St Augustine's Long Term Plan - Science Intent

Science

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

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

	explain how things work and why they might happen. • Use new vocabulary in different contexts.	amounts of 'screen time' - having a good sleep routine - being a safe pedestrian.	
ELG	**Listening, Attention and Understanding** • Make comments about what they have heard and ask questions to clarify their understanding.	**Managing Self** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	**The Natural World** • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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Knowledge in red is aimed at year 1, Knowledge in green is aimed at year 2, Knowledge in black is aimed at both year 1 & 2			
Year 1/2 CYCLE A	**Advent 1**	**Advent 2**	**Lent 1**
Topic	**Chemistry** Everyday Materials	**Chemistry** Properties of Materials	**Physics** Seasonal Changes Home / UK
National Curriculum	• Know and distinguish between an object and the material from which it is made. • Know, identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.	• Know and describe the simple physical properties of a variety of everyday materials. • Know, compare and group together a variety of everyday materials on the basis of their simple physical properties.	• Observe the changes over the four seasons. • Observe the weather associated with the seasons, how day length varies.
Core Knowledge	1. Know and identify a variety of common materials. Know and identify a variety of common materials and explain where they come from. 2. Know how to distinguish between an object and the material from which it is made. Know how to explain which material a variety of common objects are made from. 3. Know how to describe the properties of everyday materials. Know how to use scientific vocabulary to describe and explain the use of materials. 4. Know and describe why some materials suit certain objects better than others. Know and identify materials that are inappropriate for certain uses and offer alternatives. 5. Know the differences between opaque and transparent. Know and explain the use of opaque and transparent. 6. Know how to identify opaque and transparent materials. Know how carry out at experiment to test whether a material is opaque or transparent.	1. Know the simple physical properties of a variety of everyday materials. Know how to identify physical properties and explain their use. 2. Know how to identify physical properties of everyday materials. Know and explain the physical properties of everyday materials and the reason this material is used. 3. Know how to group together everyday materials on the basis of their simple physical properties. Know how to group and compare everyday materials on the basis of their simple physical properties. 4. Know the difference between waterproof and absorbent. Know and explain why different objects are made from waterproof and absorbent materials. 5. Know how to carry out an experiment to find out which materials are waterproof. Know how to devise their own experiment to test which materials are waterproof and which aren't.	1. Know the names of the four seasons. Know the sequence of the four seasons and that they are cyclical. 2. Know the features of the seasons. Know the features of the seasons and how they compare. 3. Know we wear different clothes in different seasons to match the weather. Know and give reasons why some items of clothes are more suited to one season than another. 4. Know how to observe and describe the weather associated with Winter. Know how to record the Winter weather on a simple chart across the week/half term. 5. Know how to observe and describe the weather associated with Spring. Know the weather associated with Spring and compare to Winter. Know the day length changes and compare in two seasons. 6. Know weather can be measured through collecting and recording simple data. Know weather can be measured through collecting and recording simple data to find a pattern across a period of time.

		6. Know how to identify materials that are magnetic. Know how to explain why a material is magnetic.	
Wider Knowledge	Know the names of materials. Know the difference between the name of an object and what it is made of. Know the properties of some materials. Know that materials are selected for purposes based on the properties.	Know that the same object can be made from different materials e.g. wooden spoons, plastic spoons and metal spoons. Know the properties of metal, paper, wood and plastic. Know that the properties of materials make some materials more suitable than others for the job.	Know the months of the seasons Know that the clocks go forward in spring and back in autumn. Know that days are shorter in winter and longer in summer. Know that it is dangerous to look directly at the sun at any time of year. Know different ways we can protect our eyes from sun damage.
Skills	1. Learn and remember the names of different materials- wood, plastic, glass, metal by labelling. Identify the names of different materials- wood, plastic, glass, metal, ceramic, cloth, rock, brick, rubber labelling pictures 2. Separate object and materials into two groups. Group objects and then group materials and then match together. 3. Learn the meaning of properties (strong, transparent) then using a range of objects identify the properties they have. Learn the meaning of properties (strong, transparent) then using a range of objects identify the properties they have describing them (e.g. the glass is transparent which means it is clear). 4. Going on a property hunt- collecting set out items around the class, the children group the objects that have the same properties into hoops. Going on a property hunt- collecting set out items around the class, the children group the objects that have the same properties into hoops comparing them (eg the metal and wood are both hard but one is waterproof). 5. Using materials on the table children to group together everyday materials recording their finding in a simple table. Know how to compare and group together everyday materials recording findings in a scientific way. 6. Give each table a different question e.g. what should I make an umbrella out of. Children to use the options given to them to decide which material would be most appropriate and present back to the class why (Oracy). Give the children a different question e.g. what should I make an umbrella out of. Chidlren to use the option given to them to decide which material and represent back to the class why (Oracy).		1. Identify the four seasons using prompts (coat, sun cream, flowers) Identify and order the four seasons, recognising that they are cyclical. 2. Match scientific features to the season (colour of leaves, snow, sun, growth) Describe the features of the seasons, using scientific vocabulary. 3. Sort different clothing types into seasonal suitcases. Give reasons why certain clothes are better suited to different seasons and link this to changing weather types. 4. Through observation, during a local area walk in Winter, draw features associated with Winter. Through observation, during a local area walk in Spring, describe features associated with Spring. 5. With support, find information about weather associated with Spring. Use a range of sources to find information about weather associated with Spring.

		6. Observe and describe the weather changes over five days, e.g. sun, cloud, rain Record pictorially. Observe, record and compare findings of rainfall changes over five days, focusing on volume of water using simple methods of collecting and measuring rainfall.
Diversity Links		Seasons – Know about the climate in other countries around the world.
Vocabulary	Identify, materials, wood, plastic, glass, metal, rock, brick, paper, cardboard, uses, properties, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not bendy, absorbent, not absorbent, waterproof, not waterproof, transparent, , suitable, unsuitable, purpose.	Spring, summer, autumn, winter, hot, cold, rain, snow, cloud, weather, fog, ice, extremes, sun, mist

Year 1/2 CYCLE A	**Lent 2**	**Pentecost 1**	**Pentecost 2**
Topic	**Biology** Animals including humans	**Biology** Human Body	**Biology** Plants
Core Knowledge (National Curriculum)	• Know, identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Know, identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Know, describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). • Know, identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• 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.
Core knowledge	1. Know how to identify and name common animals, including fish, amphibians, reptiles, bird and mammals. Know how to identify and justify whether animals are a type of fish, amphibians, reptiles, birds and mammals.	1. Know which parts of our bodies we use for different activities. Know how to explain how body parts are used and move. 2. Know the five senses. Know how to describe the senses and which part of the body is related to each sense.	1. Know the names of common wild and garden plants. Know how to identify a variety of common wild and garden plants and describe the differences.

	2. Know how to identify the similarities and differences between some common animals. Know how to compare a variety of animals based on their physical characteristics. 3. Know that animals can be herbivores, carnivores or omnivores. Know that different animals have different diets: herbivores, carnivores and omnivores. Know how to identify and classify animals by their diet: herbivores, carnivores and omnivores. 4. Know how to identify the main parts of animals bodies. Know how to identify and explain the function of the main part of animal's bodies. 5. Know how to identify, name and label the basic parts of the body. Know how to locate and identify basic body parts on their own body. Know how to identify and describe the function of body parts on their body. 6. Know the body parts associated with each of the five senses. Know and explain the function of each body part in relation to the five senses.	Know and describe which part of the body is related to each sense and how we use them in everyday life. 3. Know we hear sounds with our ears and hearing is one of the senses. (Investigation lesson- investigate ideas about hearing by asking and extending questions and noticing patterns). 4. Know how to sort things using senses. Know we taste with our tongues. Know how to sort things using our senses. Know we taste with our tongues. Know how to sort things using our senses in a Venn diagram. 5. Know we have different ways of exploring the world and often our senses work together to help us to do that. Know and explain how our senses work together to explore the world.	2. Know and describe the basic structure of a flowering plant *(flower, stem, leaves, petal, roots)*. Know the structure of a variety of flowering plants and their basic function. 3. Know the names of a variety of trees and identify if they are deciduous or evergreen. Know the names of a variety of trees and explain the differences between them. 4. Know and describe the basic structure of trees *(roots, branches, trunk, leaves)*. Know and describe the structure of trees and their basic function. 5. Know the changes in deciduous trees throughout the four seasons and how to observe them. Know the changes in deciduous trees throughout the four seasons and compare to evergreen trees. *Enrichment – Children to plant seeds in Week 1 and observe throughout the half term.*
Wider Knowledge	• Know that fish live in water, have gills, scales and fins on their bodies. Know that they can be large and small. Know that mammals drink milk when they are a baby and have hair on their bodies. • Know that amphibians are born in water. Know that when they are born, they breathe with gills like fish. But when they grow up, they develop lungs and can live on land. • Know that reptiles have scaly skin. Know that they are cold-blooded and are born on land.	• Know there are four kinds of taste receptors on the tongue – bitter, sweet, salt and sour. • Know that we taste food using taste and smell.	• Know that plants are growing things. • Know that plants grow at different times of the year. • Know where to find plants in the local environment.

	• Know that birds have feathers and are born out of hard-shelled eggs. • Know what a similarity is – things that are the same • Know what a difference is – things that are different • Know that we can compare animals through their physical features, where they live, how they move, what they eat. • Know definition of nutrition – when we eat food and it gives us energy • Know the names for different body parts • Know that different parts of our bodies have different function (eyes – see, ears – hear, fingers – touch, noses – smell, tongue – taste)		
Skills	1. Match the picture of the animal to its name. Match the picture of the animal to the group (mammal, bird, fish, amphibian, reptile) it belongs to. Write the names of animals in the correct group. 2. Compare a group of animals and their features. 3. Write sentences next to pictures of animals which state whether the animal is an omnivore, herbivore or carnivore and give reasons why. 4. Label different parts of a picture of themselves, using key words. neck, leg, arm, head, chest, back, foot, hand, shoulder, fingers, toes, ears, eyes, nose, mouth, abdomen 5. Write sentences about senses. Describe what they have used their senses for. *I taste with my tongue. At lunchtime, I tasted my dinner using my tongue.*	2. Match up the sense to the body part. Complete the sentences with the correct body part. Using senses cards describe senses to partners and partners to guess. Complete the sentences with the correct body part or correct sense. 3. Create instructions for optimum hearing of the playground whistle, to demonstrate their learning and understanding. Create instructions for optimum hearing of the playground whistle, to demonstrate their learning and understanding using some scientific vocabulary *(e.g.* observe, changes, patterns, compare, record). 4. Identify and classify fruits and vegetables into groups using a sense. Classify fruits and vegetables using a Venn diagram using a sense. 5.Observe different things outside and describe what they smell like, look like and feel like. Experiment with having sight taken away and discuss the experience. Experiment using two senses together and the impact it has.	1. Identify and classify common wild and garden plants. Identify, describe and classify common wild and garden plants. 2. Make careful observations of a flowering plants and name the features. Make careful observations of a flowering plants, naming the features and their function. 3. Sort and classify deciduous and evergreen trees, recording data in a variety of ways (Y1 sorting table and Y2 pictogram or tally chart) 4. Make careful observations of a tree and name the features. Make careful observations of trees, naming their features and function. 5. Notice patterns and relationships between the time of year and the features of a deciduous tree. Notice patterns and relationships between the time of year and the features of a

	6. Print pictures of children and children to write similarities and differences. *I am a girl, he is a boy. He has black hair, I have brown hair.*		deciduous tree and compare to an evergreen tree.
Diversity Links	Protected Characteristics Race – Know that despite our differences on the outside, we all have God-given bodies and they should all be celebrated.		
Vocabulary	animal, herbivore, carnivore, omnivore, mammal, bird, fish, reptile, amphibian, similarities, differences, senses (hear, smell, taste, see/sight, touch/feel).	Senses, hear, smell, taste, touch, tongue, see, head, eyes, mouth, ears, shoulder, nose, chest, hands, fingers, knees, legs, toes, group, classify, feel.	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area

Year 3/4 CYCLE A	**Advent 1**	**Advent 2**	**Lent 1**
Topic	**Biology** Plants	**Physics** Light and Dark	Chemistry Rocks
National Curriculum	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • 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 • Investigate the way in which water is transported within plants • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change.	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter.
Core knowledge	1. Know the names of parts of a flowering plant and their function. Know the names of parts of a flowering plant and explain their function. 2. Know how to plan a fair experiment with a given research question, write a prediction	1. Know that we need light in order to see. Know how to describe and sort a variety of light sources. Know how to sort light sources and explain why and how they have been sorted. 2. Know how light from the Sun can be dangerous and how we can protect ourselves.	1.Know the three types of rock and how to group them based on their appearance. Know that what makes rocks different is how they were formed. 2. Know how to group different types of rocks based on physical properties. E.g. hard, soft, permeable & impermeable rocks.

	and method to find out what happens when one of requirements for healthy life is removed. Know how to plan a fair experiment, chose an appropriate research question, write a prediction and method to find out what happens when one of requirements for healthy life is removed. 3. Know how to record findings and write a conclusion (from lesson 2's experiment). Know how to record findings and write a conclusion giving reasons for findings (from lesson 2's experiment). 4. Know how water is transported within plants. Know how water is transported within plants using correct technical scientific language. 5. Know the order of the stages of the life cycle of a flowering plant. Know, order and understand the stage of the life cycle of a flowering plant. 6. Know the names of the different parts of the plant. Know their role in pollinating and fertilisation. Know the names of the different parts of the plant. Know and explain their role in pollinating and fertilisation.	Know about the benefits and dangers of being in the sun for too long. 3. Know what shadows are and why they are formed. Know how the position and size of a shadow changes in relation to the object and light source. 4. Know how the size of shadows change throughout the day. Know and explain why shadows change throughout the day. 5. Know how light is reflected from surfaces. Know that all objects reflect light to some degree. 6. Know how we use reflective materials in everyday life. Know and identify ways in which we use reflective surfaces.	Know what different rocks are used and give reasons for their use based on their properties. 3. Know that the Earth is made up of different layers of rocks and soils. Know that the Earth is made up of different layers, describe and classify them. 4. Know how to plan and carry out an investigation on different soils. Know how to identify types of soils. Know the properties of types of soils. 5. Know what a fossil is. Know how a fossil is formed when living things are trapped within rocks.
Wider Knowledge	Know the importance of plant for our world. Know plants give us oxygen. Know bees are essential for pollination.	Know how the eye detects light. Know a number of sources of light. Know which objects are not sources of light but reflect light. Know that light travels in a straight line.	Know the formation of igneous, sedimentary and metamorphic rocks (videos). Know that there are different types of soil. Know the components of soil. Know the importance of the job of worms in the soil system. Know that soil is typically found in layers.
Skills	1. Name the part of a flower matching. Draw a flowering plant labelling its part and explaining their function. 2. Plan an experiment which removes light (one of the essentials for plant life). Children to	• How to ask relevant questions and use different types of scientific enquiries to answer them.	1. Match descriptions to rocks to identify their names. Match descriptions to rocks to identify their name and how they were formed.

	write a prediction, fair test and the method. Plan an experiment which removes one of the requirements for healthy life of a plant- children choose the variable eg no water, or no light, not much soil, no warmth. And write their research question. Children to write a prediction, fair test and the method 3. Carry out a comparative investigation to find out whether temperature affects the speed that water is transported. (prior Show the children the pre-dyed flower. Discuss how it was dyed. How does this show the process of water transportation?) Complete differentiated Observing Changes Activity Sheet drawing a conclusion from results using scientific language correctly and drawing upon knowledge of the function of parts of the plant from previous lessons. 4. Watch video on flower and their role in pollinating and fertilation.to Use https://www.twinkl.co.uk/resource/t2-s-928-parts-of-a-flower-picture-hotspots to look at areas .Children to dissect a flowering plant and make an exploded diagram by sticking those part in and labelling parts and writing their role in pollinating and fertilisation. Children to dissect a plant and make an exploded diagram by sticking those part in and labelling the parts and **explaining** their role in pollinating and fertilisation. 5. Order of the stages of the life cycle of a flowering plant. Create a poster which explains the stage of the life cycle of a flowering plant with a glossary to show understanding of scientific vocabulary. 6. Observe findings from the experiment set up in week 2. Record finding in a table, write a conclusion. Record finding in a table, write a	• How to set up simple practical enquiries, comparative and fair tests. • How to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • How to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • How to gather, record, classify and present data in a variety of ways to help in answering questions. • How to identify differences, similarities or changes related to simple scientific ideas and processes. • How to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • How to use straightforward scientific evidence to answer questions or to support their findings. • How to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	2. Group different types of rocks based on given criteria. Observe and compare rocks, categorising them, justifying choices. 2. Plan, carry out and evaluate an experiment to compare the permeability of rocks. Make a simple prediction Make a simple prediction and give reasons why. 3. Identify the different layers of soils. Explain how soil is formed. 4. Identify the different layers that the Earth is made up of different layers of rocks and soils. Know that the Earth is made up of different layers and describe them. 5. Describe in simple terms how fossils are formed. Explain the fossilisation process, comparing fossils to the animals they belong to.

	conclusion which explains why the findings happened.		
Diversity Links			Rocks and soils – Look at Kusala Rajendran – an Asian female Scientist who studies earthquakes and their patterns.
Vocabulary	Roots, stems, trunk, petal, leaves, flower, anchor, nutrients, transport, seed carbon dioxide sunlight absorb, transport, stem, evaporate, compare, temperature, leaves, flower, observe, prediction, conclusion, filament anther sepal pollination requirements cycle.	Light, dark, shadow, block, source, opaque, transparent, translucent, reflect, reflector, reflection, surface, protect, travel, straight line, direction, distance, silhouette.	Fossil, soil, organic matter, topsoil, subsoil, base rock, cast fossils, trace fossils, permeable and impermeable. Hard, soft, slate, granite, chalk, marble, sandstone properties.

Year 3/4 CYCLE A	**Lent 2**	**Pentecost 1**	**Pentecost 2**
Topic	**Biology** Animals, including Humans	**Biology** Nutrition	**Physics** Forces and Magnets
National Curriculum	• Know and 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.	• 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.	• Compare how things move on different surfaces. • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • 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. • Describe magnets as having 2 poles. • Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

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Core Knowledge	1. Know the meaning of a vertebrate and invertebrate. Know how to identify vertebrate and invertebrates. 2. Know the meaning of an exoskeleton and an endoskeleton. Know the three types of skeleton (exoskeleton, endoskeleton and hydrostatic skeleton) and how to identify them. 3. Know that humans and animals have skeletons for support, protection and movement. Know humans and animals have skeletons for support, protection and movement (joints combined with muscles) and why they are important. 4. Know the names of the main bones in the human body. Know the names of the bones and identify them on a human and animal body. 5. Know how muscles allow movement and know pairs of muscles in the body. Know how muscles allow movement and know pairs of muscles in the body. 6. Know how to investigate an idea about how the human skeleton supports movement using a research question, fair test, prediction and conclusion. Know how to investigate an idea about how the human skeleton supports movement using a research question, prediction and conclusion giving reasons for findings.	1. Know that animals cannot make their own food, they get nutrition from what they eat. Know the different food groups and where they are found. Know the food groups, what they provide and where they are found. 2. Know that animals get nutrients from what they eat. Know that different animals require a different balance of nutrients. 3. Know the different nutrients that carnivores and herbivores need. Know that quantity of foods that make up certain animals' diet. 4. Know that humans need different amounts of nutrition. Know and explain why different humans need different amounts of nutrition. 5. Know how to investigate the amount of sugar in different fizzy drinks. Know how different ingredients affect our health.	1. Name different forces. Know when it is a pull or push force acting on an object. Know that there are different forces acting on an object. Identify the forces acting on an object. Know that some forces need contact between two objects. 2. Know that things move differently on surfaces due to friction. Know and explain why things move differently on different surfaces. 3. Know how to compare and group together materials according to whether they are magnetic. Know that magnetic forces can attract at a distance and attract some materials and not others. 4. Know magnets have two poles. Know whether two magnets will attract or repel each other, depending on which poles are facing. Know and explain whether two magnets will attract or repel each other and observe the effects. Know how to carry out an investigation using a research question about magnetic strength.
Wider Knowledge	• Identify that humans and some other animals have skeletons and muscles for suppose, protection and movement. • Know that not all animals have an internal skeleton. • Know that a skeleton is needed for support, protection and movement.	• Know herbivore, carnivore and omnivore (Revisit from Y1). • Know that humans need nutrients to grow. • Know that different cultures have different diets.	• Know magnets are used to help us. • Know Earth has a magnetic field. • Know Gravity is a force.

	• Know how muscles work.		
Skills	1. Identify vertebrate and invertebrate. Identify vertebrate and invertebrates discussing similarities, differences and patterns and reasons for these. 2. Sort animals into exoskeleton and endoskeleton groups. Sort animals according to their skeleton type. Write one advantage and one disadvantage for each type of skeleton. 3. Record the three reasons for humans and animals having skeletons. Explain the reasons for humans and animals having skeletons and the consequences if they did not. 4. Drawing around each other, children form the skeleton of the human body, identifying and naming the bones. Find and label the bones on the body using scientific language. Compare and label the skeleton of a human and a different type of animal. 5. Through enquiry predict which muscles used for a physical activity, test this and record finding. Through enquiry predict the muscles used for a physical activity, test this and record finding, explaining if prediction was correct and why. 6. Test the research question 'The bigger the femur the further one can jump' using a prediction, fair test and conclusion. Test the research question 'The bigger the femur the further one can jump' using a prediction, fair test and conclusion, choosing a format to show their findings e.g. bar chart and explanation.	1. Sort and classify foods into food groups and find out about the nutrients that different food provides. 2. Explore the nutritional values of different food by gathering information from food labels. 3. Investigate a range of pet foods and identify which nutrients animals require and why. Report on findings using a pie chart showing the quantity of the food/nutrition that make up the animal's diet. 4. Develop a week's food plan for humans with different requirements, e.g child, sportsman, office worker. (Y3 develop plate for themselves, Y4 develop plates for different humans). 5. Investigate the amount of sugar in different fizzy drinks and investigate whether a can floats or sinks and how they know this. Predict which drinks will have the most sugar and how they know this.	1. Identify if a force is a push or a pull. Identify forces acting on objects. Identify when forces needs contact between two objects. 2. Investigate how friction affects how far a toy car goes using different surfaces. Present their finding pictorially. Show their findings in a graph. 3. Classify and sort materials into magnetic and non – magnetic. Notice that magnetic forces can act at a distance. Compare and group material on whether they are magnetic or non – magnetic. 4. Predict and test whether magnets will attract or repel. 5. Carry out an investigation to find out the strength of different magnets using predictions and recording results. Carry out an investigation to find out the strength of different magnets explaining their findings.
Diversity Links	Marie M. Daly (1921–2003)-Chemist, Researcher and Activist Marie Daly was the first African-American woman to receive a Ph.D. in chemistry in the	Adelle Davis (1904 – 1974) was an American author and nutritionist, considered "the most famous nutritionist in the early to mid-20th	

	United States. Her work opened up a new understanding of how foods and diet can affect the health of the heart and the circulatory system	century." She was as an advocate for improved health through better nutrition.	
Vocabulary	Skeletons, vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton, support, protection, skull, brain, ribs, heart, lungs movement, joint, tendons, muscles, pull, contract, relax, bicep, tricep, clavicle scapula, humerus, ulna, vertebral column, pelvis, radius, femur, fibula, tibia.	starch, carbohydrates, fats, oils, dairy, protein, balanced, nutrition, energy, omnivore, carnivore, herbivore, consumer, predator, producer, prey.	pole, force, magnetic, magnetism, attract, repel, force, force meter, gravity natural, research, question, prediction, conclusion, variable, control, magnet, friction, retract

Year 5/6 CYCLE A	**Advent 1**	**Advent 2**	**Lent 1**
Topic	**Biology** Microorganism	**Biology** Plants	**Chemistry** Changes of materials
(National Curriculum)	• 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. • Give reasons for classifying plants and animals based on specific characteristics.	• Describe the life process of reproduction in some plants and animals. • Know about different types of reproduction, including sexual and asexual reproduction in plants.	• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • 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.
Core knowledge	1. Know and describe what a micro-organism is. Know and explain what a micro-organism is and examples. 2. Know bacteria, viruses and fungi are three different types of microbes. Know and explain different types of micro-organisms. 3. Know ways of distinguishing between organisms that have similar characteristics.	1. Know and describe the life process of reproduction in some plants. Know and explain the process of sexual reproduction in plants. 2. Know plants produce flowers which have male and female organs. Know seeds are formed when pollen from the male organ fertilises the ovum (female). 3. Know insects pollinate some flowers.	1. Know that some materials dissolve in a liquid to form a solution. Know that solutions have a saturation point. 2. Know that some dissolved substances can be recovered and this is a reversible change. Know methods of how to recover a dissolved substance from a solution. 3. Know that some materials are mixed and can be separated.

	Know ways of grouping organisms according to their characteristics. 4. Know micro-organisms are found everywhere. Know how and why micro-organisms can be helpful and harmful and the effects of micro-organisms. 5. Know micro-organism can help keep us healthy. Know how they can keep us healthy and how infections can spread. 6. Know how to carry out an investigation on what makes mould grow. Know how to plan and design and investigation thinking about the variables that can be changed.	Know and explain how insects pollinate flowers and how this is done. 4. Know seeds can be dispersed and the reasons why. Know and explain how seeds can be dispersed in a variety of ways. 5. Know the process of germination in a plant lifecycle. Know and explain the steps of germination: Imbibition, interim and radicle. 6. Know how to plan and carry out an investigation on seed dispersal. Know how to plan and design and investigation thinking about the variables that can be changed.	Know how mixtures might be separated through filtering and sieving. 4. Know how to plan an investigation to demonstrate that dissolving, mixing and changes of state can be reversible changes. 5. Know that some changes are irreversible, give examples. Know that some changes are irreversible, give examples and explain why it is a reversible or irreversible change. 6. Know that some changes result in the formation of new materials, Know that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Wider Knowledge	Know microbes generate at least 50% of the oxygen we breathe. Know mycoplasmas are the smallest known bacteria.	Know advantages and disadvantages of sexual and asexual reproduction. Know how a plant's features are adapted to pollination by insect or wind. Know that plants that reproduce asexually are genetically identical to the parent plant.	Know some examples of reversible and irreversible changes. Know that some materials dissolve in liquid to form solutions. Know how solids, liquids and gases mixtures might be separated, including through filtering, sieving and evaporating.
Skills	• Plan different types of scientific enquiries to answer questions, including recognising and • Control variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • How to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Identify scientific evidence that has been used to support or refute ideas or arguments	• Plan different types of scientific enquiries to answer questions, including recognising and • Control variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • How to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Identify scientific evidence that has been used to support or refute ideas or arguments	1. Dissolve materials in a liquid to form a solution. Record a solutions saturation point. *Dissolve sand, sugar, rice, flour, salt in water.* 2. Use the correct equipment to recover a dissolved substance from a solution (EVAPORATION). Predict how to recover a dissolved substance from a solution, based on scientific knowledge. Predict how to recover a dissolved substance from a solution, and explain why. 3. Separate mixtures using provided scientific equipment. Choose from a range of scientific equipment to separate mixtures.

	• Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Use test results to make predictions to set up further comparative and fair tests.	• Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Use test results to make predictions to set up further comparative and fair tests.	4. Identify the methods used to reverse the changes of dissolving (evaporation), mixing (magnets or sieving) and changes of state (melting or cooling). Identify the methods used and explain why using scientific vocabulary. 5. Describe changes which are irreversible. Describe which changes are irreversible and explain why it is a reversible or irreversible change.
Diversity Links			
Vocabulary	micro-organisms, fungi, bacteria, viruses	Pollination, pollinator, fertilisation, reproduction, germination, leaf, stem, roots, petals, light, soil, water, seed, bulb, temperature.	Solubility, conductivity, transparency, thermal, evaporation, dissolve, filtering, melting, separate, reversible reaction, irreversible, liquid, solution, substance, gases, sieving, evaporating.

Year 5/6 CYCLE A	**Lent 2**	**Pentecost 1**	**Pentecost 2**
Topic	**Physics** Forces	**Physics** Earth and Space	**Biology** Animal including humans - RSE
Core Knowledge (National Curriculum)	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Describe the movement of the Earth and other planets relative to the sun in the solar system. • Describe the movement of the moon relative to the Earth. • Describe the sun, Earth and moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	• Describe the changes as humans develop to old age.
Core knowledge	1. Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling objects.	1. Know the movement of the Earth and other planets relative to the Sun in the solar system.	1. Know the 6 stages of human development. Know and explain the 6 stages of human development.

	Know how to explain why unsupported objects fall towards the Earth. 2. Know that friction is a force that acts between two surfaces or objects that are moving. Know how to identify when friction is a useful and unhelpful force. Know the effect of friction between different surfaces. 3. Know how to investigate whose shoe has the greatest friction. Know how to independently plan an investigation to find out whose shoe has the greatest friction. 4. Know how to identify the effect of air resistance. Know how to investigate the effect of air resistance. 5. Know how to identify the effect of water resistance. Know how to explain that water resistance is a type of frictional force. 6. Know that a mechanism uses a smaller force to have a greater effect and change motion. Know how to identify gears, levers and pulleys and give everyday examples for each (Link to Y1/2 storybooks in DT). Know how to identify mechanisms, give examples in everyday life and explain how they work.	Know and explain the movement of the Earth and other planets relative to the Sun in the solar system using a diagram. 2. Know the movement of the moon relative to the Earth. Know the phases of the moon relative to the Earth. 3. Know the Sun, Earth and Moon as approximately spherical bodies. Know and explain how we know the Sun, Earth and Moon as approximately spherical bodies. 4. Know how to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Know how to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky by examining why the sun appears to move and the arguments for the Earth's rotation. 5. Know how to investigate night and day in different parts of the Earth. Know how to report and present findings from an enquiry. Know how to present findings verbally. Know how to present findings using a graph of choice.	2. Know how babies grow and develop in the womb. Know how to describe how babies grow and develop. Know how babies grow and develop by presenting data. 3. Know the changes as humans develop to old age by comparing the changes. Know the main changes that occur during puberty. Know and explain the changes that occur during puberty. 4. Know how to describe the changes that take place in old age. Know how to describe and explain the changes that take place in old age using scientific vocabulary. 5. Know how to report findings from enquiries in a written explanation in the context of the gestation period for animals. Know how to report findings from enquiries choosing how best to report my findings in the context of the gestation period for animals.
Wider Knowledge	1. Know that Sir Isaac Newton was the first person to describe force and movement in terms of mathematical relationships and universal 'laws' of motion. He did not invent or discover gravity, he was the first person to have enough knowledge to accurately describe gravity. Know that gravity is a force which acts at a distance. It is a pull force that pulls objects towards the centre of the Earth.	• Know Aristotle's reasoning and explanation of the Earth being round/spherical. • Know seasonal changes and how the length of the day varies. • Know space is (also known as outer space) is the area directly outside of the earth's atmosphere.	• Know that nutrients and food help aid growth. • Know that the rate of growth slows down in childhood but speed up in adolescence.

	Know that the standard unit of force is named after Sir Isaac Newton. Know how to plan a fair test. Know how to plan an investigation. 2. Know the definition of friction. Know that friction either acts between surfaces or between an object and a medium: it happens when things rub together, or when something moves through/over something else. Know that friction is a force that always resists movement. 3. Know how to plan an investigation . Know how to make it a fair test. 4. Know that air resistance is a force that acts in the opposite direction to gravity. It acts between a moving object and the air molecules around it, slowing the object down. Know that air resistance is a type of friction. Know that parachutes are used to increase air resistance and slow down a parachutist, so they can land safely. 5. Know the definition of water resistance. 6. Know that mechanisms are complex machines that change the input forces and motion into a desired output force and motion. EG: Bicycle – we sit an push the pedals moving our legs in a circular motion, these are our input forces and this drives us forward (linear motion) much faster (output), than we can run and with much less effort. Pulley – a wheel with a grooved rim around through which a cord passes. It acts to change the direction of a force applied to the cord and is used to raise heavy weights. They are used to us a small force to lift a large load. Gears – used to change speed, force or direction of motion. Gears are wheels with teeth, or indentations, which lock together and turn one another.	• Know there is no air in space.	

	Levers – used to help you use a small force to lift a large load. A level always rests on a pivot. Pivot – the central point on which a mechanism turns.		
Skills	1. Investigate, 'Do all objects fall at the same rate?' 2. Sort scenarios into friction and not a lot of friction. Explain when friction is useful and not useful. 3. Plan an investigation to find out how different shoes have different friction on different surfaces. 4. Explain the effect of air resistance and gravity on a scrunched up piece of paper and a flat piece of paper. 5. Identify the forces acting on a boat in water (gravity, upthrust/buoyancy, water resistance, power of boat – pushing it forward). Investigate the impact that shape has on water resistance. 6. Plan an investigation based on levers. How does the changing position of the pivot affect the amount of force required to lift the weight.	1. Use the information given to work out which planet is which, order the planets, number of days taken for each planet to complete one orbit of the sun to the nearest day and convert that time to earth years. 2. Using evidence that Aristotle discovered, explain that all planets are spherical. Explain what Earth would be like if it was cube or a pyramid. 3. Explain day and night and the apparent movement across the sky. Identify scientific evidence which does or does not provide evidence for an idea or argument. Investigate the differences between sunset and sunrise times.	1. Describe the changes as humans develop to old age by drawing a timeline to indicate the growth and development of humans. Describe and explain the changes as humans develop to old age by drawing a timeline to indicate the growth and development of humans. 2. Explain how a human foetus develops in the womb by drawing a graph to show the weight and length of the foetus at different weeks using a template provided. Record data and results using bar or line graph in the context of the growth of babies in height or weight in their first year after birth. 3. Identify on the human body the changes that happen during puberty on males and females. Explain why the changes happen during puberty. 4. Write an information text about becoming a senior describing and explaining the effects on teeth, fitness, bones and cells. 5. Predict and compare the gestation period of different types of vertebrates reporting findings in a written explanation. Predict and compare the gestation period of different types of vertebrates and invertebrate choosing how best to report findings.
Diversity Links		Mae Jemison – In 1992 Me became the first black women in Space.	

		Katherine Johnson (1918 – 2020) – Her calculations enabled humans to fly to Space, but her opportunities were limited as a black woman.	
Vocabulary	Force – a push or pull that acts upon an object that can cause it to move, change shape or change direction. Friction – the force that acts upon one surface when it moves against another. Gravity – a pull force that acts as a distance. Pull – to move something towards. Push – to move something away. Resistance – an opposing or slowing force Drag – the frictional force experienced by an object moving through a fluid or air. Streamlined – a shape which minimises the profile presented by an object in order to minimise the resistance it encounters when moving through a liquid or gas. Upthrust or buoyancy – the upward force exerted on a body by a fluid that surrounds it, equal and opposite to the weight of the water displaced. Newton (N) – the unit used to measure force. Gear – two wheels with serrated or notched rims that mesh together to transfer movement. Lever – usually a rigid bar with a pivot point close to one end, allowing movement at one end of the lever to be converted into a smaller movement at the other, which effectively magnifies the force applied. Pulley – a wheel with a grooved rim that allows the transfer of movement via a belt or band.	Earth, planet, Sun, moon, spherical, rotate, rotation, spin, night, day, orbit, elliptical, crater, lunar, phase, satellite, axis, solar system, universe, opinion, fact, support, refute and planet names.	Puberty, life cycle, foetus, baby, child, adolescent, adult, reproduce, gestation period, vertebrate, invertebrate, senior, growth, development