Science at Thameside

Science intent:

At Thameside we recognise the importance of science in all aspects of life. The Science curriculum fosters curiosity in children and we encourage children to be inquisitive during their time here. We provide opportunities for children to acquire and develop key scientific knowledge and skills. We ensure that Working Scientifically skills are taught and developed throughout the children's time at Thameside so they can use equipment, conduct experiments, explain concepts confidently and continue to ask questions and be curious about the world around them. Our curriculum is designed to build on previous learning experiences to ensure children retain skills and knowledge and are able to make links within the science curriculum and with other subjects.

	Autumn – Noticing		**Spring – Managing distractions**		**Summer – Imagining**	
Year A	Scientists:		Scientists: Explorer: Matthew Henson		Scientists:	
	LtL perseverance		LtL making Links		LtL	
N	Can I name my body parts? What can I see outside? (Autumn)		Where does fruit come from? What can I see outside? (Spring)		Can I name the key features of a plant? What can I see outside (Summer)	
R	What happens in Autumn? Are all pumpkins orange? How are buns made?	What happens in winter? What is light source? Which light sources are natural and which are man-made?	Why do thing float in Space?	Were all dinosaurs big? What did dinosaurs eat? What happens in Spring?	How do plants grow? How do caterpillars turn into butterflies? What s the life cycle of a chick?	What happens in Summer? How do we keep safe in the sun? Who lives under the sea? Which objects float and sink?
1	Everyday materials	Seasons *forces – push & pull (castle weapons)*	Y1 - Animals including humans (wolves)	Seasons	Plants	Seasons
2	Using Everyday material	*forces – push & pull (castle weapons)*	Animals including humans (wolves)	Living things and their habitats	Plants	Living things and their habitats
3	Animals including humans: nutrition, skeleton & muscles Light		Rocks Forces & magnets		plants	
4	Animals including humans: digestive system, teeth / food chains Sound		Electricity States of matter (water cycle)		Living things & habitats	

5	(AIH) Ageing / Life cycles Earth & Space	Properties & changes of materials Forces	Living things & their habitats: Reproduction plants & animals (Pubity)
6	Animals including humans: Circulation, nutrients transport, Healthy lifestyles / Light	Electricity	Living things & their habitats: Classification – micro-organisms, plants & animals / Evolution & inheritance Beetle Boy, Moth

Development matters Understanding the World	
Nursery	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. 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. Talk about the differences between materials and changes they notice.	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. ***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.*

Working scientifically		
KS1	**Lower KS2**	**Upper KS2**
During **Years 1 and 2,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During **Years 3 and 4,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During **Years 5 and 6,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
asking simple questions and recognising that they can be answered in different ways	asking relevant questions and using different types of scientific enquiries to answer them	
Performing simple tests	Setting up simple practical enquiries, comparative and fair tests	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables

Working scientifically		
		where necessary
observing closely, using simple equipment	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
gathering and recording data to help in answering questions	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
identifying and classifying	identifying differences, similarities or changes related to simple scientific ideas and processes	identifying scientific evidence that has been used to support or refute ideas or arguments
Using their observations and ideas to suggest answers to questions	using straightforward scientific evidence to answer questions or to support their findings. using results to draw simple conclusions, make predictions for new values and suggest improvements and raise further questions	using test results to make predictions to set up further comparative and fair tests **Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results**, in oral and written forms such as displays and other presentations
	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, **in oral and written forms such as displays and other presentations**

Plants:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	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		Describe the life process of reproduction in some **plants** (and Animals, including humans)	
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	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.			

Living Things and their habitats:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Explore and compare the differences between things that are living, dead, and things that have never been alive		Recognise that living things can be grouped in a variety of ways	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 microorganisms, plants and animals.
	identify that most living		Explore and use	Describe the differences in	Give reasons for classifying

	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		classification keys to help group, identify and name a variety of living things in their local and wider environment	life cycle of a mammal, an amphibian, an insect and a bird	plants and animals based on specific characteristics.
	Identify and name a variety of plants and animals in their habitats, including micro-habitats.		Recognise that environments can change and that this can sometimes pose dangers to living things.		
	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.		Construct and interpret a variety of **food chains**, identifying producers, predators and prey.		

Animals, including humans

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Notice that animals, including humans, including humans, have offspring which grow into adults	identify that Animals, including humans, 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	Describe the simple **functions** of the basic parts of the **digestive system** in humans	Describe the changes as humans develop from birth to old age	Identify and name the main parts of the **circulatory system**, and explain the **functions of the heart, blood vessels and blood**.
Identify and name a variety of common animals that are **carnivores, herbivores and omnivores**	Find out about and describe the basic needs of Animals, including humans, for survival (water, food and air)	Identify that humans and some other animals have **skeletons and muscles** for support, protection and movement	Identify the different types of **teeth** in humans and their simple functions	Describe the life processes of **reproduction** in some **Animals, including humans** Describe the differences in the life cycles of mammal, amphibian, insect & bird	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
Describe and compare the	Describe the importance		Construct and interpret a		Describe the ways in which

structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	for humans of exercise, eating the right amounts of different types of food, and hygiene.		variety of food chains identifying **producers, predators** and **prey**		nutrients and water are transported within Animals, including humans,
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.					

Evolution & Inheritance

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		From 'The Earth (Rocks, Atmosphere): Describe in simple terms how **fossils** are formed when things that have lived are trapped within rock.			Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
					Identify how Animals, including humans and plants are adapted to suit their environment in different ways and that adaptation may lead to **evolution**
					Recognise that living things have changed over time and that **fossils** provide information about living things that inhabited the Earth millions of years ago.

Materials:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
distinguish between an	Identify and **compare** the		compare and group	compare and group	

object and the material from which it is made	suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses		materials together, according to whether they are solids, liquids or gases	together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets	
Identify and name a variety of everyday materials, including wood, metal, plastic, glass, metal, water and rocks	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretchin		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),	Know that some materials will **dissolve** in liquid to form a solution, and describe how to recover a substance from a solution.	
describe the simple physical properties of a variety of everyday materials			identify the part played by **evaporation and condensation** in **the water cycle** and associate the rate of evaporation with temperature	Use knowledge of solids, liquids and gases to decide how **mixtures** might be **separated**, including through filtering, sieving and evaporating	
compare and **group** together a variety of everyday materials on the basis of their simple physical properties				**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**	

Rocks					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Recognise that that **soils** are made from rocks and organic matter			
		Describe in simple terms how **fossils** are formed when things that have lived are trapped within rock.			
		Compare and group together **different kinds of rocks** on the basis of their simple physical properties			

Forces and magnetism					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Materials: Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare how things move on different surfaces		explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	
		Notice that some forces need contact between two objects, but magnetic forces can act at a distance		identify the effects of air resistance, water resistance and friction, that act between moving surfaces	
		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.		Recognise that some mechanisms, including gears, pulleys, levers and springs, allow a smaller force to have a greater effect	

		observe how magnets attract or repel each other and attract some materials and not others			
		Describe magnets as having two poles			
		Predict whether two magnets will attract or repel each other, depending on which poles are facing			

Light					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Recognise that they need light in order to see things and that dark is the absence of light			Recognise that light appears to travel in straight lines
		Notice that light is reflected from surfaces			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
		Recognise that light from the sun can be dangerous and that there are ways to protect their eyes			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.
		Recognise that shadows are formed when the light from a light source is blocked by a solid object			use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
		Recognise that they need light in order to see things and that dark is the absence of light			
		Find patterns that determine the size of shadows.			

Sound					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			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		

Electricity:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			identify common appliances that run on electricity		Use recognised symbols when representing a simple circuit in a diagram
			construct a simple series		associate the brightness

			electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
			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		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.
			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.		

Earth & Space					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Seasonal changes: observe changes across the four seasons				describe the movement of the Earth and other planets relative to the Sun in the solar system	
observe and describe weather associated with the seasons and how day length varies.				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.	