



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Within our curriculum, we ensure all children are prepared for life, with the skills they need to achieve, aspire and accomplish both academically, emotionally, spiritually and creatively, regardless of their faith, creed or race; meeting every child's potential and their needs. At English Martyrs' this includes meeting the needs of a very mixed community representing a broad range of faiths, ethnicities, creeds and socio-economic circumstances: a significant proportion of children with high needs and are disadvantaged; children living in high social deprivation, asylum seekers, vulnerable children and families who seek security and safety in our school family.

Our intent is for learning without barriers so that all children can succeed.

Our Intent is to meet these needs in Science by...

- ...providing exciting opportunities for children to explore their Scientific talents.
- ...provide the cultural capital needed so that children are well placed for future positive outcomes.
- ...providing all children with bespoke and tailored opportunities to ensure their Scientific needs are met regardless of starting point.
- ...developing children's skills in scientific enquiry and exploration from the outset.
- ...giving opportunities to use Science across the curriculum at all stages and phases.
- ...providing bespoke, exciting and engaging activities, projects and experiences for children to explore scientifically, including the use of digital technologies to support their learning and enjoyment.
- ...providing challenge for all so that all children have the opportunity to reach their potential.
- ...providing opportunities to share knowledge, skill and understanding of basic with others.
- ...using the wider community and environment to develop scientific skill, knowledge and understanding.
- ...providing a variety of mediums to explore the world in order to enhance learning and understanding.
- ...providing tailored support for children at all standards in development so that they can thrive.
- ...providing a range of opportunities for children to experience the living world.
- ...providing all children with a bespoke and tailored curriculum to meet their individual needs, including in Blended Learning.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Intent ~ By the end of EYFS, we want children to...

Understanding the World: The World

ELG

- 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.

Term	Spring Term 2 New Life	Spring Term 2 New Life
Area of Science Curriculum / Implementation	Understanding the World Working Scientifically ~ Explore/Observe, Describe & Record Animals and Plants	Understanding the World Working Scientifically ~ Research, Describe, Questioning
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Observe different animals and plants ➤ Know the names of basic plants and animals ➤ Talk about what they notice and see ➤ Draw pictures of animals in Nursery ~ Caterpillars, Ducklings	➤ Decide questions to ask on field trip ➤ Observe life cycles ➤ Be curious and interested in the natural world ➤ Ask questions about plant and animals and their life cycles
Term	Summer Term 1 People Who Help Us	Summer Term 1 People Who Help Us
Area of Science Curriculum / Implementation	Understanding the World Working Scientifically ~ Research, Vocabulary & Compare/Sort/Group/Identify	Understanding the World Working Scientifically ~ Explain, Describe, Vocabulary & Compare/Sort/Group/Identify
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Talk to the visitors in the setting ➤ Think about and ask questions to find out about their jobs ➤ Name and describe visitors' tools and equipment ➤ Compare/sort/group/identify what the police/fire/nurse may use and need for their jobs	➤ Talk about why we brush our teeth and what happens when we don't ➤ Talk about what they notice based on real life experiences or books read to them based on a dentist ➤ Use language to name and describe visitors' tools and equipment ➤ Sort and group objects for the relative job



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Term	Summer Term 2 Hear me Roar!	Summer Term 2 Hear me Roar!
Area of Science Curriculum / Implementation	Understanding the World Working Scientifically	Understanding the World ➤ Working Scientifically
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Sort/group/identify different dinosaurs into meat and leaf eaters ➤ Sort/group/identify different dinosaurs into height ➤ Recognise different characteristics of different dinosaurs	➤ Sort/group/identify different dinosaurs into meat and leaf eaters ➤ Sort/group/identify different dinosaurs into height ➤ Recognise different characteristics of different dinosaurs



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

KS1

Intent (National Curriculum) ~ We want children...

- To ask simple questions and recognise that they can be answered in different ways
- To observe closely, using simple equipment
- To perform simple tasks
- To identify and classify
- To use their observations and ideas to suggest answers to questions
- To gather and record data to help in answering questions
- To explore the world around them and raise their own questions
- To experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions
- To use simple features to compare objects, materials and living things and with help, decide how to sort and group them, observe change over time and with guidance to notice patterns and relationships
- To ask people questions and use simple secondary sources to find answers
- To use simple measurements and equipment to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out.
- To record and communicate, with help, findings in a range of ways and begin to use simple scientific language

	Year 1	Year 2
Term	Autumn Term 1	Autumn Term 1
Area of Science Curriculum / Implementation	Animals ~ Other Animals	Living Things & Their Habitats and Animals Growth and Survival Environment
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Identify and name a variety of common animals including some fish, some amphibians, some reptiles, some birds and some mammals. ➤ Identify and name a variety of common animals that are carnivores, herbivores and omnivores (according to what they eat.) ➤ Describe and compare the structure of a variety of common animals(fish, amphibians, reptiles, birds and mammals, and including pets). ➤ Find out and describe how animals look different to one another. ➤ Group together animals according to their different features. ➤ Recognise similarities between animals:	Habitats ➤ 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 micro-habitats. ➤ Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. ➤ Different kinds of plants and animals live in different kinds of places.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

	➤ Structure: head, body, way of moving, senses, body covering, tail. ➤ Animals have senses to explore the world around them and to help them to survive. ➤ Recognise that animals need to be treated with care and sensitivity to keep them alive and healthy. ➤ Animals are alive; they move, feed, grow, use their senses and reproduce.	➤ Habitats provide the preferred conditions for the animals/plants that live there (compare local habitats and less familiar examples). Animal Growth and Survival ➤ Notice that animals, have offspring which grow into adults. ➤ Find out about and describe the basic needs of animals, for survival (water, food and air).
Working Scientifically by	➤ Compare and contrast animals at first hand or through videos and photographs. ➤ Describing how they identify and group them. ➤ Grouping animals according to what they eat. ➤ Using their senses.	➤ Constructing a simple food chain that includes humans (e.g. grass, cow, human). ➤ Observing, through video or first-hand observation and measurement, how different animals grow; ➤ Asking questions about what things animals need for survival suggesting ways to find answers to their questions.
Term	Autumn Term 2	Autumn Term 2
Area of Science Curriculum / Implementation	Animals ~ Humans	Living Things & Their Habitats and Animals Growth and Survival
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. ➤ Recognise that humans are animals. ➤ Compare and describe differences in their own features (eye, hair, skin colour, etc.). ➤ Recognise that humans have many similarities.	Habitats ➤ Explore and compare the differences between things that are living, dead, and things that have never been alive. ➤ There are different kinds of habitat near school which need to be cared for ➤ Habitats provide the preferred conditions for the animals/plants that live there (compare local habitats and less familiar examples). ➤ Sorting and classifying things as to whether they are living, dead or were never alive. ➤ Recording their findings using charts ➤ Describing how they decided where to place things, ➤ Exploring questions such as: 'Is a flame alive? Is a deciduous tree dead in winter?' ➤ Talking about ways of answering their questions. ➤ Constructing a simple food chain that includes humans (e.g. grass, cow, human);



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

		➤ Describing the conditions in different habitats and micro-habitats (under log, on stony path, under bushes); ➤ Finding out how the conditions affect the number and type(s) of plants and animals that live there. ➤ Compare and contrast... a variety of things - focusing on the similarities as well as the differences] including how different things change over different periods of time (objects, materials or living things). ➤ Sort and classify things according to a variety of different features (e.g. "I know it is living because it .. and it...). Animals Growth and Survival ➤ Notice that animals, have offspring which grow into adults. ➤ Find out about and describe the basic needs of animals, for survival (water, food and air).
Working Scientifically by	➤ Compare and contrast animals (humans) at first hand or through videos and photographs. ➤ Using their senses to compare different textures, sounds and smells.	➤ Observing, through video or first-hand observation and measurement, how different animals grow; ➤ Asking questions about what things animals need for survival suggesting ways to find answers to their questions.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Term	Spring Term 1	Spring Term 1
Area of Science Curriculum / Implementation	Materials and Their Properties~ Everyday Materials	Animals including Humans
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ 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, rock, brick, paper and cardboard. ➤ 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.	➤ Notice that animals, have offspring which grow into adults. ➤ Find out about and describe the basic needs of animals, for survival (water, food and air). ➤ Notice that humans, have offspring which grow into adults. ➤ Find out about and describe the basic needs of 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. ➤ Medicines can be useful when we are ill. ➤ Medicines can be harmful if not used properly.
Working Scientifically by	➤ Performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	➤ Observing, through video or first-hand observation and measurement, how humans grow. ➤ Recording their findings using charts. ➤ Asking questions about what things animals need for survival and what humans need to stay healthy. ➤ Suggesting ways to find answers to their questions.
Term	Spring Term 2	Spring Term 2
Area of Science Curriculum / Implementation	Light & Astronomy ~ Seasons & Weather (Spring) ~ Environment	Materials
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Observe and describe changes across the four seasons. ➤ Observe and describe weather associated with the seasons and how day length and temperature varies. ➤ Making tables and charts about the weather ➤ Making displays of what happens in the world around them, including day length, as the seasons change.	➤ 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 ➤ Some materials can be found naturally; others have to be made.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

		➤ Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); ➤ Observing closely, ➤ Identifying and classifying the uses of different materials, and ➤ Recording their observations. ➤ Thinking about unusual and creative uses for everyday materials.
--	--	--

Term	Summer Term 1 & 2	Summer Term 1
Area of Science Curriculum / Implementation	Plants ~ Common Names and Basic Structures Seasons ~ Summer	Plants
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ 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 (at least: flower, leaf, root, stem, trunk, seed, branch and petal).	➤ 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. ➤ Plants are living and eventually die. ➤ Working Scientifically
Working Scientifically by	➤ Observing closely, perhaps using magnifying glasses. ➤ Comparing and contrasting familiar plants. ➤ Describing how they were able to identify and group them, and ➤ Drawing diagrams showing the parts of different plants including trees. ➤ Keeping records of how plants have changed over time, for example the leaves falling off trees and buds opening. ➤ Comparing and contrasting what they have found out about different plants.	➤ Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or ➤ Observing similar plants at different stages of growth; ➤ Setting up a comparative test to show that plants need light and water to stay healthy.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Term		Summer Term 2
Area of Science Curriculum / Implementation		Plants ~ Scientists and the Environment
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...		➤ To identify and classify by sorting litter into recycling groups based on their materials. ➤ Sort items for recycling based on their materials. To use their observations and ideas to suggest answers to questions by suggesting ways that waste can be reduced, reused and recycled. ➤ Suggest ways we can reduce, reuse and recycle. ➤ Use observations and ideas to answer questions by thinking of ways to persuade people to use less energy. ➤ Ask simple questions and recognise that they can be answered in different ways by researching the rainforest. ➤ Ask and answer questions about the rainforest. To identify and classify by sorting rainforest animals into animal classification groups. ➤ Identify and classify rainforest animals. ➤ Ask simple questions and recognise that they can be answered in different ways by asking and answering questions about endangered animals. ➤ Ask and answer questions about endangered animals.
Working Scientifically by		➤ Performing simple tests, by investigating how much water can be saved by turning off the tap while washing hands. ➤ Set up a test and record the results. Observe closely, using simple equipment by measuring the different amounts of water used. ➤ Accurately measure water and record my measurements. ➤ Work in a group to investigate the answer to a question. Gathering and recording data to help in answering questions by taking surveys. ➤ Take surveys and use the information to help answer a question.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

LKS2

Intent (National Curriculum) ~ We want children...

- To broaden their scientific view of the world around them
- To explore, talk about, rest and develop ideas about everyday phenomena and the relationships between living things and familiar environments
- To develop their ideas about functions, relationship and interactions
- To ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them
- To observe changes over time, notice patterns, group and classify things, carry out simple comparative and fair tests and find things out using secondary sources of information
- To draw simple conclusions and use some scientific language, first, to talk about, and later, to write about what they have found out.
- To read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

	Year 3	Year 4
Term	Autumn Term 1	Autumn Term 1
Area of Science Curriculum / Implementation	Light & Astronomy	Living Things & Their Habitats
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ 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 a solid object. ➤ Find patterns in the way that the size of shadows can change.	➤ Recognise that living things can be grouped in a variety of ways. ➤ Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. ➤ Recognise that environments can change and that this can sometimes pose dangers to living things. ➤ Use and make identification keys for plants and animals.
Working Scientifically by	➤ Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	➤ Using and making simple guides or keys [grouping & classifying] to explore and identify local plants and animals. ➤ Making a guide [grouping & classifying] to local living things. ➤ Raising and answering questions based on their observations of animals ➤ What they have found out about other animals that they have researched.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Autumn Term 2	Autumn Term 2
Area of Science Curriculum / Implementation	Material Properties ~ Rocks, Fossils & Soils	Sound
Impact Knowledge By the end of the unit our children will know and be able to...	➤ 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 ➤ Recognise that rocks and soils can feel and look different. ➤ Recognise that rocks and soils can be different in different places/environments.	➤ Vibrations ➤ Identify how sounds are made, associating some of them with something vibrating. ➤ Recognise that vibrations from sounds travel through a medium to the ear. ➤ Find patterns between the volume of a sound and the strength of the vibrations that produced it. ➤ Recognise that sounds get fainter as the distance from the sound source increases. ➤ Recognise that sounds can be made in a variety of ways (pluck, bang, shake, blow) using a variety of things (instruments, everyday materials, body). ➤ Sounds travel away from their source in all directions. ➤ Vibrations may not always be visible to the naked eye. ➤ Pitch ➤ Find patterns between the pitch of a sound and features of the object that produced it. ➤ Sounds can be high or low pitched. ➤ The pitch of a sound can be altered. ➤ Pitch can be altered either by changing the material, tension, thickness or length of vibrating objects or changing the length of a vibrating air column. ➤ Muffling/blocking sounds ➤ Recognise that vibrations from sounds travel through a medium to the ear. ➤ Sounds are heard when they enter our ears (although the structure of the ear is not important key learning at this age phase). ➤ Sounds can travel through solids, liquids and air/gas by making the materials vibrate. ➤ Sound travel can be reduced by changing the material that the vibrations travel through. ➤ Sound travel can be blocked.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Working Scientifically by	➤ Observing rocks, including those used in buildings and gravestones. ➤ Exploring how and why they might have changed over time. ➤ Using (equipment) a hand lens or microscope to help them. ➤ Identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. ➤ Research and discuss the different kinds of living things whose fossils are found in sedimentary rock. ➤ Explore how fossils are formed. ➤ Explore different soils and Identify similarities and differences between them and describe the composition of soil. ➤ Investigate what happens when rocks are rubbed together (classify according to hardness) or what changes occur when they are in water. ➤ Raise and answer questions about the way soils are formed.	➤ Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. ➤ They might make ear muffs from a variety of different materials to investigate /test which provides the best insulation against sound. ➤ They could make [create/invent/design] and play their own instruments by using what they have found out about pitch and volume.
----------------------------------	--	--



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Term	Spring Term 1	Spring Term 1
Area of Science Curriculum / Implementation	Forces & Magnets	Electricity
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Compare how some things move on different surfaces. ➤ Notice that some forces need contact between two 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 two poles (like and unlike poles). ➤ Predict whether two magnets will attract or repel each other, depending on which poles are facing.	➤ Identify common appliances that run on electricity. ➤ Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ➤ Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. ➤ Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ➤ Recognise some common conductors and insulators, and associate metals with being good conductors. ➤ Electricity can be dangerous. ➤ Electricity sources can be mains or battery. ➤ Batteries 'push' electricity round a circuit and can make bulbs, buzzers and motors work. ➤ Faults in circuits can be found by methodically testing connections. ➤ Drawings, photographs and diagrams can be used to represent circuits (although standard symbols need not be introduced until UKS2).
Working Scientifically by	➤ Comparing how different things move and grouping them. ➤ Raising questions and carrying out tests to find out how far things move on different surfaces. ➤ Gathering and recording data to find answers to their questions. ➤ Exploring the strengths of different magnets and finding a fair way to compare them. ➤ Sorting materials into those that are magnetic and those that are not. ➤ Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another. ➤ Identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.	➤ Observing/noticing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Spring Term 2	Spring Term 2
Area of Science Curriculum / Implementation	Animals ~ Health/Nutrition	Electricity
Impact Knowledge By the end of the unit our children will know and be able 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. ➤ An adequate and varied diet is beneficial to health (along with a good supply of air and clean water). ➤ Regular and varied exercise <i>from a variety of different activities</i> is beneficial to health (focus on <i>energy in versus energy out</i>. Include information on making informed choices).	➤ Identify common appliances that run on electricity. ➤ Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ➤ Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. ➤ Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ➤ Recognise some common conductors and insulators, and associate metals with being good conductors. ➤ Electricity can be dangerous. ➤ Electricity sources can be mains or battery. ➤ Batteries 'push' electricity round a circuit and can make bulbs, buzzers and motors work. ➤ Faults in circuits can be found by methodically testing connections. ➤ Drawings, photographs and diagrams can be used to represent circuits (although standard symbols need not be introduced until UKS2).
Working Scientifically by	➤ Comparing and contrasting the diets of different animals (including their pets). ➤ Decide ways of grouping them according to what they eat. ➤ Researching different food groups and how they keep us healthy. ➤ Designing meals based (Create / Invent/ Design) on what they find out.	➤ Observing/noticing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

Term	Summer Term 1	Summer Term 1
Area of Science Curriculum / Implementation	Animals ~ Skeletons & Movement	States of Matter
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Identify that humans and some other animals have skeletons and muscles for support, protection and movement. ➤ Identify animals (vertebrates) which have a skeleton which supports their body, aids movement & protects vital organs (e.g. name and locate skull, backbone, ribs, bones for movement/limbs, pelvis and be able to name some of the vital organs protected). ➤ Identify animals without internal skeletons/backbones (invertebrates) and describe how they have adapted other ways to support themselves, move & protect their vital organs. ➤ Know how the skeletons of birds, mammals, fish, amphibians or reptiles are similar (backbone, ribs, skull, bones used for movement) and the differences in their skeletons. ➤ Know that muscles, which are attached to the skeleton, help animals move parts of their body. ➤ Explore how humans grow bigger as they reach maturity by making comparisons linked to body proportions and skeleton growth – e.g. do people with longer legs have longer arm spans? ➤ Recognise that animals are alive; they move, feed, grow, use their senses and reproduce.	➤ Compare and group materials together, according to whether they are solids, liquids or gases. ➤ Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). ➤ Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. ➤ Solids, liquids and gases can be identified by their observable properties. ➤ Solids have a fixed size and shape (the size and shape can be changed but it remains the same after the action). ➤ Liquids can pour and take the shape of the container in which they are put. ➤ Liquids form a pool not a pile. ➤ Solids in the form of powders can pour as if they were liquids but make a pile not a pool. ➤ Gases fill the container in which they are put. ➤ Gases escape from an unsealed container. ➤ Gases can be made smaller by squeezing/pressure. ➤ Liquids and gases can flow.
Working Scientifically by	➤ Identifying and grouping animals with and without skeletons. ➤ Observing and comparing their movement. ➤ Exploring ideas about what would happen if humans did not have skeletons.	➤ Grouping and classifying a variety of different materials. ➤ Exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). ➤ Researching the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. ➤ Observing and recording evaporation over a period of time, such as a puddle in the playground or washing on a line. ➤ Investigating the effect of temperature on washing drying or snowmen melting. ➤ Using data logging equipment to detect/measure and compare temperatures.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Summer Term 2	Summer Term 2
Area of Science Curriculum / Implementation	Living Things & Their Habitats	Teeth, Eating & Digestion
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Identify, locate 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. ➤ Roots grow downwards and anchor the plant. ➤ Water, taken in by the roots, goes up the stem to the leaves, flowers and fruit. ➤ Nutrients (not food) are taken in through the roots. ➤ Stems provide support and enable the plant to grow towards the light. ➤ Plants make their own food in the leaves using energy from the sun. ➤ Flowers attract insects to aid pollination. ➤ Pollination is when pollen is transferred between plants by insects, birds, other animals and the wind. ➤ Seeds are formed after the flowers are pollinated. ➤ Many flowers produce fruits which protect the seed and/or aid seed dispersal. ➤ Seed dispersal, by a variety of methods, helps ensure that new plants survive. ➤ Plants need nutrients to grow healthily (either naturally from the soil or from fertiliser added to soil).	➤ Describe the simple functions of the basic parts of the digestive system in humans. ➤ Identify the different types of teeth in humans and their simple functions. ➤ Construct and interpret a variety of food chains, identifying producers, predators and prey <i>(NB Link with types of teeth and eating in this unit but this concept could be developed further in the yr4 Environment / habitats unit)</i>. ➤ _Describe how teeth and gums have to be cared for in order to keep them healthy.
Working Scientifically by	➤ Comparing the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser; ➤ Discovering (research and modelling) how seeds are formed by ➤ Observing the different stages of plant cycles over a period of time; ➤ Looking for patterns in the structure of fruits that relate to how the seeds are dispersed. ➤ Observing how water is transported in plants, for example, by putting cut, white carnations into coloured water. ➤ Observing how water travels up the stem to the flowers.	➤ Comparing the teeth of carnivores and herbivores. ➤ Suggesting reasons for differences [grouping & classifying]. ➤ Finding out [testing and/or researching] what damages teeth and how to look after them. ➤ Drawing and discussing their ideas about the digestive system. ➤ Comparing them with models or images.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

UKS2

Intent (National Curriculum) ~ We want children...

- To develop a deeper understanding of a wide range of scientific ideas
- To explore and talk about their ideas; ask their own questions about scientific phenomena; and analyse functions, relationships and interactions more systematically
- To encounter more abstract ideas and begin to recognise that scientific ideas change and develop over time
- To select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair test and finding things out using a wide range of secondary sources of information
- To draw conclusions based on their data and observations, use evidence to justify their ideas and use their scientific knowledge and understanding to explain their findings
- To read, spell and pronounce scientific vocabulary correctly

	Year 5	Year 6
Term	Autumn Term 1	Autumn Term 1
Area of Science Curriculum / Implementation	Material Properties ~ Testing Material Properties	Animals including Humans ~ Exercise, Health & The Circulatory System
Impact Knowledge By the end of the unit our children will <i>know</i> and be able 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. ➤ Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic (advantages and disadvantages). ➤ Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, solubility, transparency, thermal conductivity, electrical conductivity). ➤ Temperature and Thermal Insulation ➤ Heat always moves from hot to cold. ➤ Some materials (insulators) are better at slowing down the movement of heat than others. ➤ Objects/liquids will warm up or cool down until they reach the temperature of their surroundings.	➤ Describe the functions of the heart, blood vessels and blood. ➤ Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (in the long term and short term). ➤ Describe the ways in which nutrients and water are transported within animals, including humans. ➤ The heart is a major organ and is made of muscle. ➤ The heart pumps blood around the body through vessels and this can be felt as a pulse. ➤ The heart pumps blood through the lungs in order to obtain a supply of oxygen. ➤ Blood carries oxygen/essential materials to different parts of the body. ➤ During exercise muscles need more oxygen so the heart beats faster and our breathing and pulse rates increase. ➤ Animals are alive; they move, feed, grow, use their senses, reproduce, breathe/respire and excrete. ➤ An adequate, varied and balanced diet is needed to help us grow and repair our bodies (proteins), provide us with energy (fats and carbohydrates) and maintain good health (vitamins and minerals). ➤ Tobacco, alcohol and other 'drugs' can be harmful.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

		➤ All medicines are drugs, not all drugs are medicines.
Working Scientifically by	➤ Carry out tests to answer questions such as 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' ➤ Compare materials in order to make a switch in a circuit.	➤ Exploring the work of scientists ➤ Scientific research about the relationship between diet, exercise, drugs, lifestyle and health. ➤ Additional suggestion beyond NC2014 to support pupils working scientifically and to provide an opportunity to use ICT to collect/interpret data ➤ Observing/Measuring changes to breathing, heart beat and or pulse rate after exercise.

Term	Autumn Term 2	Autumn Term 2
Area of Science Curriculum / Implementation	Material Changes ~ Reversible & Irreversible Changes	Astronomy & Light How Light Travels
Impact Knowledge By the end of the unit our children will know and be able to...	➤ Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. ➤ Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ➤ Demonstrate that dissolving, mixing and changes of state are reversible changes. ➤ Changes can occur when different materials are mixed. ➤ Some material changes can be reversed and some cannot. ➤ Recognise that dissolving is a reversible change and recognise everyday situations where dissolving occurs. ➤ Distinguish between melting and dissolving. ➤ Mixtures of solids (of different particle size) can be separated by sieving. ➤ Mixtures of solids and liquids can be separated by filtering if the solid is insoluble (un-dissolved). ➤ Evaporation helps us separate soluble materials from water.	➤ Recognise that light appears to travel in straight lines. ➤ Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. ➤ Explain that we see things because the light that travels from light sources to our eyes or from light sources to objects and then to our eyes (and represent this in simple diagrammatic form). ➤ Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill

Science

	➤ Changes to materials can happen at different rates (factors affecting dissolving, factors affecting evaporation – amount of liquid, temperature, wind speed, etc). ➤ Freezing, melting and boiling changes can be reversed (revision from YR4). ➤ 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 (producing a gas / fizzing).	
Working Scientifically by	➤ Observing and comparing the changes that take place, for example, when burning different materials or baking bread or cakes. ➤ Researching and discussing how chemical changes have an impact on our lives, for example cooking. ➤ Discuss [research] the creative use of new materials such as polymers, super-sticky and super-thin materials. ➤ Explain how they know when a change is reversible or irreversible	➤ Deciding [observe/explore] where to place rear-view mirrors on cars. ➤ Designing and making [Create / Invent / Design] a periscope and using the idea that light appears to travel in straight lines to explain how it works. ➤ Investigating the relationship [looking for patterns] between light sources, objects and shadows by using shadow puppets. ➤ Extend their experience [explore and observe] of light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters(they do not need to explain why these phenomena occur).



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Spring Term 1	Spring Term 1
Area of Science Curriculum / Implementation	Light & Astronomy ~ Earth & Space	Electricity
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Describe the movement of the Earth, and other planets, relative to the Sun and each other in the solar system. ➤ Describe the movement of the Moon relative to the Earth. ➤ Describe Sun/Earth/Moon as approximately spherical bodies. ➤ Use the idea of the Earth's rotation to explain day and night. ➤ The Earth spins once around its own axis in 24 hours, giving day and night. ➤ The Earth orbits the Sun in one year. ➤ We can see the Moon because the Sun's light reflects off it. ➤ The Moon orbits the Earth in approximately 28 days and changes to the appearance of the moon are evidence of this. ➤ Use the Earth's movement in space to explain the apparent movement of the sun across the sky. ➤ The Sun appears to move across the sky from East to West and this causes shadows to change during the day. ➤ Changes to shadow length over a day or changes to sunrise and sunset times over a year are evidence supporting the movement of the Earth.	➤ Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. ➤ Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. ➤ Use recognised symbols (at least: cells, wires, switches, bulbs, buzzers and motors) when representing a simple circuit in a diagram. ➤ Use/interpret circuit diagrams to construct a variety of more complex circuits predicting whether they will 'work'.
Working Scientifically by	➤ Comparing the time of day at different places on the Earth through internet links and direct communication. ➤ Creating simple models of the solar system. ➤ Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day. ➤ Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.	➤ Systematically identifying [testing] the effect of changing one [thing] component at a time in a circuit. ➤ Designing and making [Create / Invent / Design] a set of traffic lights, a burglar alarm or some other useful circuit.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Spring Term 2	Spring Term 2
Area of Science Curriculum / Implementation	Forces ~ Effects on Movement	Electricity
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ 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 (causing things to slow down) ➤ Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. ➤ There are different types of forces (push, pull, friction, air resistance, water resistance, magnetic forces, gravity) which have different effects on objects ➤ Gravity can act without direct contact between the Earth and an object. ➤ Friction, air resistance and water resistance can be useful or unwanted. ➤ The effects of friction, air resistance and water resistance can be reduced or increased for a preferred effect. ➤ More than one force can act on an object simultaneously (either reinforcing or opposing each other).	➤ Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. ➤ Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. ➤ Use recognised symbols (at least: cells, wires, switches, bulbs, buzzers and motors) when representing a simple circuit in a diagram. ➤ Use/interpret circuit diagrams to construct a variety of more complex circuits predicting whether they will 'work'.
Working Scientifically by	➤ Exploring falling paper cones or cup-cake cases. ➤ Designing and making [exploring] a variety of parachutes. ➤ Carrying out fair tests to determine which designs are the most effective. ➤ Exploring resistance in water by making and testing boats of different shapes. ➤ Design and make [create/invent/design] artefacts that use simple levers, pulleys, gears and/or springs and explore their effects.	➤ Systematically identifying [testing] the effect of changing one [thing] component at a time in a circuit. ➤ Designing and making [Create / Invent / Design] a set of traffic lights, a burglar alarm or some other useful circuit.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Summer Term 1	Summer Term 1
Area of Science Curriculum / Implementation	Reproduction	Evolution & Inheritance
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. ➤ Describe the life process of reproduction in some plants and animals. ➤ Name, locate and describe the functions of the main parts of reproductive system of plants (stigma, stamen, petal, sepal, pollen, ovary)	➤ Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ➤ Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ➤ Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Working Scientifically by	➤ Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times). ➤ Asking pertinent questions. ➤ Suggesting reasons for similarities & differences [grouping and classifying]. ➤ They might try to [explore] grow new plants from different parts of the parent plant, for e.g., seeds, stem & root cuttings, tubers, bulbs. ➤ Observe changes in an animal over a period of time (for example, by hatching & rearing chicks). ➤ Comparing how different animals reproduce and grow.	➤ Observing and raising questions about local animals and how they are adapted to the environment. ➤ Comparing how some living things adapt to survive in extreme conditions, e.g. cactuses, penguins and camels. ➤ Analysing the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.



English Martyrs' Catholic Primary School Progression of Knowledge and Skill
Science

Term	Summer Term 2	Summer Term 2
Area of Science Curriculum / Implementation	Animals ~ Human Lifecycles	Living Things and their Habitats ~ Classification
Impact Knowledge By the end of the unit our children will <i>know</i> and be able to...	➤ Describe the changes as humans develop to old age. ➤ Animals are alive; they move, feed, grow, use their senses, reproduce, breathe/respire and excrete.	➤ 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. ➤ Living things can be grouped into micro-organisms, plants and animals. ➤ Vertebrates can be grouped as fish, amphibians, reptiles, birds and mammals. ➤ Invertebrates can be grouped as snails and slugs, worms, spiders and insects. ➤ Plants can be grouped as flowering plants (incl. trees and grasses) and non-flowering plants (such as ferns and mosses).
Working Scientifically by	➤ Researching the gestation periods other animals and comparing them with humans. ➤ By finding out and recording the length and mass of a baby as it grows.	➤ Using classification systems and keys. ➤ Identifying [grouping & classifying] some animals and plants in the immediate environment. ➤ Researching unfamiliar animals & plants from a broad range of other habitats & decide where they belong in the classification system [grouping & classifying].