Wilby CE Primary School
Science Knowledge and Progression

Intent

Science provides the foundation for understanding the world around us. Engaging children's natural curiosity, imagination and excitement; science enables children to explore, learn and make sense of the world they live in. Our creative science curriculum will enable children to gain positive attitudes towards scientific knowledge and investigative processes; to understand both the uses and implications of science today, and in the future.

EYFS –see Development Matters 2021 for detailed examples of how to support learning in EYFS

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 places such as zoos, aquariums, museums and forests as well as meeting important members of society such as farmers, 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.

3-4 YEARS & Reception

- 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.
- Explore how things work.
- Explore changes in states of matter
- Explore seasonal change
- 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 and talk about different forces they can feel.

ELG: The Natural World Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Areas of study	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Seasonal Change	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies		
	• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • **Understand that animals, including humans, have offspring which grow into adults** • **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**	• 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 humans and some other animals have skeletons and muscles for support, protection and movement • **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**	• Describe the changes as humans develop to old age. • Identify and name the main 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

Everyday Materials	• Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties • **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** • **Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**		• 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 • Recognise 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			

Living things and their Habitats	• Explore and compare the differences between things that are living, dead, and things that have never been alive. • Identify that most living things 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.	• 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 and have an impact on living things.	• 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. • **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.**			

Plants	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants, including trees. • **Observe and describe how seeds and bulbs grow into mature plants.** • **Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.**	• 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.	
		• 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.	• 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.

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. • 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 Predict whether two magnets will attract or repel each other, depending on which poles are facing.	• 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 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.
		• Recognise that he/she needs 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 eyes. • Recognise that light from the sun can be dangerous and that there are ways to protect eyes. • Find patterns in the way that the size of shadows change	• 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 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.
Sound		• 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 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	•

Rocks		• 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.	•
States Of Matter		• 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.	• 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 • Recognise 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

			• 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
Evolution and Inheritance			• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

EYFS Science Knowledge and Skills Coverage

Content/ Knowledge	Colour	All About Me	Celebrations	Traditional Tales
	-I can explore the world around me, making observations of colour. -I can participate in discussions and offer my own ideas using scientific words -I can understand some important processes and changes in the world, including colour and how they change by mixing.	-Explore the world around them, making observations and drawing pictures of themselves and others. -Know similarities and differences between the natural world around them. -Work and play cooperatively and take turns with others.	I can explore the world around me, making observations of colour. I can participate in discussions and offer my own ideas using scientific words. I understand some important processes and changes in the world, including colour and how they change by mixing.	Speaking - Offer explanations for why things might happen, making use of recently introduced vocabulary from stories. Natural World -Understand some important processes and changes in the natural world around them, drawing on their experiences of what has been read in class. Speaking – offer explanations for why things might happen, making use of recently introduced vocabulary from stories when appropriate.
Scientific Enquiry	Look for patterns when colour mixing Observation over time colour change. Colour absorbency over time.	Identify parts of the body Look for patterns Identify Senses.	Identify shapes and features of a spider. Look for simple patterns. Patterns Observe over time Comparative test	Identify different liquids and materials Simple test
Working Scientifically	Ask how and why questions Show curiosity and question why things happen. Observe and describe what they see using everyday language.	Observe parts of the body Explain ideas clearly. Record learning in a table.	Observe features of a spider. Explain ideas Planning simple test Predict what will happen. Evaluate snow Record results in a simple bar chart.	Make careful observations Ask and answer simple questions. Plan simple tests.
Outcomes	To name different colours To explore mixing colours To explore rainbows To explore shadows.	To name basic body parts To know that we look different as we get older. To describe people who are familiar to them To know how to take care of themselves. To understand some of their senses.	Can name and describe animals that live in different habitats Can talk about what the see and give basic reasons. Can look carefully and draw basic body parts of animals and mini-beasts. Can make basic predictions.	Can name the materials they are using and why. Can talk about the basic properties of materials and why it is suited for a purpose. Can observe changes in their natural world and say why it is different now or will change in the future Can compare and describe how materials change over time. .

Content/ Knowledge	Animals	Under the Sea	Minibeasts and growing	Keeping Healthy
	I can understand the similarities and differences *of animals* in this country and in other countries. I can recognise some environments that are different to the one in which they live. I can understand the effect of changing seasons on the natural world. I can engage in non-fiction books. I can revise and refine my fundamental movement skills.	Explore the natural world around them, making observations and drawing pictures of animals and plants. I can identify animal habitats. I can group fish based on my observations Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. I understand why things float or sink Know some similarities and differences between the natural world around them and contrasting environments.	I can understand important changes and processes in the natural world. I can explore the natural world around me. Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	I can manage my own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. I can show sensitivity to their own and to others' needs.

Scientific Enquiry	Identify where animals may live in the world. I can look for patterns between the animal and its environment. I can observe what happens to the temperature over time with and without insulation. I can research facts about a chosen animal. I can identify different animals and use observations to move like different animals.	I can identify animal habitats I can identify the parts of a fish. I carry out a comparative test. I can identify patterns.	I can identify the stages of a caterpillar I can observe my plant growing over time. I can use research to identify insects. I can identify parts of a minibeast. I can notice changes I can observe my habitat over time.	I can identify different ways to keep myself healthy I can observe how germs spread over time. I can identify simple patterns. I can identify different emotions.
Working Scientifically	Notice similarities and differences within the seasons. I can make sensible predictions about where animals may live. I can explain in simple terms how animals adapt to their habitat. I can ask questions to help research facts about an animal. I can apply my knowledge of animals through movement.	I can ask simple questions I can group using my observation skills. I can make simple predictions. I can draw pictures using my observation skills. I can make careful observations.	I can make careful observations. I can test out my ideas. I can record my findings. I can interpret my findings using a model. I can record using my chosen method. I can talk about my learning when creating my habitat.	I can record ways to keep myself healthy. I notice how germs are spread. I can predict what will happen to my body if I exercise. I can describe and draw different emotions.
Outcomes	Children can identify why habitats are important to animals Children can identify some animals from specific habitats Children understand hibernation and its purposes Children can discuss why some animals are suited for different habitats	Children will be able to identify animal habitats under the sea. -Group fish based on observations. -Children understand why things float or sink. -Children can make observations of plants and animals. -Children will be able to label basic fish anatomy	Children can identify the various stages of the life cycle of a caterpillar/butterfly Children can identify foods that are grown and come from plants Children can identify any of the things a plant needs to grow Children can identify parts of an insect Children can use relevant scientific language Children can identify minibeast habitats and why they live there?	Children can identify ways to keep healthy. Children will understand why we need to stay clean Children will know how some germs can make them ill. Children will understand what a dentist's role is. Children will understand why it is important to have a clean environment. Children will understand that they need to eat different foods. Children will understand why it is important to exercise. Children will understand the importance of sleep and can identify different emotions.

Content/ Knowledge	<u>People who help us</u> ELG: Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. ELG: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. ELG: Talk about the lives of the people around them and their roles in society.	<u>Materials</u> Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about the differences between materials and changes they notice. Learn new vocabulary	<u>Seasons.</u> I can explore the world around me, making observations of colour. I can participate in discussions and offer my own ideas using scientific words. I understand some important processes and changes in the world, including colour and how they change by mixing.	

Scientific Enquiry	I can make observations over time I know why we must brush our teeth. I understand the roles of people who help us. I can compare different materials. I can look for similarities and differences in people's appearance when describing. I can identify patterns and prints.	I can identify and sort different materials. I can identify and sort different materials. I can compare how different materials react in water. I can compare how different materials react in water.	I can identify each season. I can observe a tree over time through the seasons. I can use ID charts to find out about seasons. I can identify each season and classify things in the correct season. I can use the pictures from stories to help me learn about seasons. I can identify and classify between different seasons		
Working Scientifically	I can test out ideas to find out new things I can explain why it is important to clean our teeth. I can ask questions about why firefighters need to stay fit and healthy. I can make basic predictions. I can give detailed descriptions and record my results using pictures. I can use my observation skills to solve problems.	I can draw pictures or spot different materials in my environment. I can draw pictures or spot different materials in my environment. I notice similarities and differences within the materials. I notice similarities and differences within the materials.	I can draw pictures to explain what happens in each season. I can make careful observations about the changes in the seasons. I can explain what happens in each season I can make simple predictions about which seasons things belong in. I can ask questions to help my understanding I can evaluate my learning and demonstrate my knowledge of seasons.		
Outcomes	- Can children identify the people that can help them? - Can children identify ways to and why they need to keep their teeth clean? - Can children identify what is needed to cause a fire and what to do in the event of one? - Can children discuss the role of the fire service? - Can children identify the skills/role of the police? - Can children use observational skills for a purpose?	Can children identify different materials? - Can children identify the properties of different materials? - Can children identify the purposes of different materials? - Can children begin to conduct simple experiments? - Can children use materials for a purpose?	Children will understand that there are four seasons -Children will be able to name the four seasons -Children will be able to use some scientific words to describe their environment and link it to the season they are in. -Children will be able to draw their own ideas about their own environment and things that they like to do in each season. -Children will be able to describe the changes between each season and describe why some things belong in certain seasons.		