We speak the language of Science

By the time they leave, pupils will:

- Have a positive attitude to, and interest in, science
- Plan and carry out range of scientific enquiries that combine detailed observation, research and fair-testing
- Plan different types of scientific investigations, explaining the variables that will remain constant, and the impact this will have on the investigation
- Ask questions and seek answers through collecting, analysing and presenting data
- Make their own decisions about what observations to make, the measurements that will be made, how long to make them for and whether they should be repeated
- Use a wide range of scientific vocabulary and technical terminology accurately and precisely
- Have good scientific knowledge of: seasonal changes; animals, including humans; plants; living things and their habitats; materials; sound, light; electricity; forces; rocks; earth and space

EYFS links

Understanding the World

- Explore the natural world around them
- Describe what they see, hear and feel whilst outside
- Understand the effect of changing seasons on the natural world around them
- **The Natural World ELG**
- Explore the natural world around them, making observations and drawing pictures of animals and plants
- Know some similarities & differences between the natural world around them and contrasting environments, drawing on their experiences & 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.

Science End Points

EYFS - Little Wrens

Milestone I

- Offer comments about their surroundings.
- Use senses to explore the Natural world.

Milestone II

- Begin to use new vocabulary to talk about what they see.
- Begin to show care and concern for living things.

Milestone III

- Use relevant vocabulary in appropriate context
- Show care and concerns for living things.
- Notice similarities and differences between living things.

Final Milestone

- Talk about what they see using a wide vocabulary and link to experiences and stories they have heard.
- Begin to understand how to look after the environment and living things.

EYFS – Reception Robins

ELG: 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.

The end points for each year group show how children apply the knowledge, skills and understanding they are taught before moving on with their learning.

Year 1

Everyday Materials	Plants	Animals including Humans	Living Things and Habitats	Seasonal Changes
Children can.... • name a variety of everyday materials • identify and classify materials based on their physical features • carry out a simple test to answer a question about materials	Children can.... • 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,	Children can.... • identify the human body parts and say which of the senses each part uses? • ask simple questions about the human body	Children can.... • identify and classify animals including fish, amphibians, reptiles, birds and mammals • explain what an omnivore, carniore and herbivore is, with an example of each	Children can.... • identify the seasons • use observations and gathered recordings of the seasons across the year to identify key changes • preform a simple test with equipment to find out what happens to the length of the day?

Year 2

Everyday Materials	Animals including Humans	Living Things and Habitats	Plants
Children can.... • perform simple tests with equipment to make comparisons between materials and their suitability for different uses • test and record how different solids can be changed	Children can.... • identify the basic needs of human and animals and explain why they are important • explain the life cycle of some animals and humans	Children can.... • identify and classify things that are living, dead or never lived • explain why habitats meet the needs of different animals and plants • describe a simple food chain	Children can... • carry out a simple test to find out what plants need to grow and stay healthy? • record my findings to questions in two different ways • observe how plants mature over time and explain what happens

Year 3

Forces and Magnets	Materials – Rocks	Light and Sound	Animals including Humans	Plants

Children can.... • use scientific language to explain magnetism and how magnets work • predict then investigate which materials are magnetic or not	Children can.... • explain how fossils are formed • compare and group different rocks based on given criteria	Children can.... • use scientific language to explain what light is and why it can be dangerous • answer why shadows change over time by setting up an enquiry, recording results and presenting data	Children can... • explain why nutrition is important • use scientific language to explain the importance of the skeleton	Children can... • identify the life cycle of a plant • test how water is transported within a plant and present my findings • plan and carry out a comparative test to see and conclude what plants need for growth?
Year 4				
Living Things and Habitats 	**Animals including Humans** 	**Materials – States of Matter** 	**Light and Sound** 	**Electricity** 
Children can.... • ask questions about why environments change and use the answers to draw conclusions • explore and use classification keys to help group, identify and name a variety of living things •	Children can.... • use scientific language to describe the digestive system • identify teeth and explain the differences in their functions • construct and interpret a variety of food chains, identifying producers, predators and prey	Children can.... • systematically observe and group materials by whether they are a solid, liquid or gas • explain the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature after a practical enquiry • report what happens when materials change state through my own observations	Children can... • explain how sounds are made and the role of vibrations • enquire how sounds change with distance and present my findings in different ways • through enquiry, predict and find patterns between the pitch of a sound and features of the object that produced it • observe then explain how patterns between the volume of a sound and the strength of the vibrations that produced it	Children can... • identify common appliances that run on electricity • explain how a series electrical circuits work and create my own • test the role of a switch in an electrical circuit and present my findings • recognise similarities in some common conductors
Year 5				
Earth and Space 	**Forces** 	**Animals including Humans** 	**Living Things and Habitats** 	**Materials – Properties and changes** 

Children can.... • describe the movement of the earth and other planets relative to the sun • describe the movement of the moon relative to the earth • show how these views have changed over time with scientific discovery • explain the idea of day and night using the earth's rotation • name key scientists in the development of our understanding of space and suggest what their contribution was • record data in tables, charts, scatter, bar and line graphs, labelled diagrams and using this data to make comparisons and draw conclusions	Children can.... • explain the idea of gravity • demonstrate through testing air resistance, water resistance and friction • show how some mechanisms allow a smaller force to have a greater effect	Children can.... • describe changes as humans develop in to old age • make close and detailed observations • report and present findings	Children can... • describe the difference in life cycles between mammals, amphibians, insects and birds • describe the life process of reproduction • name and locate the parts of a plant involved in reproduction	Children can... • compare and group everyday materials based on their properties • use knowledge of solids, liquids and gases to decide how mixtures might be separated • give reasons based on my own fair testing, for the particular uses of materials • describe and demonstrate a reversible and an irreversible change
Year 6				
Light 	**Electricity** 	**Evolution and Inheritance**	**Living Things and Habitats** 	**The Circulatory System** 
Children can.... • after investigation, can conclude and explain scientific evidence about how light appears to travel • explain, using scientific language, how objects can be seen • investigate and present my findings to why objects have the	Children can.... • after investigation, can I conclude why there are variations in components' functions • use symbols to represent a simple circuit	Children can.... • use scientific evidence to explain how living things have changed over time • identify that offspring are not normally identical to their parents • recognise the variables in the environment that may lead to evolution	Children can... • explain scientific ideas about how living things are classified into groups • give reasons, through scientific evidence, why plants and animals are classified based on specific characteristics	Children can... • identify the main parts of the human circulatory system and report the functions of the heart, blood vessels and blood • explain the effects of diet, exercise, drug and lifestyle on human bodies

Progression in Science from EYFS to Year 6

EYFS – Little Wrens

Subject	Autumn term 1 – What Makes me 'me'?	Autumn term 2 – Let's Celebrate
Understanding the World	• Make connections between the features of their families and other families • Notice differences between people • Develop positive attitudes about the differences between people • Consider the ways they have grown and change – beginning to make sense of own life story and family's history • Use senses to explore a variety of natural materials • Make collections to investigate and talk about • Talk about what they see	• Talk about how they have celebrated different events and festivals • Continue to develop positive attitudes about the differences between people • Explore the festivals and celebrations of Halloween, Autumn and Christmas

Subject	Spring term 1 – Snow and Ice	Spring term 2 – People who help us
Understanding the World	• Explore the world around them using a variety of books, photographs and videos • Use simple maps and globes • Talk about the differences between materials and changes they notice	• Experience visits from a range of occupations such as firefighters, police, paramedic, farmer, hairdresser etc.

Subject	Summer term 1 – Growth and Change	Summer term 2 – On the Move
Understanding the World	• Observe and explore growth and decay over time (linked to plants in the kitchen garden) • Plant seeds and learn how to care for them • Talk about different vegetables and how they grow • Learn about a variety of foods and the importance of healthy eating and good dental care • Learn first-hand about the life cycle of butterflies and frogs	• Learn that there are different countries in our world • Talk about what they have noticed or have experienced • Learn about the different ways in which we can travel and how to keep safe • Learn the importance of keeping our oceans and beaches clean – beginning to understand the need to respect and care for the natural environment and all living things

EYFS – Reception Robins

Reception Long Term Plan 23-24

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
General Themes	Friendship & Animals	Stars& Space	Environment	Traditional Tales	Growing	The Seaside
Understanding the World RE / Festivals	Understanding the world involves guiding children to **make sense of their physical world and their community**. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.					
	○ Identify family - Commenting on photos of their family; naming who they can see and of what relation they are to them. ○ Talk about what they do with their family - Can draw similarities and make comparisons between other families. ○ Navigate around our classroom and outdoor areas. ○ Make own investigations of the season of Autumn through Outdoor learning sessions	○ Use photos, discuss how we celebrate Christmas ○ Use world maps to show where some stories, events and festivals are based. ○ Encounter a range of fictional characters and creatures from stories. ○ Identify change in living things – Changes in the leaves, weather, seasons, autumn focus	○ Listen to stories and place events in chronological order. ○ Recognise change in seasons - winter focus ○ Discuss own homes identifying what there is to do near their homes ○ Make close observation of the natural world, including animals and plants ○ Comment on what their home is like to draw comparisons	○ Use new vocabulary where appropriate. ○ Use touch, smell and hearing to explore the natural world through during hands-on experiences. ○ Environments – Identify features of local environment using Google Earth, Google Maps and photos – ○ Use texts and artefacts to draw comparisons with homes now and in the past (Grosvenor Museum Visit)	○ Use the words: recycle, recycling, re-use. ○ Identify ways we can care for the natural world around us. ○ Make comparisons from how they have changed from when they were a baby (past) ○ Make close observation of the natural world, including animals and plants ○ Learn the life cycles of chicks and butterflies ○ Identify change in living things – Changes in the leaves, weather, seasons, Summer focus	○ Make close observation of objects – use the words float, sink, magnetic ○ Make comparisons between contrasting environments using images, stories, props
	Black History Month (October)	Diwali Christmas	Valentines Day (14th February) Lunar new Year	Ash Wednesday Shrove Tuesday Holi Palm Sunday Easter Start of Ramadan	Eid (end of April)	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically (Skills)	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions.	• ask relevant questions • use scientific enquiries • practical enquiries, comparative and fair tests • systematic observations, measurements, equipment – data loggers and thermometers • gather, record, classify and present data to answer questions • scientific language, drawings, keys, charts, tables • report on findings • draw conclusions, predict, suggest improvements and raise questions. Recognise similarities, differences and changes evidence	• ask relevant questions • use scientific enquiries • practical enquiries, comparative and fair tests • systematic observations, measurements, equipment – data loggers and thermometers • gather, record, classify and present data to answer questions • scientific language, drawings, keys, charts, table • report on findings • draw conclusions, predict, suggest improvements and raise questions • Recognise similarities, differences and changes evidence	• different scientific enquiries to answer questions • recognise and control variables • measurements, accuracy and precision, repeat readings • record data and results, use diagrams, labels, keys, tables, scatter graphs, bar and line • use test results to predict, set up comparative and fair tests • report and present finding • conclude and explain • scientific evidence, ideas and arguments	• different scientific enquiries to answer questions • recognise and control variables • measurements, accuracy and precision, repeat readings • record data and results, use diagrams, labels, keys, tables, scatter graphs, bar and line • use test results to predict, set up comparative and fair tests • report and present findings • conclude and explain scientific evidence, ideas and arguments

	Seasonal Changes	Living Things and Habitats				
Knowledge	• observe changes across the four seasons ~ observe and describe weather associated with the seasons and how day length varies (Look in summer terms at patterns identified across the year)	<u>Living Things and Habitats</u> • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in		<u>Living Things and Habitats</u> • 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.	<u>Living Things and Habitats</u> • 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 plants including those involved in reproduction.)	<u>Living Things and Habitats</u> • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics.

		their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.				
Key Assessment Questions		Can I identify and classify things that are living, dead or never lived? Can I explain why habitats meet the needs of different animals and plants? Can I describe a simple food chain?		Can I ask questions about why environments change and use the answers to draw conclusions? Can I explore and use classification keys to help group, identify and name a variety of living things?	Can I describe the difference in life cycles between mammals, amphibians, insects and birds? Can I describe the life process of reproduction? Can I name and locate the parts of a plant involved in reproduction?	Can I explain scientific ideas how living things are classified into groups? Can I give reasons, through scientific evidence, why plants and animals are classified based on specific characteristics?

	Animals Including Humans					
Knowledge	• identify and name a variety	• notice that animals,	• identify that animals, including humans,	• describe the simple functions of the	• describe the changes as	• identify and name the main

	of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	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 humans and some other animals have skeletons and muscles for support, protection and movement.	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.	humans develop to old age (growth, development and puberty)	parts of the human circulatory system, and 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 • describe the ways in which nutrients and water are transported within animals, including humans.

Key Assessment Questions		Can I identify the basic needs of human and animals and explain why they are important? Can I explain the life cycle of some animals and humans?	Can I explain why nutrition is important? Can I use scientific language to explain the importance of the skeleton?	Can I use scientific language to describe the digestive system? Can I identify teeth and explain the differences in their functions? Can I construct and interpret a variety of food chains, identifying producers, predators and prey?	Can I describe changes as humans develop in to old age? Can I make close and detailed observations? Can I report and present findings?	Can I identify the main parts of the human circulatory system and report the functions of the heart, blood vessels and blood? Can I explain the effects of diet, exercise, drug and lifestyle on human bodies? Can I investigate how nutrients and water are transported in animals and humans?
	Materials					
Knowledge	<u>Everyday Materials</u> • 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,	<u>Everyday Materials</u> • 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	<u>Rocks</u> • 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	<u>States of Matter</u> • 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	<u>Properties and changes of materials</u> • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and	

	water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties.	squashing, bending, twisting and stretching.	rocks and organic matter. (Link to geography work – explore rocks and soils in environment)	in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (avoid chemical changes e.g. baking or burning)	response to magnets ~ 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 • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of	

					• state are reversible changes • 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	
Key Assessment Questions		Can I perform simple tests with equipment to make comparisons between materials and their suitability for different uses? Can I test and record how different solids can be changed?	Can I explain how fossils are formed? Can I compare and group different rocks based on given criteria?	Can I systematically observe and group materials by whether they are a solid, liquid or gas? Can I explain the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature after a practical enquiry? Can I report what happens when materials change state through my own observations?	Can I compare and group everyday materials based on their properties? Can I use knowledge of solids, liquids and gases to decide how mixtures might be separated? Can I give reasons based on my own fair testing, for the particular uses of materials? Can I describe and demonstrate a reversible and an irreversible change?	

	Plants					Evolution and Inheritance
Knowledge	• 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,	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• identify and 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 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

Key Assessment Questions		Can I carry out a simple test to find out what plants need to grow and stay healthy? Can I record my findings to question one in two different ways? Can I observe how plants mature over time and explain what happens?	Can I identify the life cycle of a plant? Can I test how water is transported within a plant and present my findings Can I plan and carry out a comparative test to see and conclude what plants need for growth?			Can I use scientific evidence to explain how living things have changed over time? Can I identify that offspring are not normally identical to their parents? Can I recognise the variables in the environment that may lead to evolution?
	Light and Sound				**Earth and Space**	**Light**
Knowledge			• 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	• identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the	• 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	• recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to

			• find patterns in the way that the size of shadows changes	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.	movement of the sun across the sky.	objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Key Assessment Questions			Can I use scientific language to explain what light is and why it can be dangerous? Can I answer why shadows change over time by setting up an enquiry, recording results and presenting data?	Can I explain how sounds are made and the role of vibrations? Can I enquire how sounds change with distance and present my findings in different ways? Through enquiry can I predict and find patterns between the pitch of a sound and features of the object that produced it? Can I observe then explain how patterns between the volume of a sound and the strength of the vibrations that produced it?	Can I describe the movement of the earth and other planets relative to the sun? Can I describe the movement of the moon relative to the earth? Can I show how these views have changed over time with scientific discovery? Can I explain the idea of day and night using the earth's rotation? Can I name key scientists in the development of our understanding of space and suggest what their contribution was? Can I record data in tables, charts, scatter, bar and line graphs, labelled diagrams and	After investigation, can I conclude and explain scientific evidence about how light appears to travel? Can I explain, using scientific language, how objects can be seen? Can I investigate and present my findings to why objects have the same shape as the objects that cast them?

					using this data to make comparisons and draw conclusions?	
	Forces and Electricity					
Knowledge			Forces and Magnets • compare how 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	Electricity • 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	Forces • 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. e.g. levers, pulleys and gears	Electricity • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram.

			• predict whether two magnets will attract or repel each other, depending on which poles are facing.	not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors.		• construct a series circuit, and describe how the changes are made to it circuit may be affected when
Key Assessment Questions			Can I use scientific language to explain magnetism and how magnets work? Can I predict then investigate which materials are magnetic or not?	Can I identify common appliances that run on electricity? Can I explain how a series electrical circuits work and create my own? Can I test the role of a switch in an electrical circuit and present my findings? Can I recognise similarities in some common conductors?	Can I explain the idea of gravity? Can I demonstrate through testing air resistance, water resistance and friction? Can I show how some mechanisms allow a smaller force to have a greater effect?	After investigation, can I conclude and why there are variations in components' functions? Can I use symbols to represent a simple circuit? Can I report and present findings about how changes in a series circuit affect it?