MILLFIELDS CE PRIMARY

Knowledge and Skills Progression: Scientific Enquiry

Year group	Computer Science	Information Technology	Digital Literacy	Looking for Patterns	Explaining Results	Evaluating
Nursery (F1)	• Talk about what they see, hear and feel begin to use a wider vocabulary • Begin to talk about some likes / dislikes • Explore how familiar things work	• With support, to plan and make decisions about how to approach a task, solve a problem or reach a goal. • Carry out simple tests.	• Use all their senses in hands on exploration. • Explore how things work. • Talk about changes they notice.			
Reception (F2)	• Describe what they see, hear and feel. • Ask questions to find out more and to check they understand what has been said to them. • Use new vocabulary in different contexts. • Offer explanations for why things might happen, making use of recently introduced vocabulary.	• To plan and make decisions about how to approach a task, solve a problem or reach a goal. • Carry out simple and comparative tests. • Perform simple tests and compare results.	• Explore the natural world around them, making observations and drawing pictures. • Describe what they see, hear and feel whilst outside. • Know some similarities and differences between the natural world around them and contrasting environments.			

Year 1 and 2	• Ask simple questions and recognising that they can be answered in different ways. • Recognise scientific and technical developments that help us.	• Perform simple tests or follows teachers' instructions. • With guidance, suggest what they will do. • With guidance, identify things to measure or observe that are relevant to the question. • Use resources provided or chosen from a limited range. • Use simple measurements and equipment to gather data. • Suggest why a test is unfair.	• Observe closely (including changes over time), using simple equipment. • Make measurements using non-standard units. • Use simple secondary sources to find answers gather simple data to help answer questions. • Record findings in a range of ways, eg. simple tables, diagrams, pictograms, sorting circles, bar charts and templates. • Talk about their findings using everyday terms, text scaffolds or simple scientific language.	• Use simple observable features to compare objects, materials and living things. • Identify and classify (decides how to sort and group objects). • With guidance, begin to notice changes (ie. cause and effect), patterns and relationships (ie. how one variable affects another).	• Talk about what they have found out and how they found it out. • Use their observations and ideas to suggest answers to questions use comparative language to describe changes, patterns and relationships.	• With support, suggest whether or not what happened was what they expected. • With support, suggest different ways they could have done things.

Year 3 and 4	• Ask relevant questions and using different types of scientific enquiries to answer them. • Explain the purposes of a variety of scientific and technological developments.	• Set up simple practical enquiries, comparative and fair tests. • Begin to make decisions about what observations to make and how long to make them for. • Begin to choose the type of simple equipment that might be used from a reasonable range. • Use appropriate equipment and measurements with reasonable accuracy. • Recognises when a simple fair test is needed with help, decide how to set up a fair test and control variables.	• Make systematic and careful observations. • Make accurate measurements using standard units, using a range of equipment. • Recognise when and how secondary sources might help answer questions that cannot be answered through practical investigations. • Gather and record data in a variety of ways. • Make decisions about how to record and analyse the data and prepare own formats for recording. • Record and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables. • Report on findings from enquiries, in simple scientific language.	• Use observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases). • Identify differences, similarities or changes related to simple scientific ideas and processes with help. • Look for changes, patterns, and relationships in their data.	• With help, use results to draw simple conclusions and answers questions using appropriate level of knowledge. • Use straightforward scientific evidence to answer questions or to support their findings. • Use relevant scientific language to discuss their ideas and communicate their findings.	• With support, use results to suggest improvements to what they have done. • With support, raise further questions (eg. arising from the data). • With support, make predictions for new values within or beyond the data collected.

Year 5/6	• Use their scientific experiences to explore ideas and raise different types of questions. • Talk about how scientific ideas have developed over time. • Recognise the applications of specific scientific ideas.	• Select and plan different types of scientific enquiries to answer questions. • Make decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them choose the most appropriate equipment to make measurements. • Explain how to use the equipment accurately recognise when and how to set up comparative and fair tests. • Recognise and controls variables where necessary (eg. explains which variables need to be controlled and why).	• Take measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision. • Take repeat readings when appropriate recognise which secondary sources will be most useful to research their ideas. • Begin to separate opinion from fact record data and results of increasing complexity, making own decisions about how to record. • Calculate mean value where appropriate record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Report on findings from enquiries, using relevant scientific language, in oral and written explanations such as displays and other presentations.	• Use and develops keys and other information records to identify, classify and describe living things and materials. • Identify conclusions, causal relationships and patterns.	• Draw valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (eg. recognises limitations of data). • Identify scientific evidence that has been used to support or refute ideas or arguments. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	• Make practical suggestions about how their working method could be improved (eg. the effect of sample size on reliability). • Use results to identify when further tests and observations might be needed. • Use test results to make predictions and to set up further comparative and fair tests.

Knowledge and Skills Progression: Biology

Year group	Plants	Animals, including humans	Living things and their habitats
Nursery (F1)	• Begin to understand that trees / plants and flowers are living things and need to be cared for.	• Identify and name main body parts • Explore and understand the use of some body parts • Name and talk about different pets • Match and name baby to adult pet • Name some different woodland animals.	• Learn to touch living things carefully • Begin to explore different animal habitats linked to autumn time.
Reception (F2)	• Recognise and name some familiar plants in their local environment • Explore the natural world around them and begin to describe what they see, hear and feel whilst outside (including plants and animals) • Observe and begin to talk about how plants change during growth, beginning to use some correct terminology	• Find out about animals in contrasting natural environments • Recognise and name some familiar animals in their local environment • Observe and begin to talk about how humans change during life cycles, beginning to use some correct terminology	• Understand the effects of changing seasons on the natural world
Year 1	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 Plant Detectives • Make comparisons between different types of flowers • Identify types of plants grown in our local area • Understand what happens underground beneath plants	Looking at Animals • 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) Using Our Senses • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Animal Antics • 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).

Year 2	The Apprentice Gardener • 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	Growing Up • Notice that animals, including humans, have offspring which grow into adults • Find out about and describe the basic needs of animals, including humans, for survival Take Care • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	What is your Habitat? • 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 • Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Our Changing World • 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 • Identify and name different sources of food
Year 3	How Does Your Garden Grow? • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Our Changing World • 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	Amazing Bodies • 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	
Year 4	Our Changing World • Explore and use classification keys to help group • Identify and name a variety of living things in their local and wider environment	Who Am I? • Identify and classify animals • Identify characteristics of the main vertebrate groups and some of the common invertebrate groups Where Does All The Food Go? • 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	Human Impact • Recognise that environments can change and that this can sometimes pose dangers to living things.

Year 5/6	The Nature Library • 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. • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, and bar and line graphs.	Body Pump and Health • Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood. Everything Changes • Recognise that living things produce offspring of the same kind, but that offspring normally vary and are not identical to their parents. • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, and bar and line graphs.	Our Changing World • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, and bar and line graphs.

Knowledge and Skills Progression: Materials and Physics

Year group	Materials	Light and Sound	Forces and Electricity
Nursery (F1)	• Use all their senses to explore the natural world around them, developing • concentration and observational skills • Compare natural materials and begin to talk about similarities, differences and • patterns • Experiment with ways of grouping / sorting different objects by material and • properties – sorting leaves • Begin to identify and name some different everyday materials • Linked to houses / recycled materials • Begin to notice and talk about how the properties of materials have changed • Explore different forces with their bodies • Observe and talk about how forces can change the speed / direction of an • object • Begin to make predictions • Begin to measure forces / distances		• Explore how familiar things work • Explore different forces and begin to use language of push and pull • Explore and talk about different forces they can feel • Explore mechanical toys and talk about how they move • Explore how vehicles travel on ramps of different gradients
Reception (F2)	• Use their senses to explore the natural world around them • Experiment with ways of sorting and grouping based on features / properties • Identify and name some different everyday materials • Use language to compare material • Explore and investigate materials with similar / different properties • Investigate and talk about how the properties of materials have changed • Observe and talk about natural processes – a puddle drying up in the sun / heat		

Year 1	Everyday Materials • Distinguish between an object and the material from which it is made • Describe the simple physical properties of everyday materials • Compare and group together a variety of everyday materials on the basis of their simple physical properties	•	•
Year 2	Good Choices • Identify and compare the suitability of a variety of everyday materials for particular uses Shaping Up • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	•	Good Choices • Identify and compare the suitability of a variety of everyday materials for particular uses Shaping Up • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Year 3	Rock Detectives • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Recognise that soils are made from rocks and organic material • Describe in simple terms how fossils are formed when things that have lived are trapped within rock	Light – Can You See Me? • 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 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 change	The Power Of Forces • Compare how things move on different surfaces notice that some forces need contact between two objects • 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 • Identify some magnetic materials • Predict whether two magnets will attract or repel each other depending on which poles are facing
Year 4	In A State • 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	Good 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 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	Switched On • 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

Year 5/6	•	Light Up Your World • 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 that objects are seen because they give out or reflect light into the eye.	Danger Low Voltage • Compare the functions of different components, giving reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off positions of switches. • 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, and use recognised symbols when representing a simple circuit in a diagram.