

Lilliput CE Infants – Long term coverage plan - Science Progression

Subject: Science

Overview:

At Lilliput Infant School, we are firm believers that science is an integral part of our past, present and future lives. We aim to foster a passion for investigating, understanding and applying science. We strive to promote the love of learning science and for children to understand and be curious about the science within their everyday lives. We promote the importance of an investigative approach through regular 'hands on' experiences wherever possible. We ensure all children work scientifically during lessons and work collaboratively investigating different concepts and ideas. It is our intention that by the end of the Key Stage, each child will understand a variety of scientific concepts and be able to confidently, discuss them. It is our vision to create a *cultural science capital* for the children to gain knowledge and skills for long term retention.

Pupils will be learning to:

	<u>Progression</u>				
<u>Working Scientifically</u>	Nursery	Year R	Year 1	Year 2	Year 3
Questioning	Answer simple questions	Ask simple questions e.g. what they see	Ask more complex questions e.g. senses: see, taste, hear, smell, feel	Ask questions about the world around us and recognise that they can find answers in different ways	Ask questions about their scientific topics
Observing	Use their senses in hands-on exploration of natural materials Use new modelled language related to observation	Identify what is the <i>same</i> and what is <i>different</i> by describing what has been observed After close observation, draw pictures	Support to make observations e.g. what they <i>see, taste, hear, smell</i> and <i>feel</i> <i>Compare, contrast and describe why they have grouped objects</i>	Make clear observations without prompting e.g. using all their senses Use observations and ideas to suggest answers to questions.	Observe detail carefully Use different methods to answer questions, including research, observation and experiments.
Predicting	Refer to books, displays to support investigations	Predict <i>what will happen</i> during play e.g. water and floating	Make predictions based on observations	Make <i>predictions</i> based on their questions and observations	Use both research and tests to try to answer questions, making predictions
Experimenting	Explore how things work	Test their predictions through play experimenting Perform simple tests with support	Use a magnifying glass and other simple equipment with support Observe closely using simple equipment and perform simple tests.	Use simple <i>equipment</i> such as <i>timers</i> , rulers and <i>magnifying glasses</i> Perform a more complex test – e.g. comparative test Understand that a test should be fair	Use more complex equipment such as <i>data loggers</i> with support Start to identify ways to make a test fair

Lilliput CE Infants – Long term coverage plan - Science Progression

<u>Working Scientifically</u>	Nursery	Year R	Year 1	Year 2	Year 3
Analysing, concluding.	Talk about what they see using new and wider vocabulary	Talk about what happened and start to use comparative terms <i>e.g. bigger/smaller</i> Talk about <i>changes</i> . Explain why things work and why they happen	Record data with support <i>e.g. drawing/completing a table</i> Use first hand experiences to suggest answers to questions Compare relevant objects or pictures with support	Compare objects, and suggest ways of comparing or grouping them. Record data in a variety of ways, <i>e.g. table, graph, diagram, tally chart</i> Explain what happened in an <i>investigation</i> .	Record <i>data</i> in tables, <i>bar charts</i> , and diagrams. State what they have found out, using their data or observations. Suggest how an investigation could have been improved.
Identifying and classifying	Talk about similarities and differences with support.	Beginning to identify and classify by similarities and differences with prompts.	<i>Identify and classify with less adult support,</i> <i>e.g. group similar objects of items together</i>	<i>Identify different things and can group similar ones together, explaining their choices.</i>	Identify and classify items based on their scientific properties.
Possible vocabulary	<i>test, look</i>	<i>test, prediction, observe</i>	<i>prediction, observe, test, object, record</i>	<i>properties, observe, test, magnifying glass, object, record, equipment,</i>	

Strand	Nursery	R	1	2	3
Plants	Plant seeds and care for growing plants.	Name and describe basic plants Tulip flower, roots, petal, stem Know plants need water and sunlight to grow Explore natural world making drawings and observations of plants.	Identify at least 2 garden plants (runner beans / sunflower) and 2 wild plants (daisy, dandelion) Observe the growth of something they have planted *Plant or found in the school grounds to ensure observed and aware* Understand two tree types: evergreen (e.g. pine tree) and deciduous (e.g. oak tree) Identify the following parts of plants and trees: leaves, flowers, trunk, roots, stem, petals, fruit, bulbs, seeds, branches.	Know plants grow from seeds and bulbs (e.g. daffodil / lavender) *Observe this / comparative test / plant in grounds – do this via lesson investigations. Understand they need water, light and the right temperature. *Perform tests experimenting different conditions effect a plant's growth. <u>Germination</u> is when a seed starts to grow. Observe and describe these changes.	⇒ Flowering plants have: roots, stem, leaves and flowers. ⇒ A seed grows into a new plant through pollination, dispersal and germination. ⇒ Plants need air, light, water, nutrients from soil, and room to grow; they make their own energy

Lilliput CE Infants – Long term coverage plan - Science Progression

			Draw and label diagrams of different parts of a plant and trees.		
Key Vocabulary	flower, tree	roots, petal, flower, stem, plant, water, sunlight	<i>deciduous, evergreen, plant, tree, roots, stem, leaves, trunk, flower, petal, seeds, trunk, seeds</i>	<i>As previous plus - healthy, germination, nutrients, temperature, bulb, survival</i>	
Strand	Nursery	R	1	2	3
Animals, including humans.	Understand the key features of the life cycle of an animal.	<i>Name and describe common animals and their baby animals</i> <i>dog, cat, cow, pig</i> <i>puppy, kitten, calf, piglet</i> *future link to offspring <i>Name and label 4 basic body parts.</i> <i>head, arms, legs and feet.</i> <i>Name healthy foods.</i> <i>apple, bananas, peas, carrots</i> Know basic hygiene e.g. wash hands / cleaning teeth To know that sugar is bad for your teeth Describe what they see, hear and feel whilst outside.	Name at <u>least one</u> of the following; <i>fish, amphibian, reptile, bird and mammal.</i> <i>shark, frog, snake, owl, dog.</i> Describe and compare the structure of a variety of common animals <i>legs/no legs, wings, feathers, fur, scales</i> Learn and use terms: <i>carnivore (shark, lion, tiger), omnivore (pig, human, bear) herbivore (rabbit, cow, elephant)</i> Explain what they eat. Name, draw and label basic body parts. <i>E.g. ears, eyes, mouth, nose, tongue, hands, feet, head, arms, legs, knees, face, hair, teeth, elbows,</i> Say which part of the body is associated with each sense – see, taste, hear, smell and feel.	Describe the basic needs of animals, including humans, for survival (e.g. food, water and air) Know animals including humans have babies (<i>offspring</i>) that grow into adults. Describe the importance of eating the right amounts of different food types: Name and example. <i>Protein = chicken</i> <i>Carbohydrates = rice</i> <i>Fats = chocolate</i> <i>Dairy = milk</i> <i>Fruit/vegetables = apple / carrots)</i> *The Eatwell Guide* Understand that to stay <i>healthy</i>, humans need to <i>exercise</i> Understand the meaning of <i>hygiene</i>. Keep things clean, including washing hands / washing / teeth etc. *Germ gel investigation.	⇒ Humans and some animals have skeletons and muscles for support, protection and movement. ⇒ Animals can not make their own food: they require the right amount of nutrition from what they eat ⇒ Know that a vertebrate is an animal with a back bone e.g. dog, humans and elephants
Key Vocabulary	Animal, cat, dog	<i>Healthy, clean, dirty, animals, baby, cat, dog, cow, pig, puppy, kitten, calf, piglet, head, arms, legs and feet, apple, bananas, peas, carrots</i>	<i>fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore, skeleton, head, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, nose and tongue, hands wing, claw, fin, scales,</i>	<i>Offspring, exercise, heartbeat, breathing, hygiene, germs, food types, survival, protein, carbohydrates, fats, dairy, fruit/vegetables</i>	

Lilliput CE Infants – Long term coverage plan - Science Progression

			<i>feathers, senses, feel, see, smell, taste, hear.</i>		
Strand	Nursery	R	1	2	3
Materials	Describe changes in materials through cooking or observing things melting Explore collections of materials with similar and/or different properties	Choose and name some common materials to build with. wood, plastic, metal Understand some of the changing states of matter. Know about similarities and differences in relation to materials e.g. hard, soft, heavy, light Understand some important processes and changes of the natural world around them	Name objects and say what they are made of. wood, plastic, metal, glass, water and rock, brick, paper, fabric. Describe the simple physical properties of a variety of everyday materials. hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent Group materials e.g. all hard ones compared to all soft ones. Choose the best material for a specific purpose	Identify and compare the <u>suitability</u> of a variety of everyday materials wood, metal, plastic, glass, brick, rock, water, paper, fabric, cardboard. e.g. Chair is made of plastic because it is strong so it won't break if I sit on it For at least two materials, link a property to how suitable these materials are for particular uses, e.g. bricks used for houses cannot be squashable, glass used for windows must be transparent, fabric for tent must be waterproof and soft. Find out how easily materials can be squashed, bent, twisted and stretched Find out about people who have invented useful new materials, e.g. John Dunlop, Charles Macintosh and John McAdam.	Not in N.C
Key Vocabulary	wood, plastic, metal hard, soft	materials, wood, plastic, metal hard, soft, heavy, light	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, not bendy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull	Names of materials – increased range from year 1 (wood, metal, plastic, glass, brick, rock, paper and cardboard) Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, waterproof, absorbent, shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching, Friction, suitability, surface	

Lilliput CE Infants – Long term coverage plan - Science Progression

Strand	Nursery	R	1	2	3
Seasonal Changes	Understand the need to respect and care for the natural environment and all living things.	Describe what they see, hear and feel whilst outside. Identify different features outdoors <i>cold, damp, wet, shady, warm</i> Understand the effect of changing seasons <i>weather types</i> <i>rain, sun, snow, windy</i> Understand some important processes and changes in the natural world around them, including the seasons.	Name and say what differences there are between the four <i>seasons</i>. <i>e.g. seasons</i> <i>Winter, Summer, Spring, Autumn</i> <i>snow, rain, wind, hot, cold, temperature.</i> Know days are shorter in winter <i>*day length</i> understanding in months for the year Can make a bar chart about day length. Temperature chart. Know that it is not safe to look directly at the sun even when wearing sunglasses.	Not in N.C.	Not in N.C.
<u>Key Vocabulary</u>	Sun, clouds, rain, snow	Weather / season <i>Winter, Summer, Spring, Autumn</i> <i>Rain, sun, snow, wind, cloudy,</i> <i>Cold, damp, wet, shady, warm</i>	<i>Weather (snow, rain, wind, day length, hot, cold, temperature.),</i> <i>Seasons (Winter, Summer, Spring, Autumn),</i> <i>Sun, sunrise, sunset, day length,</i> <i>monsoon, thunder storm</i>		
Strand	Nursery	R	1	2	3
Living things and their habitats	Explore areas of living animals and insects Talk about features	<i>Identify at least 2 ways we care for the natural world around us, e.g. don't drop litter / walk to school</i> <i>Explore the natural world around them, making drawings and observations of plants and animals.</i>	Not in N.C	Identify if something is <i>alive, dead, or never alive</i>. Describe why: <i>*MRS GREN</i> Understand things are <i>suited to the habitats</i> they live in. The habitat provides <i>food, water and shelter.</i> Identify plants and animals in at <i>least 1 micro-habitat</i> (e.g. woodlice – stones, leaves, bark) and <i>1 larger habitat.</i> (e.g. Woodland / ocean)	Not in N.C

Lilliput CE Infants – Long term coverage plan - Science Progression

				Draw arrows on a <i>food chain</i> to show what eats what (specific living things). Start food chains with plants. (grass, cow, human) *Link to the transfer of energy Revise the terms carnivore, herbivore and omnivore.	
<u>Key Vocabulary</u>	Wood, forest, pond	Wood, forest, pond, sea Warm, cold, wet, food		<i>Living, dead, never alive, suited, suitable, basic needs, food, food chain, shelter</i>, names of local habitats e.g. ocean, woodland etc., names of micro-habitats e.g. under logs, in bushes etc. <i>energy, microhabitat, life cycle, source, nutrients, reproduction, environment</i>	

Lilliput CE Infants – Long term coverage plan - Science Progression

Progression in National Curriculum Knowledge (National Curriculum statements in red are from other linked topics.)

	Early Learning Goal (UTW)	Year 1	Year 2	Year 3
Plants	<u>Understanding the World:</u> <u>The Natural World ELG</u> <i>Children at the expected level of development will:</i> -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.	Pupils should be taught to: - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. - identify and describe the basic structure of a variety of common flowering plants, including trees.	Pupils should be taught to: - 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 name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)	Pupils should be taught to: - 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.
Animals, Including Humans	<u>Understanding the World:</u> <u>The Natural World ELG</u> <i>Children at the expected level of development will:</i> -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.	Pupils should be taught to: - 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	Pupils should be taught to: - 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, eating the right amounts of different types of food, and hygiene.	Pupils should be taught to: - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. - identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Lilliput CE Infants – Long term coverage plan - Science Progression

Living things and their habitats	<u>Understanding the World:</u> <u>The Natural World ELG</u> <i>Children at the expected level of development will:</i> -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.	Pupils should be taught to: - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) - Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) - Observe changes across the four seasons. (Y1 - Seasonal change)	Pupils should be taught to: - explore and compare the difference 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 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. - Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)	Pupils should be taught to: -Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Seasonal Changes	<u>Understanding the World:</u> <u>The Natural World ELG</u> <i>Children at the expected level of development will:</i> -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.	Pupils should be taught to: - observe changes across the four seasons. - observe and describe weather associated with the seasons and how day length varies.		

Lilliput CE Infants – Long term coverage plan - Science Progression

Materials	<u>Understanding the World:</u> <u>The Natural World ELG</u> <i>Children at the expected level of development will:</i> -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.	Pupils should be taught to: • distinguish between an object and the material from which it is made. • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, 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.	Pupils should be taught to: • 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.	Pupils should be taught to: - Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) - Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) - Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)
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