Park Street C of E Primary School Progression of Science Learning

Early Years

In the Early Years (Reception) is taught through the curriculum area of 'Understanding the world' and is facilitated through direct teaching, continuous and enhanced provision. Science learning has a particular focus in the following topics: 'Marvellous Me', 'Fairy Tales', 'Deep in the Woods', 'Potty about Plants' and 'Up, up and away' . Additionally, we follow children's interests in our continuous and enhanced provision and this regularly has a science investigation skill focus. Children's learning is extended and developed through skilful questioning and 'in the moment' planning, further opportunities can then be planned for subsequent learning. Learning is assessed through observations and recorded in individual children's learning journals on Tapestry. Children in the Early Years are encouraged to develop a love of science learning through their playful exploration and collaboration. For a more detailed breakdown of science learning in Owl Class please use

EYFS science 21 22 + Y1.doc

Understanding the World ELG	Prime ELG addressed through the science curriculum	Specific ELG addressed through the science curriculum
- 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 changes of state**	• Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. • Make comments about what they have heard and ask questions to clarify their understanding. • Hold conversation when engaged in back-and-forth exchanges with their teacher and peers. Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. • Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. • Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher. Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate. • Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions. Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and **understanding the importance of healthy food choices.** • Use a range of small tools, including scissors, paintbrushes and cutlery. Begin to show accuracy and care when drawing.	Use and understand recently introduced vocabulary during discussions about stories, non-fiction, rhymes and poems and during role play. Read aloud simple sentences and books that are consistent with their phonic knowledge, including some common exception words Write simple phrases and sentences that can be read by others. • Have a deep understanding of number to 10, including the composition of each number. • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other Quantity`. • Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class. • Understand the past through settings, characters and events encountered in books read in class and storytelling.Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used.

SCIENTIFIC ENQUIRY OBJECTIVES TO BE TAUGHT WITHIN SCIENCE LEARNING TOPICS

Developments Matters ELG	Year 1 Year 2	Year 3 Year 4	Year 5 Year 6
Working scientifically – Pupils should use the following scientific methods, processes and skills:			
• Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. • Make comments about what they have heard and ask questions to clarify their understanding. • Hold conversation when engaged in back-and-forth exchanges with their teacher and peers. Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. • Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. • Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher. Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate. • Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions. Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Use a range of small tools, including scissors, paintbrushes and cutlery. Begin to show accuracy and care when drawing.	1. Asking simple questions and recognising that they can be answered in different ways 2. Observing closely, using simple equipment 3. Performing simple tests 4. Identifying and classifying 5. Using their observations and ideas to suggest answers to questions 6. Gathering and recording data to help in answering questions *(There is detail of specific experiences it is desirable that KS1 children have in the notes and guidance section of the NC)* **Pupils should experience different types of scientific enquiry:** Fair test Observation over time (OoT) Pattern seeking/surveys Identifying, grouping and classifying Research	1. Asking relevant questions and using different types of scientific enquiry to answer them 2. Setting up simple practical enquiries, comparative and fair tests 3. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers 4. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. 5. Recording finding using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. 6. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 7. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 8. Identifying differences, similarities or changes related to scientific ideas or processes 9. Using straightforward scientific evidence to answer questions or to support their findings.	1. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where appropriate. 2. Taking measurements using a range of scientific equipment with increasing accuracy and precision 3. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs. 4. Using test results to make predictions to set up further comparative and fair tests 5. Use simple models to describe scientific ideas. 6. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations. 7. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Developments Matters ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PUPILS SHOULD BE **TAUGHT** TO…						
Living things and their habitats						
- 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		Explain 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 **microhabitats (Key words that must be taught)** 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 to living things	Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the process of reproduction in some plants (sexual and asexual) and animals Link to animals including humans topic	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms Give reasons for classifying plants and animals based on specific characteristics.

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Plants						
- 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	Identify and name a variety of common plants including garden plants, wild plants and trees and those classified as deciduous and evergreen Identify and describe the basic structure of a variety of common plants, including trees (including roots, stem/trunk, leaves and **flowers**.)	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 plants: roots, stem, 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		Plant knowledge needed for living things in their habitats unit. OBJ. from Habitats unit; Describe the process of reproduction in some plants (sexual and asexual) and animals	Plant knowledge needed for living things in their habitats unit OBJ. from Habitats unit; Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms Give reasons for classifying plants and animals based on specific characteristics.

Developments Matters ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans						
- Explore the natural world around them, making observations and drawing pictures of animals and plants Manage their own basic hygiene and personal needs, including dressing, going to the toilet and **understanding the importance of healthy food choices.** - 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	Identify and name a variety of common animals including birds, fish, amphibians, reptiles and mammals. Identify and name a variety of common animals that are carnivores, herbivores, omnivores Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, 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. Charles Darwin and his 'Sand Walk'	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 (water, food and air) Describe the importance for humans of exercise and 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 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 from birth to old age. SEX ED YEAR	Identify and name the main parts of the human circulatory system, and explain 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. LIFE BUS

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Light						
			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 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.

Developments Matters ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Topics for individual year groups						
- Understand some important processes and changes in the natural world around them, including the seasons - 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	**Seasonal changes** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies		**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.		**Earth and Space** 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. Ptolemy Alhazen Copernicus	**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. 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. Mary Anning Charles Darwin Alfred Wallace

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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 sound and features of the object that produced it. Find patterns between the volume of sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases		

Developments Matters ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces						
			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 2 poles. Predict whether two magnets will attract and repel each other, depending on which poles are facing.		**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. Galileo Isaac Newton	

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Electricity						
				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 not a lamp lights in a simple series circuit. Recognise some common conductors and insulators and associate metals with being good conductors	.	**Electricity** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in circuit. Compare and give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches Use recognised symbols when representing a circuit in a diagram.

Developments Matters ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials						
- Understand some important processes and changes in the natural world around them, including **changes of state** - Explore the natural world around them, making observations and drawing pictures of animals and plants	**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	**Uses of everyday materials** 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 Biographies: Dunlop, Mackintosh, MacAdam		**States of matter** 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. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	**Properties and changes materials** Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. Know that some substances will dissolve in liquid to form a solution and 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 the 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.	