## Long term planning – science

Aims: The national curriculum for science aims to ensure that all pupils:

- ✓ develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- ✓ are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

#### Progression in working scientifically

Early Years	Years 1 & 2 (KS1)	Years 3 & 4 (LKS2)	
<ul> <li>Carry out simple investigations in a small group</li> <li>Explain why something happened and use this to predict what might happen next/change</li> <li>Identify, compare, classify and group a variety of places, objects, materials and living things</li> </ul>	<ul> <li>asking simple questions and recognising that they can be answered in different ways</li> <li>observing closely, using simple equipment</li> <li>performing simple tests</li> <li>identifying and classifying</li> <li>using their observations and ideas to suggest answers to questions</li> <li>gathering and recording data to help in answering questions</li> </ul>	<ul> <li>asking relevant questions and using different types of scientific enquiries to answer them</li> <li>setting up simple practical enquiries, comparative and fair tests</li> <li>making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	

# Science long term plan – rolling 2-year programme

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
21/22	22 School theme: Asia: China & Japan		English Queens Elizabeth I & II		Northumberland / Anglo Saxons	
KS1	<ul> <li>Everyday materials</li> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of a variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	<ul> <li>Seasonal changes</li> <li>observe changes across the four seasons</li> <li>observe and describe weather associated with the seasons and how day length varies.</li> <li>Although planned for Autumn for overview this is referred back to through the year as seasons change and direct observation is possible.</li> </ul>	<ul> <li>Living things and their</li> <li>explore and compare things that are living, have never been alive identify that most livit to which they are suit different habitats pro of different kinds of a how they depend on</li> <li>identify and name a v animals in their habit microhabitats</li> <li>describe how animals plants and other anin simple food chain, an different sources of ference</li> </ul>	habitats the differences between dead, and things that e ing things live in habitats ted and describe how ovide for the basic needs animals and plants, and each other variety of plants and rats, including s obtain their food from nals, using the idea of a and identify and name ood.	<ul> <li>Plants</li> <li>identify and name and garden plant evergreen trees</li> <li>identify and desc variety of common trees.</li> <li>observe and desc grow into mature</li> <li>find out and desc light and a suitab stay healthy. (Line)</li> </ul>	e a variety of common wild s, including deciduous and ribe the basic structure of a on flowering plants, including ribe how seeds and bulbs e plants ribe how plants need water, le temperature to grow and ok to seasonal changes)
KS2	<ul> <li>States of matter</li> <li>compare and group materials together, according to whether they are solids, liquids or gases</li> <li>observe that some materials change state when they are heated or cooled, and</li> <li>measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul> <li>Electricity</li> <li>identify common appliances that run on electricity</li> <li>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	Living things and their recognise that living the a variety of ways explore and use class group, identify and ne things in their local and recognise that environ that this can sometime things.	habitats things can be grouped in ification keys to help ame a variety of living nd wider environment inments can change and hes pose dangers to living	<ul> <li>Rocks</li> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>recognise that soils are made from rocks and organic matter</li> </ul>	<ul> <li>Plants</li> <li>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>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</li> </ul>

22/23	School theme	e: Farming and Food	School theme: Ancient Greece	People of Service / Mayans	
Plants (link to farming) Seasonal changes			Animals, including humans	Uses of everyday materials	
KS1	<ul> <li>identify and name a variety of common wild and garden and farming plants,</li> <li>find out and describe how crops need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<ul> <li>observe changes across the four seasons</li> <li>observe and describe weather associated with the seasons and how day length varies.</li> <li>Although planned for Autumn for overview this is referred back to through the year as seasons change and direct observation is possible.</li> </ul>	<ul> <li>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li> <li>identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<ul> <li>Review / introduce learning from everyday materials the previous year</li> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their physical properties.</li> <li>Then extend:</li> <li>identify and compare the suitability of a variety of everyday materials, including metal, plastic, glass, brick, rock, paper a cardboard for particular uses</li> <li>find out how the shapes of solid objects from some materials can be changed by squashing, bending, twisting and stretch</li> </ul>	of a of simple wood, and s made y hing.
KS2	Plants (link to farming)       Fc         • explore the requirements of crops 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 orycle of flowering plants.       •	brces 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 two poles predict whether two magnets will attract or repel each other, depending on which poles are facing.	<ul> <li>Animals, including humans</li> <li>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</li> <li>identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> <li>describe the simple functions of the basic parts of the digestive system in humans</li> <li>identify the different types of teeth in humans and their simple functions</li> <li>construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	LightSound• recognise that they need light in order to see things and that dark is the absence of light• identify how sou are made, associ some of them wi something vibrat o recognise that to recognise that light from the sun can be dangerous and that there are ways to protect their eyes• recognise that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque objectSound oidentify how sou are made, associ some of them wi something vibrat o recognise that the pitch of a sou and features of t object that produced it orecognise that sc get fainter as the distance from th sound source increases.	inds iating ith ting sounds ear tween und the uced it tween sound n of the ounds e ne

### Early Years links

Understanding the World	Key skills, knowledge and understanding	Early Learning Goals
Understanding the world involves guiding children to		The Natural World
make sense of their physical world and their	<ul> <li>Make simple predictions about what they think</li> </ul>	• Explore the natural world around them, making
community. The frequency and range of children's	might happen	observations and drawing pictures of animals and
personal experiences increases their knowledge and	<ul> <li>Carry out simple investigations in a small group</li> </ul>	plants.
sense of the world around them from visiting parks,	<ul> <li>Explain why something happened and use this to</li> </ul>	• Know some similarities and differences between the
libraries and museums to meeting important members	predict what might happen next/change	natural world around them and contrasting
of society such as police officers, nurses and	<ul> <li>Identify, compare, classify and group a variety of</li> </ul>	environments, drawing on their experiences and what
firefighters.	places, objects, materials and living things	has been read in class.
In addition, listening to a broad selection of stories,	<ul> <li>Talk about changes, including the seasons</li> </ul>	• Understand some important processes and changes
non-fiction, rhymes and poems will foster their	<ul> <li>Talk about their immediate environment and</li> </ul>	in the natural world around them, including the
understanding of our culturally, socially,	compare it to other environments	seasons and changing states of matter.
technologically and ecologically diverse		Listening, Attention and Understanding
world. As well as building important knowledge, this		Listen attentively and respond to what they hear
extends their familiarity with words that support		with relevant questions, comments and actions when
understanding across domains. Enriching and		being read to and during whole class discussions and
widening children's vocabulary will support later		small group interactions.
reading comprehension.		<ul> <li>Make comments about what they have heard and</li> </ul>
		ask questions to clarify their understanding.

### Next stage – Middle School coverage for UKS2

Υ5	What's going on inside us? Circulation, organs, impact of exercise, diet, drugs & lifestyle on the body.	<b>Can you feel the force?</b> Gravity, balanced and unbalanced forces, friction, resistance, application to machinery (pulleys / levers / gears).	How does age change us? Gestation, child development, puberty, aging.	What makes life 'circular'? Life cycles of plants and animals.	What on Earth is the time? Earth, Sun & moon – shape/size, day/night. Over a year Phases of the moon.	What good can materials do? Investigating different materials – focus on absorbency, hardness, conductivity and magnetism.
Y6	How do materials change? Reversible and irreversible changes.	Is electricity the best type of energy? Types of energy, renewable energy, circuits.	Why do we need classification systems? Plants and animals.	Are all microbes bad for us? Micro-organisms. Disease and vaccination.	How did we evolve? Fossils, variations, adaption, selection, evolution.	Why can we not see as well in the dark? How light travels, reflection, luminosity, diffusion.