SCIENCE LONG-TERM PLAN

Nursery				
	Autumn term	Spring term	Summer term	End of year expectations
	To explore the natural world To begin to talk about their observations To begin to talk about themselves and their families. To know about different celebrations as they arise, Harvest, Diwali, Christmas To begin to understand life cycles – babies to adults, planting bulbs To explore and talk about different forces that they feel To explore light and dark To develop positive attitudes about the differences between people	To observe and talk about different materials and changes To learn about different countries in the world To learn about people who help us To talk about their past To plant seeds and care for growing plants Begin to talk about the differences between materials and changes that they notice. Show an interest in different occupations	To use all of their senses to explore the natural world To know that we have to be careful with animals and plants Begin to understand the key features of the life cycle of a plant and an animal	To know that there are different countries in the world and talk about the differences we have learnt about or those they have experienced. Continue to develop positive attitudes about the differences between people. To be aware of different occupations Begin to make sense of their own life-story and their family's history. To begin to understand the need to respect and care for the natural environment and all living things
Reception				
	Autumn term	Spring term	Summer term	
	Look at how they have changed from being a baby to now – bring in family/baby photos can they spot who is who Autumn walk – collect things related to autumn / look at what happens / record their observations through the term Look at animals that hibernate and why Nocturnal and diurnal animals Changing states of matter – water/ice chocolate melting making bread	Growing our own food – how does it change as it grows? What are really cold places around the world? How are they similar / different to where we live? Look at different animals in a zoo / farm / city Winter into spring comparisons Planting own seeds – look at how things grow and what they need – taking care of the environment (Charlotte Armah – healthy eating) Farm animals and their young	Compare the beach to where we live in the city Spring into summer comparisons Life cycle of a butterfly – observe the caterpillars change in the cycle and then release the butterflies into their natural habitat	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.

Underpinning subject context Yr1

Conditions for learning (CL): Observing everyday phenomena to encourage children to question what they see; zooming in and out; using simple tools eg binoculars, magnifying glasses, measuring tapes; encouraging curiosity about the world beyond their day to day lived experience, through reading and online resources and visits.

Learning for Social Mobility (LSM): recognising how natural phenomenon has to be cared for by people and how it can be useful when adapted by people; associated professions and trades including medicine, zoology, geology, map making, health and fitness, travel, town/city planning, environmental planning, forestry, carpentry, art work, brick manufacturing, stone masonry, road, rail, air and sea transport, fishing

Learning for Spirituality (LS): Developing a sense of curiosity and awe by encouraging children to learn about and observe the world around them; considering scientific explanations for everyday phenomena, whilst recognising and respecting there may be religious explanations too

Learning for morality/character/values (LMCV): Being respectful and caring about natural phenomena; recognising that all things are precious in some way; thinking about the impact of humans on the environment and to what extent we can control the future of our planet

Learning for Knowledge acquisition (LKA): Regular knowledge review; cross-curricular links

Learning for Language (LL): Scientific vocabulary taught explicitly and reviewed regularly

Year 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)		Theme/ Concept (NC)	
	Theme: Think Big **Concept:** Investigation: Human growth over time (ongoing all year). Human body parts Why are some people giants? Identifying and classifying: The world's largest tree, flower, grass, seaweed The world's largest land creatures - including insects, arachnids, molluscs, mammals and reptiles. The world's largest water/sea creatures - including amphibians, fish and mammals.	**Theme:** Into The Woods **Concept:** Observe changes across the four seasons (ongoing for remainder of year) Length of days in different seasons Learn about the woodland as a habitat for living things. Understand their interdependence. Identify and classify common UK trees and woodland creatures. Identify and name the main parts of trees and the body parts of some creatures. Learn which trees are deciduous or evergreen and how the seasons affect them. Learn which creatures are	**Theme:** Rags to Riches - Castles **Concepts:** Investigation: Human growth over time (continued). Observe changes across the four seasons (continued) Identify and classify materials used in the construction of castles. Use their knowledge of the properties of wood to reason about its use. Learn that there are different types of stone with different properties – chalk, sandstone, slate, granite Learn that bricks are made using natural materials Investigate some of the properties of stone and brick. Reason about its use for building. Observing a castle/ruin. Investigate and identify different types of beans. Identify parts of a broad bean plant and understand stages in its growth. Investigate by planting seeds, observing and caring for them (continues in summer term).		**Theme:** From the city to the seaside **Concepts:** Investigation: Human growth over time (completed). Observe changes across the four seasons (completed). Observing and caring for broad bean plants. Identify materials that constitute or can be found on the ground – grass, concrete, rock, stones, wood, mud, sand, ice astroturf, artificial grass etc Investigate which of the surface materials in the school grounds will easily allow a skateboard to travel over it. Learn the similarities and differences between weeds, pondweeds and seaweeds. Investigate types of weeds and understand why they can be unpopular. Learn that pondweeds grow in different parts of a pond. Understand their effect on other pondlife. Learn of the importance of seaweeds. Identify and name the parts of a seaweed. Understand that a huge number and wide variety of plants/algae fit into each of these 3 categories.	

	The world's largest birds - including ducks and flightless Birds.	carnivores, herbivores or omnivores. Investigation: Properties of wood. How is it useful? Why does it need to be replenished? Visit a woodland area.				
<u>Underpinning g subject context Yr2</u> Conditions for learning (CL): Field trips, First hand observations of plants/animals Learning for Social Mobility (LSM): Careers in the field of science (David Attenborough) Learning for Spirituality (LS): First-hand experiences (field trips, lifecycle of a butterfly) Learning for morality/character/values (LMCV): Being considerate towards animals and plants Learning for Knowledge acquisition (LKA): Spiral curriculum, cross-curricular links Learning for Language (LL): Scientific vocabulary is taught explicitly and reviewed regularly						
Year 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Theme: From Bugs to Beasts!		**Theme:** Food of the Gods		**Theme:** The Greatest Show	
	Texts: The Very Hungry Caterpillar by Eric Carle The Bog Baby by Jeanne Willis and Gwen Millward **Concept:** Identifying and classifying minibeasts Explaining how a minibeast (caterpillar) is suited to its habitat Describing the lifecycle of a butterfly Comparing living things (butterflies and moths) Making scientific observations (whole	**Texts:** Gorilla by Anthony Browne The Spider and the Fly by Tony DiTerlizzi Zerraffa Giraffa by Dianne Hofmeyr and Jane Ray **Concept:** Identifying how animals are suited to their habitat Understanding simple food chains Setting up simple investigations Recording results Knowing the importance of a balanced diet for humans	**Texts:** The Glassmaker's Daughter by Dianne Hofmeyr Chocolate: from bean to bar by Anita Ganeri A chocolate bar by Sarah Ridley Chocolate: A sweet history by Sandra Markle Ideas box **Concept:** Understanding how a tree (cacao) grows and stays healthy Understanding lifecycles-cacoa tree Changing state-chocolate Understand how to plan and carry out a fair test Explore and describe the way some everyday materials	**Texts:** Charlie and the Chocolate Factory by Roald Dahl **Concept:** Gather and record data to help in answering a simple question-materials Identifying and comparing the suitability of everyday materials *(plastic, foil and cardboard).* Carry out a simple investigation-materials	**Texts:** Ahmed and the Feather Girl by Jane Ray Peter Spier's 'Circus!' Expert pack about the history of the circus **Concept:**	**Texts:** Leon and the Place Between **Concept:** Describing the importance of exercise for humans. Materials properties assessment Describing animal adaptations

	fruit/vegetable vs cross-section) Understanding the nutrients in food Understanding the cycle between living and dead (plants and animals) Defining characteristics of something that is alive Categorising living, dead and never been alive		change when they are heated or cooled-chocolate Observing decay in food			

Underpinning subject context Yr3
Conditions for learning (CL): Oracy, Collaboration
Learning for Social Mobility (LSM): Hands-on work allows children to develop an appreciation for the work of scientists
Learning for Spirituality (LS): Hands-on investigative work
Learning for morality/character/values (LMCV): Being considerate towards animals and plants
Learning for Knowledge acquisition (LKA): Spiral curriculum
Learning for Language (LL): Scientific vocabulary is taught explicitly and reviewed regularly

Year 3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)
	Theme: Building a Civilisation **Text:** Black Dog The Tear Thief **Concept**: Grouping together different kinds of rocks based on their appearance Comparing and grouping together rocks based on their properties - WS: Making	**Theme:** Our Community: Highfields **Text:** Alice in Wonderland **Concept:** Identifying and comparing materials – looking at the suitability of everyday materials (opaque, transparent and translucent) Investigating the way seeds are dispersed Recognising that living things can be grouped in a	**Theme:** Latin and Londinium **Text:** Escape from Pompeii **Concept:** Friction: - What is a force - Which surfaces creates different amount of friction Identifying and describing the functions of different plant parts Exploring the requirements of plants	**Theme:** **Text:** The Great Kapok Tree **Concept:** Exploring the part that flowers play in the life cycle of flowering plants	**Theme:** Rivers and Plains **Text:** Treasure Island **Concept:** Introducing Magnets Using results to draw simple conclusions Identifying that human and some other animals have skeletons Purpose of a skeleton	**Theme:** Environment: World in danger **Text:** King Arthur **Concept** Exploring the part that flowers play in the life cycle of a plant Making systematic and careful observations Asking relevant questions and using different types of scientific enquiries to answer them

	systematic and careful observations Reporting on findings from an enquiry	Identifying how soil is formed Fossils Recognising that soils are made from rocks and organic matter				Finding patterns in the way that the size of shadows change Reporting on findings from enquiries

<u>Underpinning subject context Yr4</u>
Conditions for learning (CL): Oracy, Collaboration
Learning for Social Mobility (LSM): Shackleton (career options), Seaside and Sea Life Centre Trip
Learning for Spirituality (LS): Seaside and Sea Life Centre Trip, Botanical Gardens (flowers)
Learning for morality/character/values (LMCV): Climate change, Electricity (Frankenstein)
Learning for Knowledge acquisition (LKA): Spiral curriculum
Learning for Language (LL): Identifying key words, Latin etymology

Year 4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)

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	Theme: Anglo-Saxons and Vikings **Text:** The Hobbit **Concept:** Recognise that living things can be grouped in a variety of ways [vertebrates] Recognise that living things can be grouped in a variety of ways [invertebrates] Constructing and interpreting a variety of food chains	**Theme:** Ancient Greece **Text:** The Iliad **Concept:** Describing the functions of parts of the basic digestive system Using a classification key Identifying types of teeth and their simple function	**Theme:** Antarctica **Text:** Shackleton's Journey **Concept:** Living things- food chains and changes to environment Life processes Grouping materials States of matter Recording changes in states of matter	**Theme:** The Age of Enlightenment **Text:** Frankenstein's Monster **Concept:** • 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.	**Theme:** Ancient Baghdad **Text:** The Breadwinner **Concept:** • 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.	**Theme:** Ancient Sumer **Text:** The Epic of Gilgamesh **Concept:**
<u>Underpinning subject context Yr5</u> Conditions for learning (CL): Group work, Encourage children to ask questions, Watching recorded experiments Learning for Social Mobility (LSM): Using context of the novels studied, key scientific figures (Newton, Copernicus, Galileo and Kepler)						

Learning for Spirituality (LS): Magic in experiments (eg reversible and irreversible changes), Encouraging children to ask questions
Learning for morality/character/values (LMCV): Questioning scientific knowledge and belief (children's own personal and historic development)
Learning for Knowledge acquisition (LKA): Knowledge retrieval, Schema books
Learning for Language (LL): Recap of key scientific vocabulary in every lesson

Year 5	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1 and 2
	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)	Theme/ Concept (NC)
	Theme: N/A **Text:** Floodland **Concepts:** Exploring a range of reversible and irreversible reactions **<u>Working scientifically</u>** Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	**Theme:** N/A **Text: Richard III** **Concepts:** Grouping and classifying animals based on their characteristics. Describing animal life cycles and their differences. Exploring the role of DNA in inherited characteristics Understanding the process of reproduction in plants and animals. Using a range of scientific equipment to extract DNA from a banana. **<u>Working scientifically</u>** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with	**Theme: N/A** **Text: The Tempest** **Concepts:** Identifying the effects of water resistance and air resistance. Identifying how gears and levers can alter forces. Understanding how pulleys can alter forces.	**Theme:** N/A **Text:** The Odyssey **Concepts:** Understanding the effects of gravity and air resistance. Describing the movement of planets relative to the sun Understanding how the rotation of the Earth explains day and night	**Theme:** N/A **Text:** The Hound of the Baskervilles **Concepts:** Describing the changes in the human body as we age.

	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	increasing accuracy and precision, taking repeat readings when appropriate Identifying scientific evidence that has been used to support or refute ideas or arguments			

<u>Underpinning subject context Yr6</u>
Conditions for learning (CL): Collaboration, Oracy, Focus on sentence construction and improvement, Continuous evaluation of vocabulary within written and spoken language
Learning for Social Mobility (LSM): Acquisition of rich vocabulary, Exposition to STEM careers (biography of an inspirational figure; Intelligence Report)
Learning for Spirituality (LS): Engaging hooks for science lessons (Pepper's Ghost)
Learning for morality/character/values (LMCV): Analysing key themes (good vs evil, morality and immorality) and evaluating characters within books
Learning for Knowledge acquisition (LKA): Knowledge retrieval, Schema books
Learning for Language (LL): Clear emphasis on rich vocabulary

Year 6	Autumn	Spring	Summer	Summer
	Theme: Victorian England	**Theme:** British Empire	**Theme:** Transition	**Theme:** Transition
	Text: Great Expectation Writing text type: Wills/ Biography **Concept:** Light • explaining how we see things • explaining how we see colour • planning and conducting a scientific investigation – fair test (coloured filters) • explaining how we see things in mirrors - the law of reflection • understanding how light can be manipulated to create a hologram - Pepper's Ghost	**Text:** Murder at the Mushaira **Concept:** Living things and their habitats • 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 Evolution and inheritance • recognise that living things have changed over time and that fossils provide information about	**Text:** Lord of the Flies **Concept:** Animals including humans • 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	**Text:** Old man and the sea **Concept:** Electricity • 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

		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	• describe the ways in which nutrients and water are transported within animals, including humans Light • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram