SCIENCE
PROGRESSION DOCUMENT

Highfield Community Primary School

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At Highfield, we have two progression documents. Our 'Substantive Knowledge' is taken from the National Curriculum and is reflected on our 'Substantive Knowledge Progression Document'. Coverage is indicated on the table below. Our progression of scientific skills – 'Disciplinary Knowledge' - is reflected on the following progression document.

EYFS are an exception as much of their Substantive and Disciplinary Knowledge overlaps through continuous provision and therefore both progression journeys are reflected in this document.

'Working Scientifically' is taken from our national curriculum, however 'Scientific Enquiry' is added at Highfield to enhance the skills.

Coverage in blue	Seasonal changes	Everyday materials/ properties of materials	Living things and their habitats	Plants	Animals including humans	Rocks	Light	Forces and magnets	States of matter	Sound	Electricity	Earth and Space	Evolution and Inheritance
EYFS													
Year 1													
Year 2													
Year 3													
Year 4													
Year 5													
Year 6													

Disciplinary Knowledge Progression in EYFS

In the EYFS, the characteristics of effective learning from the Statutory Framework for the Early Years Foundation Stage are the foundations on which the working scientifically skills build in Key Stage 1. While children are playing and exploring, teachers should be modelling, encouraging and supporting them to do the following:

- Show curiosity and ask questions.
- Make observations using their senses and simple equipment.
- Make direct comparisons.
- Use equipment to measure. (Standard and non -standard)
- Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets.
- Use their observations to help them to answer their questions.
- Talk about what they are doing and have found out.
- Identify, sort and group.

Substantive Knowledge Progression in EYFS

The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for Science.

The most relevant statements for Science are taken from the following areas of learning:

- Understanding the world
- Communication and Language
- PSED
- Expressive Art and Design

EYFS Science Progression (Substantive)		
Three and Four Year-Olds	Communication and Language	Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	PSED	Make healthy choices about food, drink, activity and tooth brushing.
	Expressive Art and Design	Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures.
	Understanding the world	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.
Reception	Communication and Language	Learn new vocabulary. Ask questions to find out more and to check what has been said to them. Articulate their ideas and thoughts in well-formed sentences. Describe events in some detail. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.

		Use new vocabulary in different contexts.
	PSED	Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - tooth brushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
ELG	Communication and Language	Make comments about what they have heard and ask questions to clarify their understanding.
	PSED	Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Expressive Art and Design	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
	Understanding of the world	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.

Pre- National Curriculum				
Phase 1 (P4)	**Phase 2 (P5)**	**Phase 3 (P6)**	**Phase 4 (P7)**	**Phase 5 (P8)**
• I can show anticipation and choice making e.g. reaching out towards a favoured resource. • I can copy simple actions. • I can make sounds with my body. • I can explore objects and materials, change some materials by physical means and observe the outcomes. • I can communicate an awareness of changes in light, sound or movement. • I can cause movement by a pushing or pulling action. • I can show an interest in a wide range of living / non-living things. • I can handle and observe a wide range of living and non-living things.	• I can match objects by colour e.g. Autumn leaves • I can match objects by shape e.g. Animals • I can answer / respond to simple scientific questions e.g. 'Where is the flower, rock, water?' • I can try out a range of familiar equipment to explore living things e.g. magnifying glass, easiscope with a little help. • I can try out a range of familiar equipment to activate light sources e.g. turning a torch on/off • I can carry out simple instructions with a prompt e.g. push the car (adult to model the action) • I can answer simple scientific yes / no questions e.g. is it hot? / is it soft?	• I can recognise distinctive features of objects e.g. leaves on a tree, feathers on a bird • I can sort materials according to one single criterion e.g. hard / soft. • I can sort different surfaces e.g. rough / smooth • I can identify connections e.g. appliances that use electricity • I can make objects move faster. • I can recognise sources of light e.g. torch, candle, lamp, sun. • I can make simple predictions with a yes / no response e.g. will it move / change colour / melt? • I can carry out simple instructions independently.	• I can communicate observations using simple phrases e.g. ice gone • I can make simple records of my findings with visual support e.g. put pictures of plant life cycle in order • I can begin to respond to questions e.g. was that right or wrong? • I can use simple scientific vocabulary e.g. before, after, then, grow, move. • I can communicate my ideas using simple phrases. • I can name actions and events e.g. pulling / pushing, walking / running I can sort by a given criterion e.g. which animals live in water? • I can match objects of the same materials e.g. piece of plastic to a plastic bottle.	• I can identify a range of common materials / plants / animals / forces. • I can sort materials using simple criteria and talk about the properties e.g. the metal spoon is heavy, the plastic spoon is light. • I can make observations of / describe changes e.g. of cycles, light, sound or movement with a little help. • I can plan, evaluate and record my findings with adult support. • I can demonstrate I have observed patterns e.g. order life cycles. • I can explore and observe similarities, differences, patterns and changes in features of different objects, materials, living / non-living things and events • I can communicate observations through simple drawings which can be recognised.
	I can trial actions e.g. make sounds with objects / explore the effects of a torch.			I can describe changes when questioned directly.

Disciplinary Knowledge Progression

Working Scientifically (taken from NC)			
	KS1	**LKS2**	**UKS2**
	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: - Asking simple questions and recognising that they can be answered in different ways. - Observing closely, using simple equipment. - Performing simple tests. - Identifying and classifying. - Using their observations and ideas to suggest answers to questions. - Gathering and recording data to help in answering questions.	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: - Asking relevant questions and using different types of scientific enquiries to answer them. - Setting up simple practical enquiries, comparative and fair tests. - Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. - Recording findings using simple scientific language, drawings,	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: - 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 increasing accuracy and precision, taking repeat readings when appropriate - Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. - Using test results to make predictions to set up further comparative and fair tests.

		labelled diagrams, keys, bar charts, and tables. - Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. - Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. - Identifying differences, similarities or changes related to simple scientific ideas and processes. - Using straightforward scientific evidence to answer questions or to support their findings.	- 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. - Identifying scientific evidence that has been used to support or refute ideas or arguments.

Scientific Enquiry
Asking questions and recognising that they can be answered in different ways

KS1	LKS2	UKS2
Asking simple questions and recognising that they can be answered in different ways. • While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. • The children answer questions developed with the teacher often through a scenario. • The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.	Asking relevant questions and using different types of scientific enquiries to answer them. • The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. • The children answer questions posed by the teacher. • Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

Making observations and taking measurements		
KS1	**LKS2**	**UKS2**
Observing closely, using simple equipment. • Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • The children make systematic and careful observations. • They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
Engaging in practical enquiry to answer questions		
KS1	**LKS2**	**UKS2**
Performing simple tests. • The children use practical resources provided to gather evidence to answer questions generated by themselves or	Setting up simple practical enquiries, comparative and fair tests. • The children select from a range of practical resources to gather evidence	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

	the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Identifying and classifying. • Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	• The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
	Recording and presenting evidence		
	KS1	**LKS2**	**UKS2**
	Gathering and recording data to help in answering questions. • The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. • They classify using simple prepared tables and sorting rings.	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. • The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using

		can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. • Children are supported to present the same data in different ways in order to help with answering the question.	tables, Venn diagrams, Carroll diagrams and classification keys. • Children present the same data in different ways in order to help with answering the question.
	Answering questions and concluding		
	KS1	**LKS2**	**UKS2**
	Using their observations and ideas to suggest answers to questions. • Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.	Using straightforward scientific evidence to answer questions or to support their findings. • Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	Identifying scientific evidence that has been used to support or refute ideas or arguments. • Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered. • They talk about how new discoveries change scientific understanding.

	Using their observations and ideas to suggest answers to questions. • The children recognise 'biggest and smallest', 'best and worst' etc. from their data.	Identifying differences, similarities or changes related to simple scientific ideas and processes. • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • They draw conclusions based on their evidence and current subject knowledge.	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. • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
	Evaluating and raising further questions and predictions		
	KS1	**LKS2**	**UKS2**
		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	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. • They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data.

		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	Using test results to make predictions to set up further comparative and fair tests. • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
	Communicating their findings		
	KS1	**LKS2**	**UKS2**
		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	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. • They communicate their findings to an audience using relevant scientific language and illustrations.