

Building Science Skills

Statements taken from:

EEF (November 2021)

Science programmes of study: Key stage 1 and 2, National curriculum in England (2015)

DFE statutory framework for early years foundation stage (2021)

Science is a core subject and therefore provision should be equally as strong and frequent as literacy and maths. (Ofsted, 2019). There is currently an attainment gap in science at every stage: it is apparent at the end of KS1 and gets wider through primary and secondary education with the gap growing particularly strongly between the ages of 5-7. Strongest factor affecting pupils science is their literacy skills (difficulties understanding vocabulary in particular). There is strong evidence that the ability to reason scientifically – by having sound ‘working scientifically’ skills – is a strong predictor of later success in science. Pupils should therefore have ample opportunity to design and carry out their own experiments and investigations (EEF, 2019). Society depends on science to respond to pressing problems, from the Covid-19 pandemic to the climate crisis, so it is important to ensure the foundations for critical scientific literacy are laid in the primary school. Children should be provided with a science education that enables them to appreciate what science is, how it works, the social nature of its practices, and its relevance to the lives of individuals and society.

Developing working scientifically skills at Parkfield: There are three aims in the primary science curriculum 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 specific 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.

At Parkfield, we have developed Science Skills to support the children to understand the different ways to work scientifically. These are shared with the children in science lessons – and other relevant topics – so that they become familiar with the set of skills they are developing. Evidence for working scientifically is collected in a range of ways including EYFS Observations, Topic Books and floor books.

Pupils should be taught to:	Development of Disciplinary Knowledge						
	Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Work Scientifically <ul style="list-style-type: none"> • Ask simple questions and recognise they can be answered differently • Observe closely using simple equipment. • Perform simple tests. Identify and classify • Use their observations to suggest answers to questions • Gather and record data to 	Scientists in the Foundation Stage will: be encouraged through high quality continuous provision to have their own ideas and find ways to solve problems themselves. As part of the early year’s curriculum, FS children safely explore a range of materials, tools and techniques. High quality interactions with skilled adults support children to make links, notice	Working scientifically is a thread that runs throughout the Science Curriculum. During their time at Parkfield, children will have the opportunity to carry out their own simple tests, experiments and scientific enquiries. They will be introduced to key scientific vocabulary to enable them to make predictions and talk about their findings with their peers. From Spring Term 2020, each class will have a “Floorbook” in order to record the science learning from each class. This will include examples of work, pupil voice and evidence of working scientifically. The children will be introduced to the 6 areas of working scientifically through “Super Science Skills” which will be talked about in science lesson.					

<p>help answer questions</p>	<p>patterns and talk about things they have observed. Staff plan opportunities for independent and adult directed 'Understanding the world' opportunities across the curriculum. High quality teaching enables children to begin to develop their 'working scientifically' skills.</p>						
<p>Planning</p>	<p>Scientists in the Foundation Stage will: Choose the resources they need for their chosen activities and say when they do or don't need help. Have their own ideas Find ways to solve problems and find new ways to do things Make simple predictions Plan and make decisions about how to solve a problem or reach a goal</p>	<p>Scientists in year 1 will: Ask simple questions when prompted Suggest ways to answer a question</p>	<p>Scientists in year 2 will: Ask simple questions without needing to be asked. Recognise that questions can be answered in different ways.</p>	<p>Scientists in year 3 will: Ask relevant questions and use different types of scientific enquiry to answer them. Set up simple, practical enquiries, comparative and fair tests.</p>	<p>Scientists in year 4 will: Ask relevant questions and use different types of scientific enquiry to answer them. Set up simple, practical enquiries, comparative and fair tests.</p>	<p>Scientists in year 5 will: Plan different types of scientific enquiries to answer specific questions including recognising and controlling variables when needed.</p>	<p>Scientists in year 6 will: Plan different types of scientific enquiries to answer specific questions including recognising and controlling variables when needed.</p>
<p>Conducting Experiments</p>	<p>Scientists in the Foundation Stage will: Test their ideas. Safely explore a variety of materials, tools and techniques, experimenting with</p>	<p>Scientists in year 1 will: Observe closely, using simple equipment Identify and classify Perform simple tests</p>	<p>Scientists in year 2 will: Observe closely, using simple equipment Perform simple tests</p>	<p>Scientists in year 3 will: Make systematic and careful observations and where accurate take accurate measurements using standard units when using a range of scientific equipment</p>	<p>Scientists in year 4 will: Make systematic and careful observations and where accurate take accurate measurements using standard units when using a range of scientific equipment</p>	<p>Scientists in year 5 will: Take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate</p>	<p>Scientists in year 6 will: Take measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate</p>

	colour, design, texture, form and function. Know about similarities and differences in relation to objects, materials and living things. Make observations of animals and plants.			with increasing accuracy and precision.	with increasing accuracy and precision.		
Recording Evidence	<p>Scientists in the Foundation Stage will: Develop ideas of grouping, sequencing, cause and effect. Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.</p>	<p>Scientists in year 1 will: Gather and record data to help in answering questions</p>	<p>Scientists in year 2 will: Gather and record data to help in answering questions</p>	<p>Scientists in year 3 will: Gather, record, classify and present data in a range of ways to help answer questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p>	<p>Scientists in year 4 will: Gather, record, classify and present data in a range of ways to help answer questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p>	<p>Scientists in year 5 will: Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>	<p>Scientists in year 6 will: Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>
Reporting Findings and Conclusions and Predictions	<p>Scientists in the Foundation Stage will: Recognise findings and talk about what they have found out in simple terms. Talk about the features of their immediate environment and how environments might vary from one another. Explain why some things occur and talk about changes. Gather and record basic data alongside an adult e.g.</p>	<p>Scientists in year 1 will: Recognise findings and use their observations and ideas to suggest answers to questions – with support from an adult. Talk in simple terms about what they found out. This may be oral reporting only or supported written reporting.</p>	<p>Scientists in year 2 will: Recognise findings and use their observations and ideas to suggest answers to questions – with support from an adult. Talk in simple terms about what they found out. This may be oral reporting only or supported written reporting.</p>	<p>Scientists in year 3 will: Report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions. Use test results to make predictions to set up further comparative and fair tests. Identify scientific evidence that has been used to support or refute their findings. Use straightforward scientific evidence to</p>	<p>Scientists in year 4 will: Report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions. Use test results to make predictions to set up further comparative and fair tests. Identify scientific evidence that has been used to support or refute their findings. Use straightforward scientific evidence to</p>	<p>Scientists in year 5 will: Use test results to make predictions to set up further comparative tests Report and present 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 Identify scientific evidence that has been used to support or</p>	<p>Scientists in year 6 will: Use test results to make predictions to set up further comparative tests Report and present 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 Identify scientific evidence that has been used to support or</p>

	observational drawing / scribed pupil voice. Use their observations to suggest simple answers to basic questions, with the necessary scaffolding from an adult.			answer questions or to support their findings	answer questions or to support their findings	refute ideas or argument	refute ideas or argument
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