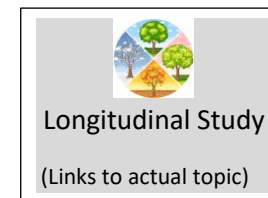




Otterbourne CE Primary School -SCIENCE

Curriculum Map, Progression and Golden Threads



Curriculum Map

Concepts to know and remember

Biology		Physics	Chemistry
	Autumn Term	Spring Term	Summer Term
Year R	Environmental changes and seasons, identifying trees and animals in our school environment  Big Question: Who am I? To develop my own personality, recognising what makes me special. Appreciate that everyone is unique and their differences and similarities can be celebrated. Share own scrapbooks, key person and home visit gallery photos alongside stories that celebrate the unique child. Ensure learning environment (focus on home corner and construction) has resources that reflect children's interests. To identify familiar people in their lives and talk about themselves in a positive way.	How things work, materials and forces  Big Question: How can we help? To develop an understanding and respect for people who help us. Identify special roles and responsibilities. Explore role of scientists who are saving the world. Understand the principle of all taking responsibility for the safety of the planet. Take responsibility for RRR in school. We are eco heroes. To talk about how they can impact on the world in which they live.	Life Cycles Animal and human habitats  Big Question: How does it grow? To recognise that plants and animals grow and that the life cycles differs for each one. Show care and attention to the needs of a range of living things. Involve children in the care of eggs and chicks, frog spawn and tadpoles, seeds and sunflowers, seedlings and vegetables. Ensure the environment is rich in visual prompts and books to show different species of plants and animals. Re-visit areas within school to observe seasonal changes. To identify similarities and differences in the natural world including seasonal changes, growth and lifecycles.
Aspiration	Aspiration 1: TRUST Sustainability and Change We will foster a love and care for nature through outdoor education and an environment rich in bugs, birds, plants and growing, where we compost our waste and grow vegetables that we can eat. We will be earth warriors and recognise the impact of our footprint on the planet. We will plan, grow and look after an insect friendly garden, and talk about the visiting wildlife, and changes observed over time.		
Assessment	Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.		

Year 1	Science skills. Trees  ➤ What is a scientist? ➤ Basic science skills ➤ The scientific method ➤ Equipment: name it, use it! ➤ Longitudinal study. ➤ Planting a seed. ➤ Tree identification. ➤ Planning an acorn experiment. ➤ Tree seeds experiment. ➤ Oak tree passport. ➤ Sycamore seed experiment. ➤ Longitudinal study.		Materials  ➤ Identifying materials and understanding why materials are important. ➤ Understanding properties: twisted, stretched, bent, squashed. ➤ Looking at bee hive hexagonal strength as an example of increasing strength of a fragile materials by folding ➤ Egg drop practical: ➤ Absorbency Practical.	Classification and Humans  ➤ Learning that there are a variety of animals, that animals have special features to help them survive, move, find a mate ➤ Grouping animals based on similarities and differences ➤ Identifying and comparing structures of animals. ➤ Identify body parts and sense organs discovering senses. ➤ Comparing humans to other animals: what senses do we have?	Animals and their survival  ➤ Invertebrates (and our own painted lady caterpillars) ➤ Meeting MORE Invertebrates. ➤ What are Invertebrates eating in our meadow AND where are they living? ➤ Introducing food chains and habitats. ➤ Making a map of feeding relationships in our school grounds. ➤ Linking food chains to habitats.	Animals including Humans ➤ to understand what animals need to survive ➤ to understand adults have young. ➤ life cycles. ➤ human life cycles ➤ health, hygiene and exercise.
Assessment Knowledge Skills	To name native trees (oak, ash, white beam, willow, lime and silver birch) WS4. To be able to show through diagram that an oak tree supports squirrels, magpies and oak wasps.		. To identify, name, and sort materials such as wood, metal, plastic, leather, wool, cotton.	To identify, name, draw and label the basic parts of the human body specifically head, arm, leg, elbow shoulder, knee. To say which part of the body is associated with each sense.	To create a simple 3 link food chain, made from observations in the meadow naming a herbivore and a carnivore. To use ideas about food chain links to explain what will happen if one of the chain increases or decreases.	To be able to discuss that animals, including humans, have offspring which grow into adults and give an example.
Working Scientifically KS 1	WS 1 To ask simple questions and know they can be answered in different ways. WS 2 To look closely using simple equipment. WS 3 To do tests. WS 4 To name and group. WS 5 To use observation and ideas to suggest answers to questions. WS 6 To collect and record simple data to help answer a question.					
Year 2	Exploring Habitats 	Staying Healthy 	Materials and Properties  ➤ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ➤ Begin to use tables.	Pushes and Pulls	Identifying Plants and Growing Healthy Plants  ➤ Concluding what plants need. ➤ Fruits and fruiting plants ➤ Fruits can come from trees or plants. ➤ Bee Day Conclusion	

			➤ describe the simple physical properties of a variety of everyday materials. ➤ materials suitable for mending a green house.) ➤ materials suitable for mending a hole in an umbrella. ➤ Litter Pick Challenge: Collect rubbish from the school grounds and classify the material.			
Assessment Knowledge Skills	To be able to discuss why a tiger wouldn't survive in our meadow using secondary sources.	To make a labelled diagram to show the life cycle stages of a rabbit	To record which material lets through water. To identify which material is best for an umbrella with a sensible reason.	To observe similarities and difference about how things move, naming a push or a pull.	To identify and name a variety of common wild including dandelion, primrose, buttercup, celandine, bluebell, foxglove. To name deciduous and evergreen trees such as oak and holly. To identify and describe the basic structure of common flowering plants, naming petal, stem, bud, pollen.	
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Year 3/4 Cycle A	How animals move •Grouping animals - NC: recognise that living things can be grouped in a variety of ways; •Classification •Identification keys: making and using them. - NC: explore and use classification keys to help group, identify and name a variety of living things in the local •Trailblazing: making and testing keys from outdoor samples. •Testing keys outside: •Skeletons and making a limb •Animal skeletons and adaptations to their habitat	Teeth and Eating 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. 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 .	Food Chains  • I can 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. • I can construct and interpret a variety of food chains, identifying PRODUCERS, PREDATORS and PREY. • I can identify a food chain in school environment and look at how it changes through the year (e.g. focus on birds). • I can explain why different food chains occur in different habitats.	Parts of plants 	Plants continued 	Solid, Liquid , Gases 
Assessment Knowledge Skills	To make and use identification keys to identify	To make observations and predictions about diet based on teeth	To draw a food chain and correctly label a producer, primary consumer, secondary consumer, omnivore, herbivore, carnivore.	To make accurate measurements a plants growth during a plant practical enquiry.	To collect data about seed dispersal and show in a results table.	To discuss the water cycle or forms of water and correctly use the terms

	the 5 vertebrate groups.	structure a range of model skulls.	To make a bar chart to show distribution on predator/prey or creatures in the pond.			evaporation, condensation, freezing, melting
Working Scientifically	WS 1 To ask questions and use different types of scientific enquiries to answer them WS 2 To set up simple practical enquiries, comparative and fair tests. WS 3 I can make observations and take measurements using standard units, using a range of equipment, including thermometers and data loggers. WS 4 To gather, record, classify and present data in a variety of ways to help in answering questions. WS 5 To record findings using simple scientific language, drawings, labelled diagram, keys, bars and tables. WS 6 To report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions. WS 7 To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. WS 8 To explain differences, similarities or changes related to simple scientific ideas and processes. WS 9 To use scientific evidence to answer questions or to support my findings.					
Year 3/4 Cycle B	Rocks  ➤ Earth structure, strata, volcanoes, ➤ light touch on soils as part of crust. ➤ Fossils, Being Paleontologists ➤ Fossil sandwich Practical ➤ The 3 rock types ➤ Being geologists ➤ Investigate water absorbency in rocks ➤ Uses of rocks at the church	Environmental change and Habitats  ➤ What is soil and how is it made? ➤ Testing soils ➤ Food chains and interdependence. ➤ Research on environmental change and the effect of flood and drought. ➤ Research on environmental problems. ➤ Vivariums: making a habitat and testing environmental problems on it.	Magnets  ➤ 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. ➤ Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. ➤ Testing if magnets can exert their magnetic field through different materials. ➤ OUTDOOR LEARNING OPPORTUNITY: to make our own compass.	Using Electricity ➤ What is electricity? ➤ Understanding circuits, making them work, drawing them and naming the components. ➤ Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ➤ Finding Insulators and conductors ➤ Billy Goat Gruff Investigation.	Light and Shadows  ➤ Discovering Light ➤ Light can be dangerous. ➤ Understanding shadows. ➤ Changing shadows. ➤ Understanding Reflection.	Changing Sound  ➤ Sound is a vibration ➤ Sound travels through different substances. ➤ How does the ear work. ➤ Investigating volume. ➤ Investigating pitch
Assessment Knowledge Skills	To make systematic observations of rocks using descriptive language.	To have sound knowledge of environmental change, effects of drought and flooding.	To describe magnets as having two poles. To predict whether two magnets will attract or repel each other, depending on which poles are facing.	To design a test using a circuit to answer a self-generated question about Billy Goat Gruff.	To recognise that shadows are formed when the light from a light source is blocked by a solid object.	To design a test to prove sound gets fainter as the distance from the source increases using handmade instrument

	To follow the hardness scale to rate a rocks hardness.		To make a compass.		To find patterns in the way that the size of shadows change.	and sound monitors to measure volume.
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Year 5/6 Cycle A	Variation and Inheritance 	Evolution and Fossils	Classification RSPB bird watch  	Asexual reproduction 	Light	Electricity
Assessment Knowledge Skills	To use the peppered moth to explain that variation causes natural selection in the form of a sequential cartoon.	To understand the evolution of the horse by sequencing diagrams and observing trends.	To compare data on the top 10 birds. To use and research bird identification colours.	To accurately test yeast in a range of temperatures and explain results based on asexual reproduction knowledge.	To use the hand held microscopes to make observations on a range of different surfaces. To make predictions using appropriate language about how much light will be reflected off surfaces based on their properties.	To solve simple electrical circuit problems using diagnostic questions and practical problem solving solutions.
Working Scientifically	WS 1 To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. WS 2 To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. WS 3 To record data and results using scientific diagrams and labels, classification keys, tables scatter graphs, bar and line graphs WS 4 To use test results to make predictions to set up further comparative and fair tests. WS 5 To report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations WS 6 To identify scientific evidence that has been used to support or refute ideas or arguments WS 7 To describe and evaluate my own and other peoples scientific ideas using evidence from a range of sources. WS 8 To group and classify things and recognise patterns. WS 9 To find things out using a wide range of secondary sources of information. WS 10 To use scientific language and ideas to explain, evaluate and communicate my methods and findings.					

Year 5/6 Cycle B	Life cycles 	Earth and Space 	How the body works	Materials and Matter	Air and Water resistance 	Simple Machines 
Assessment Knowledge Skills	To use scientific language and increasingly complex scientific diagrams to record information about life cycles, included distinction between phases and stages.	To look at scientific evidence that has been used to support or refute ideas or arguments and explain how the geocentric model of the solar system gave way to the heliocentric model.	To explore scientific research about the relationship between diet/exercise/lifestyle/drugs/health and summarise basic the effects on the way our bodies function.	To test the effects dissolving, Using knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	To use investigation skills to identify the effects of friction between moving surfaces in water.	To recognise what variables need to be controlled and if they can control them to measure the effectiveness of a catapult.
Working Scientifically	WS 1 To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. WS 2 To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. WS 3 To record data and results using scientific diagrams and labels, classification keys, tables scatter graphs, bar and line graphs WS 4 To use test results to make predictions to set up further comparative and fair tests. WS 5 To report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations WS 6 To identify scientific evidence that has been used to support or refute ideas or arguments WS 7 To describe and evaluate my own and other peoples scientific ideas using evidence from a range of sources. WS 8 To group and classify things and recognise patterns. WS 9 To find things out using a wide range of secondary sources of information. WS 10 To use scientific language and ideas to explain, evaluate and communicate my methods and findings.					

Golden Thread and Progression

THE INQUISITIVE MIND Enquiry based, discovery learning through practical hands on experiences.	THE SCIENTIFIC METHOD. Working scientifically	THE CYCLES OF LIFE Outdoor learning and Longitudinal Studies	THE IMPACTS OF SCIENCE AND SCIENTISTS Uses and Implications of science in the past, today and the future.
Year R	Observing, identifying	Outdoor Learning and discovering our grounds	
Year 1	Questioning, Observing, Identifying, Testing	Trees - How do trees change during a year?	Understanding current research on the importance of trees to climate change.
Year 2	Questioning, Observing, Testing, Recording	Bees - How many pollinators want to visit our school grounds? Why?	Implications of loss of natural habitats on pollinators.
Year 3/4 Cycle A	Questioning, Observing, Testing Fairly, Recording, Concluding	Ponds- What is the water quality of our pond?	Uses of keys and identification skills to assess water quality.
Year 3/4 Cycle B	Questioning, Observing, Testing Fairly, Recording, Concluding	Classifying and sampling animal species that visit our school grounds.	Understanding survey techniques and contributing to and analysing citizen science data.
Year 5/6 Cycle A	The Scientific Method -accuracy, using test results to make predictions and conclusions	Orchard - Do longer trees have more fruit? What variables affect the amount of fruit on a tree?	Mary Anning, Darwin, David Attenborough, Chris Packham Galileo Galillei - gravity and air resistance
Year 5/6 Cycle B	The Scientific Method -accuracy, using test results to make predictions and conclusions	Birds- mapping habitats and linking the interdependence of animals and plants.	David Attenborough, Chris Packham

		Which bird species visits our school grounds?	Galileo Galillei - astronomy, the telescope
IMPACT Supporting curiosity. Deepening questioning and problem solving. Critical thinking. Modelling and supporting thinking skills through metacognition.	IMPACT Progression of skills. Deepening questioning and problem solving. Critical thinking. Understanding the scientific method.	IMPACT Using our school grounds to investigate changing seasons, flora and fauna unique to our area and native to the UK. Identifying species through the year. Linked to and supported by scientific investigation and identification of flora and fauna in our school grounds.	IMPACT Mapping scientists through history. (outdoor timeline) Celebrating modern scientists/modern messages.
THE INQUISITIVE MIND 	THE SCIENTIFIC METHOD. 	THE CYCLES OF LIFE 	THE IMPACTS OF SCIENCE AND SCIENTISTS 