination of the two? Share ideas from those who completed extension activity. Scientific enquiry – Scientific enquiry – To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS grouping and classifying. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. LO: To give reasons for classifying plants based on specific characteristics. Christian Value: thankfulness	
4. What are micro-organisms? **Explore** https://explorify.uk/en/activities/have-you-ever/found-mould-growing-on-bread-at-home Fill in the gaps. When living things are grouped it is called ____ (classification) and each group is called a ____ (class.) Classifying living things is called _____ (taxonomy) and the people who classify are _____ (taxonomists).	

Learn Go through the PowerPoint on micro-organisms (see resources) - 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. Pose the question - What conditions cause mould to grow? Tell the children that they will be putting bread into three food bags and leaving them for two weeks to see where mould grows. Discuss what is meant by a control. What variable could you change? - Temperature, fridge/freeze, warm place, dark place 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. **Respond** Children to plan experiment and set it up. Plan to include question, method and prediction. **Reflect** Display elephant, mould, sunflower and dust mite. With partner and whiteboard can they create a classification key. Look at the results in two weeks. Where would it be best to keep our bread. Verbal discussion. Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS observation over time. Type of scientist - I plan different types of scientific enquiries to answer questions. 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: respect, friendship	
5. What are the five kingdoms of living things? **Explore** BIT odd one out display on board for when children come in. Tree, mushroom, lion	

Let's recap (all answers on smart) – what is a taxonomist? Who is this? Why is Carl Linnaeus important? What three ways have we classified living things – into animals, plants and bacteria.

Learn There are five kingdoms. We have already learnt about three of them. On the board display the five kingdom wheel. What do you notice about the five kingdom labels – highlight that they are in Latin. Show them in English what the words mean.

Show the children a table with the headings of the different kingdoms and their key features- move, feed and reproduce.

Respond MAP/HAP Children to complete the table by using the IPads to research the answers. Literally put into google, do bacteria move, do bacteria feed, how do bacteria reproduce. We will go through answers (on the board) so the children can self mark.

LAP/SEN cut and match activity – features, kingdoms and examples. On the science help desk put the answers. They can collect and self mark when finished.

Reflect Go through the answers on the whiteboard, MAP HAP to self mark.

Learn Now tell the children that all living things are grouped into the five kingdoms. Work through the PowerPoint.(see resources)

Choose a lion as an example, and show the children how Carl Linnaeus classified the lion into species and genus.

The lion belongs to the following groups:

- Kingdom **Animalia** (includes all animals)
- Phylum **Chordata** (includes all vertebrate animals, as well as some other more primitive ones)
- Class **Mammalia** (includes all mammals)
- Order **Carnivora** (includes carnivorous mammals, from bears to raccoons to harbour seals)
- Family **Felidae** (includes all cats)
- Genus **Panthera** (includes the great roaring cats: lions, tigers, jaguars, and leopards)
- Species **Leo** (lions

Scientific (Binomial) name – Panthera Leo

What do the children notice about the name it is in Latin. This is so that in any country regardless of the language they speak, if you asked in a zoo to see a Panthera Leo they would tell you where the lions are.

Respond Ask the children to choose their favourite animal/plant and ask them to use the IPads to find their scientific name. Children to record each stage e.g.

The ???????? belongs to the following groups:

- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species

Scientific name –

Reflect

What scientific names did you discover? Share children's findings. Were their any common features? E.g. Panthera for cat animals.

Scientific enquiry – 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 FROGS research.
Type of scientist – I can use relevant scientific language and illustrations.

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 Biology	
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. How do drugs impact our body? PSHE and science Big question – what if medicine/penicillin had never been discovered? **Learn** What do we mean by drugs? Discuss drugs, alcohol and smoking by going through the PowerPoint (see smart in resources. Give children a piece of A3 paper to jo notes on as we go through it. Recap – what are the four groups of drugs - 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). **Respond** - Create a poster on drugs, focusing on the positive and negative affects they can have on the body, including the four drug groups – socially acceptable drugs, over the counter medicines, prescribed drugs and illegal drugs. Children to use notes made to help. **Reflect** – Are all drugs bad? – No. Why? 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 FROGS research.	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

Type of scientist - I can report and present findings using speaking and writing including displays and presentations. LO: To recognise the impact of drugs on the way their body's function Christian Value: respect	
2. How does our diet impact our body? PSHE and science **Explore** https://explorify.uk/en/activities/the-big-question/which-breakfast-is-best What are the food groups? Can anyone remember any foods that are in the food groups? Go through the PowerPoint (resource on smart in resources) on the Eatwell plate. **Learn** Go through healthy lifestyle PowerPoint. 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. Ca, they explain why? Provide children with two nutrition cards. (in the resource box in PPA room) Go through nutrition. Show two foods on the board. Which are which? Which has the most sugar? Salt? Then give children about five minutes to look at their nutrition cards. Then put the questions on the board e.g. Which food has the most salt? Saturated fat? Which would be best for a marathon runner? Why? **Respond** - using the nutrition cards, children to compare different foods. One sheet per pair. Verbal activity Go through what they have found out. Were their any surprises? Show two food products. Which would be the healthier option? Why? TASK - comparing two drinks and answering comprehension questions. Self mark **Reflect** Ask children to reflect on their own diet. Think about three positive things and one thing they could improve. Children could share or keep their reflection to themselves. 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. FROGS research	

Type of scientist – I can use relevant scientific language and illustrations.

LO: To recognise the impact of diet on the way their body's function

Christian Value: respect

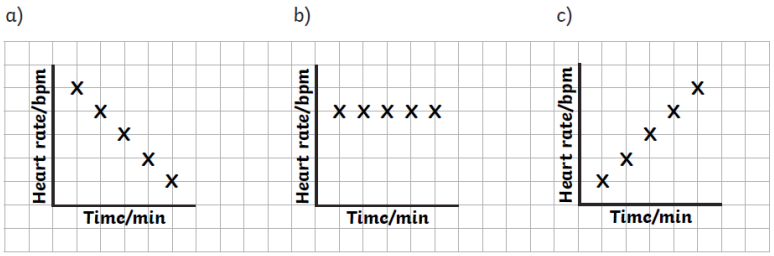
3. How does exercise impact our body? (Opportunity for outdoor learning)

Explore https://explorify.uk/en/activities/what-if/we-couldnt-exercise

Learn Pose the statement – exercise has no impact on the body. Children to prove or disprove this statement. How could you do it?

Respond Children to set up their own experiment to either prove it or disprove it e.g., HIIT workout / yoga / meditation / PE 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 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.

Reflect – Our heart rate can change depending on what we are doing, Which would most likely be somebody's heart rate when they are sleeping?



What do you think the other graphs could represent? Think about what the person might be doing. A – could be cooling down after a work out. C – could be increased heart rate during exercise.

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 FROGS observation over time.

Type of scientist – I decide what observations and measurements to make.

LO: To recognise the impact of exercise on the way their body's function

Christian Value: respect, friendship

4. What are the four chambers of the heart?

Explore https://explorify.uk/en/activities/zoom-in-zoom-out/pink-and-spongey what do the children think this is? Zoom out one at a time repeatedly asking the children what they think it is.

Learn On the board display three systems - skeletal, muscular and digestive. What are the purpose/function of these systems.

Introduce circulatory system (heart and blood) and respiratory system (breathing/lungs) Discuss what these mean and what children already know.

Today we are looking at the heart. Watch https://www.youtube.com/watch?v=DB5HxSPGVp0 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 blood vessels - Children to identify blood veins on underside of lower arm. Anywhere else?

Listen to heart beat using either stethoscope's

https://www.youtube.com/watch?v=gJpTwHZeF8 It is a lub-DUB sound and is the sound made by the heart valves as they open and close. take photos for seesaw

Learn about the different parts of the heart and their functions by looking at power point (see smart in resources) about the heart and its function. Watch https://www.bbc.com/teach/class-clips-video/circulation/zhf76v4 up to 1min 17! https://www.youtube.com/watch?v=2jPTt23lRB8

Respond Children to use fimo to create a model of the heart. Use two colours to show the different sides of the heart. Use the resource card for support and label heart. LAPs to used fimo to create heart, maps add labels, haps label and add key facts take photo for seesaw

Reflect When might the heart work faster and why? What are the four chambers called. Children to respect their bodies and how it is important to look after it to keep us healthy.

Scientific enquiry - 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 FROGS grouping and classifying.

Type of scientist - I can use relevant scientific language and illustrations. LO: To identify and name the four chambers of the heart. Christian Value: respect	
5. How does blood travel through our body? (Opportunity for outdoor learning - drama activity outside. Draw heart on playground floor) **Explore** https://explorify.uk/en/activities/odd-one-out/get-your-blood-pumping What did we do time on the heart? Show the children a diagram of a heart. Can they remember any of the parts? Which side is deoxygenated? (right) Where does the blood go to get oxygen? (lungs) where does the oxygenated blood go? (to all the organs around the body) **Learn** Watch https://youtu.be/ep4cQrYFL0w on the British Heart Foundation clip on how the heart works. On smart, looking at a diagram of the heart, teach the children the four new words - aorta, pulmonary artery, pulmonary vein and vena cava. Task. Outside or in classroom complete a drama activity. Set the heart up using tables as shown on the smart. Take labels and coloured card. (In science cupboard) On the floor using rough heart, that is split into the four chambers and lungs. In lungs put red cards. Children to use cards to label parts. Discuss with the children based on last week and the idea just watched where does the blood enter 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 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). Teacher to record drama activity - record for Seesaw Watch https://www.youtube.com/watch?v=oHg5ZyrI4NY to consolidate drama activity. **Respond** Children to now label their own heart and complete the differentiated challenges on sheets . Differentiated activity (see resources) Self-mark	

Reflect Watch https://www.youtube.com/watch?v=tqsuu9DiJWQ operation ouch on valves, veins, and arteries. Highlight the importance of valves and identify that there are three main types of vessels in your circulatory system. Arteries (red) take blood away from the heart, veins (blue) carry it back to the heart and tiny capillaries link arteries to veins. Children to respect their bodies and how it is important to look after it to keep us healthy. Scientific enquiry – 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 FROGS seeking patterns. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. LO: To identify and name the main parts of the human circulatory system, and describe the functions of the heart. Christian Value: respect	
6. How are water and nutrients transported in our body? **Explore** https://explorify.uk/en/activities/odd-one-out/it-takes-more-than-guts On board display protein, minerals, carbohydrates fats, water, vitamins and fibre. What do these have in common? They are nutrients which our body needs. Go through the slide recapping nutrients. (on smart in resources) **Learn** In pairs give the children a picture of the digestive system. What can they label? Children to label and then go through the answers together. Using their labelled images on the digestive system – how do we digest our food? Can they recall from y4? Go through how we digest food, children to follow using their diagram. https://www.youtube.com/watch?v=eSEYPO30AN0 How our body absorbs nutrient BBC teach clip. Reinforce that nutrients and water are absorbed in the small intestines. Point them out on their digestive system diagrams. Could also look at the body What do the children know about their kidneys? Watch operation ouch https://www.youtube.com/watch?v=Bn8czDqPUvY	

Respond Then give the children the key facts and ask them to have a go with their partner to cut and put them in the correct order. TAKE photo for Seesaw

- Nutrients are absorbed into the blood in the small intestine.
- The nutrients are carried in the blood to the different parts of the body that need them.
- Waste from the small intestine is passed through the cecum into the large intestine.
- The dry waste is stored in the rectum and is pushed out of the body as faeces through the anus.
- The kidneys filter out waste from the blood and the waste is turned into urine and flows to the bladder.
- The kidneys allow the nutrients in the blood to flow to the rest of the body where they are needed.
- When the bladder feels full the brain says, "Go to the toilet!".

Practical task to highlight how water and nutrients are absorbed.

So how are the water and nutrients absorbed? Give the children a jelly worm How long is your worm? What would happen if we put the worm in water? It would absorb it. Give the children a worm that has been in water for a couple of hours. What has happened to it? It is bigger because the water has been absorbed. The worm represents the water in our bodies.

Give the children some skittles. They represent nutrients. What will happen when they break down? Children to put skittles in water to show that as the nutrients break down (the colour) it is absorbed into the blood.

TASK on Seesaw upload photos and explain how water and nutrients are transported by the body.

Reflect #learning. Summarise the lesson in three #Children to respect their bodies and how it is important to look after it to keep us healthy.

Scientific enquiry – 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 observation over time. Type of scientist – I can report and present findings using speaking and writing including displays and presentations. LO: To describe the ways in which nutrients and water are transported within animals, including humans. Christian Value: respect	
7. What is blood? **Explore** https://explorify.uk/en/activities/zoom-in-zoom-out/red-doughnuts/classroom What do they think it is? Put on board for when children come into classroom. Together click on link and zoom out. What do they think it is each time? What do you know about blood already? Partner talk and feedback. Operation ouch blood- Watch up to 5mins https://www.youtube.com/watch?v=nnH6Q0u2-BI **Teach** What is blood made of? Teach composition of blood: look at 'all about blood' PowerPoint. Look at test tube visual of composition and discuss proportions. Watch https://www.youtube.com/watch?v=68HyQPx-kso Watch http://www.bbc.co.uk/programmes/p00w5swz (white blood cells function and immune system) https://www.youtube.com/watch?v=UhqcB34AwpU (red blood cells function) https://www.youtube.com/watch?v=KtmHdGRBE2E (platelets) Discuss what each component is after each clip. Show chn 'ingredients' for blood. Which ingredients represent which parts of blood? Chn guess. Let chn 'make' blood in a beaker using ingredients to show proportions. TAKE PHOTO Platelets: **rice crispies** (a few) **Water**: Plasma (just over half the beaker) White blood cells **mini marshmallows** (a few) Red blood cells –**red candy OR cheerios mixed with red food colouring water** (just under half of the beaker) **TASK** In books draw a picture of beaker and label each element of blood. Write a statement to explain what each element is and why they are important. HAP include how much each component makes up e.g. 55% plasma, 45% red blood cells <1% plasma and white blood cells **Reflect** So what is blood made of? What are the functions of the different components? What are the percentages of each component?	

https://www.bbc.co.uk/bitesize/topics/zcyycdm/articles/z9w9r2p#zwbxxbk5 watch blood section Highlight what has been learnt today on knowledge organiser. 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 FROGS grouping and classifying Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs. LO: To explain the composition and function of blood. Christian Value: respect	
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	**Key Vocabulary**
1. What is inheritance? **Explore** https://explorify.uk/en/activities/odd-one-out/half-and-half	Adapt/adaptation, advantages,

Learn On the board show the words inheritance and adaptation. Does anyone know what the words mean? Go through the PowerPoint (smart in resources) and sort the inheritance cards into inherited characteristics and acquired characteristics. Watch https://www.bbc.com/bitesize/articles/zp9f4qt (BBC clips on inheritance) Do any of the children get told they look like a family member? Do they look like their brothers or sisters? What features is said that they have inherited? When do we see humans who look very similar to each other – identical twins? Show photographs of identical twins (or use real life ones from school!). Briefly discuss how identical twins differ from non-identical twins. Non-identical twins are similar to two siblings born at different times – each one grows from a separate egg that was fertilised by different sperm (so they may share some features but will usually look different & may be of different gender). Identical twins develop from one egg which splits into two at a very early stage of development. Identical twins have the same genes/chromosomes as each other & are always of the same gender – male or female. Show the children examples of Mr Men and Little Miss books. Try and get the actual books if possible. What would happy if Mr Strong reproduced with Little Miss Tiny? Look at the features of the characters? Model to the children how to create a family tree. What would then happen if their offspring reproduced with Mr Greedy? Add another branch onto the family tree. **Respond** Children to create their own family tree using Mr Men and Little Miss. **Reflect** In animals it is called selective breeding. Farmers use it to create the best animals for wool or meat. On the board display Labrador and poodle. They have been cross bred to create what? Show pictures of labradoodle. What features have been inherited? This has been done with lots of different breeds of dog. Look at pictures on smart. Can children match up the cross breeds. E.g. cocker spaniel and poodle = cockapoo. Pug and beagle = puggle Scientific enquiry – 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 FROGS observation over time. Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs.	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

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?

Explore https://explorify.uk/en/activities/odd-one-out/brilliant-brain-case **On the board display one of the children's offspring from Little Miss and Mr Men inheritance lesson. Who do the children think the parents are? Repeat with another.**

Learn Do you know what any of these words mean?

- **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.

Who introduced the idea of the theory of evolution - Charles Darwin. Go through the PowerPoint. Go through the next few slides on common ancestors.

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)
https://www.youtube.com/watch?v=Cnrisw6kDoA

Respond Provide children with human evolution cards. (see resources) Children to create an evolution timeline. HAPS match the names to the pictures and create a timeline. HAP 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, knee caps, pelvis) **Learn** How do we know these changes have occurred? Let's look at Lucy https://www.youtube.com/watch?v=eEmIoRkUcKk **Respond** Give children the text on Lucy. In books answer the questions in full sentences. LAP give them differentiated questions. (see resources) **Reflect** Is it just humans who have evolved? https://www.bbc.com/bitesize/articles/z9qs4qt Watch video about The Earth's evolution. http://www.bbc.co.uk/education/clips/zyjqycw Scientific enquiry - To identify scientific evidence that has been used to support or refute ideas or arguments. FROGS observation over time. Type of scientist - I can report and present findings using speaking and writing including displays and presentations. 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? (Opportunity for outdoor learning - school garden) https://explorify.uk/en/activities/odd-one-out/fantastic-foxes **Learn** Watch https://www.bbc.com/bitesize/articles/zxg7y4j BBC clip on adaptation. Go through PowerPoint On adaptation. (on smart in resources) Pose question - how have barn owls adapted to be a good predator. Children could make notes if they wish. Watch https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-how-animals-have-adapted-to-become-good-predators/z4pqxyc. Go through how they have adapted. (several owl adaptations, including how it has evolved to have a curved beak to catch prey, feather adaption for silent flight, lots of extra bones in their neck which enables them to move their head around, and how their ears are adapted to enable them to pinpoint where a sound comes from.)	

Respond Sort animal adaptation twinkl PDF - 2 star. (see resources) Take a photo for seesaw. Go through the answers and self mark. Children to then choose one of the links on seesaw and research how animals have adapted to live in an environment or an animals itself. In books children to create spider diagram on the animals or habitat that they have chosen. EXAMPLE ON SMART https://www.dkfindout.com/uk/animals-and-nature/bears/ bears https://www.bbc.co.uk/programmes/p01190rd cacti adaptation https://www.bbc.co.uk/programmes/p0118z79 how animals survive in the desert https://www.bbc.co.uk/programmes/p0118r4r how fish are adapted to live in water https://www.bbc.co.uk/programmes/p0118csn bromeliad growth in the rainforest https://www.bbc.co.uk/programmes/p00q4plm camel in the desert https://www.bbc.co.uk/bitesize/guides/z66cxwx/revision/3#:~:text=Polar%20bear&text=thick%20layers%20of%20fat%20and,increase%20grip%20on%20the%20ice adapting to cold weather **Reflect** - children to share their work with someone who chose a different environment/animal Children to show compassion towards animals that have not survived due to being the weaker species. Scientific enquiry - To identify scientific evidence that has been used to support or refute ideas or arguments. FROGS observation over time Type of scientist - I can report and present findings using speaking and writing including displays and presentations. 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? https://explorify.uk/en/activities/odd-one-out/animal-fossils 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 identity 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 titaalik 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 - To identify scientific evidence that has been used to support or refute ideas or arguments. FROGS observation over time. Type of scientist - I can report and present findings using speaking and writing including displays and presentations. 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	**Key Vocabulary**
1. How does light travel? (Opportunity for outdoor learning - light source hunt (lampposts, car headlights, sun. NOT a light source - road signs as reflect light)	Absorption, angle, coloured

Explore https://explorify.uk/en/activities/odd-one-out/sources-of-light Re-cap from year 3: Tell me teach me. **Learn** What do we mean by sources of light? Watch https://www.bbc.co.uk/programmes/p019yjp8 Look at and discuss sources and not sources-which are which? Discuss misconception of moon/mirror/signs/cats eyes. What is the main source of light? Discuss sunlight's importance. Plants – light energy for food – food chains. Look at tradition light bulb and energy saving one and compare. What else do these light sources have in common? Fire, bulb, sun, candle, matches etc (think about senses) Most light sources also produce heat. Also highlight that some are artificial, and some are natural. How does light travel? Watch video https://www.youtube.com/watch?v=WrQsq8s8XzU What do we now know about light and how it travels? Light travels in a straight line. **Respond** Challenge children to set up a demonstration that light travels in straight lines by trying to reflect the beam of light to hit a target. (targets in the PPA room) Challenges (sees smart in resources) Teacher to also challenge asking what the minimum number of mirrors needed? Chn to take photos and upload to Seesaw, HAPs to include an explanation of what happened and why. **Reflect** – Display moon, sun, normal bulb, energy saving bulb and light travelling in a straight line. Tell your partner three things you have learnt today. Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry – To use test results to make predictions to set up further comparative and fair tests FROGS seeking patterns. Type of scientist – I ask different kinds of questions. LO: To recognise that light appears travel in straight line. Christian Value: respect, friendship	filters, eye, lenses mirror, prism, spectrum, straight
2. How do we see objects? **Explore** https://explorify.uk/en/activities/what-if/there-were-two-suns	

Display the pictures from the reflect part of last light lesson. What can the children remember. Recap how light travels – in a straight line.

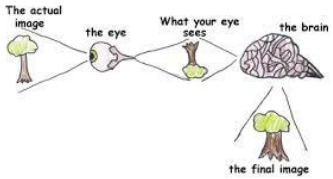
Learn Look at cave concept cartoon (On smart in resources) **Talking partners** Recap – what is darkness – the absence of light (y3) Discuss total darkness. We would see nothing. Discuss what you can see most clearly in low light – bright coloured objects, can't really make out colours, etc. So how do we see? What did the activity last week (hit the target) show us? Light travels in a straight line. Work through the PowerPoint (on smart) To highlight further that light travels in a straight line, provide groups with some wool (preferably yellow) This wool will represent the beam of light and remembering to keep it in a straight-line children to model how light travels in straight lines from light source, to an object, which is reflected into our eyes. Recap again how we see and that light is reflected into our eyes. On the board show images (on smart) and model how to draw the arrows representing how we see.

Respond Children to stick in a different sheet and draw the arrows representing light. Go through answer and self mark. Address any misconceptions.

Learn In pairs ask the children to carefully observe what happens to the size of the pupil as their partner slowly moves to face a light source (not the Sun!). (One partner can close eyes then open them in light whilst partner watches – change over) Why do you think?

Explain, using poster /model of eye and pics on smartboard how we see. Show children the video clip https://www.youtube.com/watch?v=upldqjdZZDw – Operation ouch – eye lens

Respond Children to draw a scientific diagram in books showing how we see objects. Children to write underneath in their own words how we see.



Reflect Show the children a diagram of light reflecting with a mistake. E.g. the light reflecting off the eye before the object. Or the light not in a straight line. What has this person misunderstood?

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

Scientific enquiry – To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs. FROGS seeking patterns.

Type of scientist – I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, 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

3. What shape are shadows?

Explore BIT *Why do footballers have more than one shadow?* How is a shadow created?

Learn https://www.bbc.co.uk/programmes/p0119853 where does light and shade come from. Look at the children's drawings on smart – what is wrong?

Pose the question – What shape are shadows?

Respond In threes, children to explore and answer this question.

Children to write a P conclusion – I discovered that shadows are the same shape of the objects that cast them.

Learn Show children concept cartoon to stimulate a discussion about shadows and whether they can be changed. In their three children to decide what they would like to investigate.

Respond Add ! to their conclusion Next time I would like to find out...

Using the ! part of their conclusion children to plan full experiment in books ready to conduct next week. Highlight that they need to be clear what equipment they need, so we can get it ready. How can we make it a fair test? How will you record your results? Will they test accuracy? Complete the test twice? Or just once? Expect to see question, method, equipment, fair test, prediction in books.

POSSIBLE Qs

Does the length of the shadow change when you move the light source?

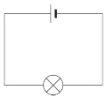
Does the length of the shadow change when you move the object?

Does a shadow become **sharper** when it is closer to a light source? Are all shadows black? Can you change the colour of a shadow? Does an opaque object produce a sharper shadow? Does a transparent object produce a shadow? Does a transparent object produce a fuzzier shadow? **Reflect** Share your experiment with a peer. Ask them what their prediction is. Do they agree with you? Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS fair testing. Type of scientist - I plan different types of scientific enquiries to answer questions. LO: To explain why shadows have the same shape as the objects that cast them	
4. Can I conduct an investigation on shadows? Explore BIT https://explorify.uk/en/activities/odd-one-out/in-the-shadows What shape are shadows? They are the shape of the object that casts them. Learn What question are you answering? How could you record your results? Model to the children that one column of the results table will be the variable that is changing. E.g. the distance of the torch from an object. The other column is what is being measured e.g. size of the shadow. How can we design our table so that accuracy can be recorded? **Respond** Children to draw results table and then conduct experiment and record results. What did you find out? Children to write PEEL conclusion. Give children PEEL! Marking ladder to self assess. If children finish they can conduct another experiment, e.g. the ! part of their conclusion - no recording needed. Reflect present what they have found out to the class	

Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment. Scientific enquiry – To use test results to make predictions to set up further comparative and fair tests FROGS seeking patterns. Type of scientist – I decide what observations and measurements to make. LO: To conduct a scientific enquiry to answer a question on shadows. Christian Value: respect, friendship	

Feedback:

Year 6 Electricity Physics	
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. Can you use symbols when drawing a simple circuit diagram? **Explore** https://explorify.uk/en/activities/odd-one-out/battery-bonanza On tables give the children a variety of equipment to make circuits. Allow them 5 mins to explore and create different circuits. (Assess how much can they remember from year 4.) **Learn** Now you've made some circuits we are going to think about how you draw them. Do you just draw the objects when drawing a circuit? What information do you need to know before you can do this – what the symbols are? Go through the difference between a battery and a cell.	Circuit diagram, circuit symbol, current, fuse, resistance, terminal, voltage, volume, series

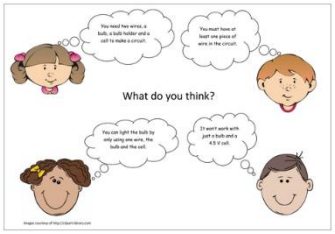
Respond Children to match symbols to description and picture and stick onto sheet. Go through the answers and peer mark. (see resources for smart and worksheet) **Learn** How do we use these symbols to draw a circuit? Why do scientists use the same symbols? Can children draw a circuit containing a bulb, wire and cell? Compare the children's drawings of a simple circuit. Have they used a ruler? **Reflect** On the board display two simple circuits with a bulb, cell and buzzer. Which of these circuits are correct? They are both correct. The cell is in a different position but it is still a complete circuit which means the electricity can flow through it and light up the bulb.   Children to persevere when making the different circuits. Scientific enquiry – To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS grouping and classifying. Type of scientist – I can use relevant scientific language and illustrations. LO: To use recognised symbols when representing a simple circuit in a diagram. Christian Value: perseverance	circuit bulb, wire, buzzer, switch, cell, battery
2. Will the circuit work? **Explore** Display a door bell, lamp, hand fan and torch. Ask the children to give two similarities and two differences. Give the children a selection of equipment – bulb, buzzers wires, propellers and a cell. Ask them to create a simple circuit. Now draw the circuit created on seesaw activity. Can use this as an assessment. **Learn** On the board display a circuit. Will it work? Why? How can we find out? **Respond** On seesaw (see class library) show the children different circuits. Do they think they will work? Why/why not? Children to predict on seesaw whether they think it will work. Test it out and write a P conclusion – this circuit worked because it was a complete circuit and the electricity can pass through. Children to work through the different circuits on seesaw. **Reflect** How could you make the incomplete circuits on seesaw work? Display the circuits which wont work and ask the children to make suggestions.	

Scientific enquiry – To use test results to make predictions to set up further comparative and fair tests FROGS seeking patterns.
Type of scientist – I can use relevant scientific language and illustrations.

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?



Explore Concept cartoon – children to discuss the children's points of view. Are they correct?

Learn How can we control if a circuit is working? Look at a doorbell. What would happen if there was always a complete circuit? The doorbell would always be on. So what stops the electricity flowing and making the buzzer work? A switch. If a switch is on, then the electricity can flow through the circuit so the doorbell will buzz. If there switch is off then there is a break in the circuit making it incomplete so the doorbell will not make a sound.

Pose the question- does it matter where the switch goes in a circuit? Give the children access to small pieces of card, split pins, foil. Paper clips and bull dog clips. Before they can test it out they need a switch.

Respond Children to make a switch. They will not need all the resources. (They were introduced to this in year 4) Put the switch prompt cards on the science help desk so those struggling can use it to help (see science resource box) Once switches are made, children to insert them into their simple circuit to find the answer the question. Share findings. Did it matter? Why not? Take a photograph of switch and the circuit and upload to seesaw. Children to add the answer to the question.

Reflect Children to write down three tips they would give the year 4's on switches.

Scientific enquiry – To use test results to make predictions to set up further comparative and fair tests FROGS seeking patterns.
Type of scientist – I ask different kinds of questions.

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 number of volts affect the brightness of a bulb?

Explore BIT https://explorify.uk/en/activities/what-if/everything-conducted-electricity

Quick fire drawing of circuits - Draw a circuit containing a bulb, cell and on switch. Draw a circuit containing a motor, cell and off switch. Draw a circuit containing a buzzer.

Learn What would happen if you increased the volts in a circuit? Children to talk through this with their partner. Provide children with a bulb, wires and three cells. What happens to the bulb as the number of volts is increased? Highlight that some batteries are a higher voltage. What are the volts of the batteries we have in school? 1.5V. Go through the PowerPoint on Volts (see resources)

Respond In books children to draw results table and complete prediction and conduct experiment recording results. In books children to write a short conclusion on how the voltage of cells can affect the brightness of a bulb.

Reflect

What would happen to an electrical appliance that requires 3V if it were powered by 5V cell or battery? Children to show the Christian values of friendship and respect as they work together to plan and conduct their experiment.

Scientific enquiry - To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs FROGS seeking patterns.
Type of scientist - I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs.

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

5 How can variations affect how components function in a circuit?

Explore BIT discuss the concept cartoon. Who is correct? What are the children's thoughts to the statements made.

Learn What are the components of a circuit? Bulb/buzzer, cell, switch, and wire. Children are NOT to use motors.

Tell the children to choose one component and create an experiment on how varying that component can make an affect Give the children a statement and they need to fill in the gap to choose what they will investigate. Does the _____ affect how components in a circuit work? E.g., does the length of wire affect how components in a circuit work? Does the number of bulbs affect how the components in a circuit work? Does the number of buzzers affect how the components in a circuit work? Does the position of a switch affect how the components of a circuit work? Can using different conductors affect how the components of a circuit work?

Respond Children to plan their experiment by including. Question, equipment, method, and prediction.

Learn We are scientists. How can we accurately record how the components are affected? What are we measuring? We could use data loggers. Introduce the children to Arduino science journal app and show them that we can use this to measure light or sound, depending on whether they did an experiment including bulbs or buzzers. The children can have access to boxes so that they can put their circuits in a box for accurate readings for light.

Respond Children to draw results table in their books. Children to conduct experiment and record results. What have you found out?

Children to write a PEEL! Conclusion. If time give them change to explore a different question using the equipment available to them. They do not have to record anything; however they could take photos and upload to seesaw.

Reflect Children to present what they have found out from their original component variation question to the class. Compare the children's findings.

Scientific enquiry – To take measurements, using a range of scientific equipment, with increasing accuracy and precision FROGS seeking patterns.

Type of scientist - I plan different types of scientific enquiries to answer questions.

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

6 Can you protect the treasure?

Explore BIT https://explorify.uk/en/activities/what-if/all-transport-was-electric

Can you fix it PowerPoint (see resources) Can the children fix the circuit to make sure the bulb lights up / buzzer works etc. Use equipment to make a simple circuit.

Learn Set the scene. Can you protect the treasure? (give the children a rock from the box in the cupboard.) Your job is to create an electrical circuit that will give warning if someone steals the treasure using all the skills you have learnt this year. You can use two cells, as many wires as you need and either a buzzer/bulb or motor. Only one.

Respond Children to create their alarm system. Draw a picture in their books and label. Give the children prompts to help them with the recording.

What did your wires do in your alarm system?

What was the purpose of your cell/cells?

What made your bulb/buzzer/fan work/go off? Why?

Reflect Children to have the time to go and explore other peoples alarm systems as they will all be very different. Whose alarm system works well? Why? Christian value of respect by listening to others ideas and how they can contribute to our own learning.

Scientific enquiry - To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary FROGS research.
Type of scientist - I plan different types of scientific enquiries to answer questions.

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	
Feedback:	