

Working Scientifically at Hindhayes - Skill Progression (Disciplinary Knowledge)



Hooked on Thinking Working With and For Local Families

Recent research shows us that:






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).

Developing working scientifically skills at Hindhayes: 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 Hindhayes, we have developed ‘Super 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, Forest School observations, Topic Books and Floorbooks.



Pupils should be taught to:	Development of skills	Foundation Stage	Year 1	Year 2	Further Primary Outcomes
<h3>Work Scientifically</h3> <p>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 help answer questions</p>	<p>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 years curriculum, FS children safely explore a range a materials, tools and techniques. High quality interactions with skilled adults support children to make links, notice 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 forest school provision and teaching enables children to begin to develop their ‘working scientifically’ skills.</p>	<p>Working scientifically is a thread that runs throughout the Science Curriculum. During their time at Hindhayes, 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>			
<h3>Planning</h3> <p>Ask questions, make predictions, decide on the method and the equipment</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. Listen attentively and respond to what they hear with relevant questions. 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 Developing the skill of suggesting ways to answer a question using appropriate vocabulary e.g. “I think that _____ because _____”. Making use of question and answer stems with guidance from adults</p>	<p>Scientists in Year 2 will: Ask simple questions without needing to be asked by an adult. Recognise that questions can be answered in different ways and use a variety of language and appropriate scientific vocabulary to express thoughts.</p>	<p>KS2 scientists will: Ask relevant questions and use different types of scientific enquiry to answer them. Set up simple, practical enquiries, comparative and fair tests. Plan different types of scientific enquiries to answer specific questions including recognising and controlling variables when needed.</p>	
<h3>Conducting Experiments</h3> <p>Carry out an enquiry using equipment Measuring (linking to maths)</p>  	<p>Scientists in the Foundation Stage will: Test their ideas. Safely explore a variety of materials, tools and techniques, experimenting with 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. Freely explore simple equipment e.g. magnifiers, capacity containers, torches & light up toys.</p>	<p>Scientists In Year 1 will: Developing the skill of making relevant observations using stage appropriate vocabulary (key vocabulary documented for each year group) – some adult modelling and support required. Conduct simple tests with support. Identify and classify in simple terms (Basic grouping and matching) Use non-standard units of measurement</p>	<p>Scientists in Year 2 will: Confidently observe closely using simple equipment. Perform simple tests with an appropriate level of modelling/support. Confidently Identify and classify – some may decide own categories. Begin to use standard units of measurement.</p>	<p>KS2 scientists will: Make systematic and careful observations and where accurate take accurate measurements using standard units when using a range of scientific equipment with increasing accuracy and precision.</p>	
<h3>Recording Evidence</h3> <p>Use drawings, tables or graphs to note observations and measurements.</p> 	<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. Be exposed to simple data collection methods with the support of an adult e.g. pictogram / tally chart.</p>	<p>Scientists In Year 1 will: With prompting, suggest how findings could be recorded and record them with support – this could be through scaffolded whole class/group recording (could be text, simple labelled diagrams, pictures, photographs, simple prepared tables)– help to make decisions about what data to collect and why Gather and record simple data to help answer questions using non-standard units with support</p>	<p>Scientists in Year 2 will: Record and communicate their findings in a range of ways and begin to use simple scientific language. This may include simple text, block diagrams, simple labelled diagrams, pictograms, pictures, photographs, tally charts, simple tables – initially modelled by an adult. May be some whole class/group recording.</p>	<p>KS2 scientists 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>	
<h3>Reporting Findings</h3> <p>Communicate results</p> 	<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 – with appropriate support and questioning from an adult.</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, pupil voice collected.</p>	<p>Scientists in Year 2 will: Identify and classify their findings where appropriate. Confidently be able to talk about their findings and suggest simple reasons for why they occurred. This may be oral reporting only or supported written reporting.</p>	<p>KS2 scientists will: Report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions. Use tests 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.</p>	
<h3>Conclusions and predictions</h3> <p>Interpret and evaluate results</p>	<p>Scientists in the Foundation Stage will: Gather and record basic data alongside an adult e.g. observational drawing / scribed pupil voice. Use their observations to suggest simple answers to basic questions, with the necessary scaffolding from an adult. Be exposed to simple data collection methods with the support of an adult e.g. pictogram / tally chart – talk, with support, about what these methods show us.</p>	<p>Scientists In Year 1 will: Use their observations and simple data to suggest answers to questions – with adult support and direction. Develop the skill of talking about why things happened in simple terminology. Making use of sentence stems, question stems and answer stems to draw simple conclusions with support from an adult.</p>	<p>Scientists in Year 2 will: Use their recording and data to help answer simple questions. Use their observations and own ideas to help them answer questions. Talk in more detail about why things happened using appropriate scientific vocabulary.</p>	<p>KS2 scientists will: Use their findings to draw conclusions and use scientific evidence to answer questions about their conclusions. Use their findings to help explain conclusions and begin to understand the degree of trust in results.</p>	