

The Pines School Progression of Skills – Science

Key area	EYFS	Year 1 & 2	Year 3 & 4	Year 5 & 6
WORKING SCIENTIFICALLY	<p><i>In Early Years, our children will start to gain the science knowledge that they'll build on; developing their skills of observation, prediction, critical thinking and discussion.</i></p> <p>By the end of Foundation Stage our children will...</p>	<p><i>In Year 1 and 2, our children will be able to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.</i></p> <p>By the end of Year 2 our children will...</p>	<p><i>In Year 3 and 4, our children will be enabled to broaden their scientific view of the world around them through exploration, discussion, investigation and development of ideas regarding everyday phenomena and the relationships between living things and familiar environments.</i></p> <p>By the end of Year 4 our children will...</p>	<p><i>In Year 5 and 6, our children will be enabled to develop a deeper understanding of a wide range of scientific ideas through exploring and talking about their own ideas about scientific phenomena.</i></p> <p>By the end of Year 6 our children will...</p>
QUESTION & ENQUIRE	<ul style="list-style-type: none"> respond to what they hear with relevant comments or questions 	<ul style="list-style-type: none"> have their curiosity sparked ask simple questions raise their questions from exploring the world around them ask questions about what they notice enquire how to answer their own questions 	<ul style="list-style-type: none"> be curious ask relevant questions raise their own questions about the world around them from being given a range of scientific experiences ask their own questions from what they observe develop their ideas about functions, relationships and interactions e.g. <ul style="list-style-type: none"> What is the relationship between where the root is and what it does? What do you think is the function of a human skeleton? What do you think will happen to water if we cool/heat it? (interaction) 	<ul style="list-style-type: none"> use their curiosity to independently make discoveries ask their own questions about scientific phenomena encounter and question more abstract ideas, beginning to recognise how these ideas help them to understand and predict how the world operates explore ideas and raise different kinds of questions analyse functions, relationships and interactions more systematically e.g. <ul style="list-style-type: none"> What do you think are the functions of the main body systems and how do they fit together? What does an eco-systems need to survive? What do the interactions of reversible and irreversible changes mean for the world?

<p>PLAN</p>	<ul style="list-style-type: none"> choose the resources they need for their chosen activity 	<ul style="list-style-type: none"> recognise questions can be answered in different ways discuss their ideas about how to find things out understand and use different types of scientific enquiry including... <ul style="list-style-type: none"> -observing changes over a period of time -noticing patterns and relationships -grouping and classifying things -planning simple comparative tests - researching using simple secondary sources 	<ul style="list-style-type: none"> make some decisions about the most appropriate scientific enquiry that will best answer their questions recognise when a simple fair test is necessary help to decide how to set up a simple fair test help make decisions about what they will be observing and measuring, how long for and what simple equipment they might use plan to use different types of scientific enquiry to answer their questions <ul style="list-style-type: none"> -observing changes over time -noticing patterns and relationships -grouping and classifying things -planning simple practical, comparative and fair tests - researching using secondary sources 	<ul style="list-style-type: none"> select and plan the most appropriate type of scientific enquiry to use in order to answer scientific questions recognise when to plan comparative and fair tests be able to plan how to set up a comparative and fair test make decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary <ul style="list-style-type: none"> -observing changes over different periods of time -noticing patterns and relationships -grouping and classifying things -planning comparative and fair tests - researching using a wider range of secondary sources
<p>DO</p> <p><i>Investigate</i></p>	<ul style="list-style-type: none"> handle equipment and tools effectively select and use technology for particular purposes 	<ul style="list-style-type: none"> perform simple tests perform simple comparative tests say what they are doing during their investigations say what they are looking for and measuring find information to help them from books and computers with help 	<ul style="list-style-type: none"> set up simple practical enquiries set up simple comparative and fair tests say what they are doing during their investigations and if necessary, why it needs to be a fair test understand that there could be more than one variable factor recognise when and how secondary sources might help them answer questions 	<ul style="list-style-type: none"> set up practical enquiries set up comparative and fair tests say and record what they are doing during their investigations and why, if appropriate, they chose it to be a fair test explain which variables need to be controlled and why recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

**Observe
&
Measure**

- ✿ make observations of animals and plants

- ✿ be able to observe closely, using simple equipment
- ✿ be able to observe changes over time
- ✿ use simple measurements and equipment safely, with increasing independence, to gather data
 - hand lenses
 - egg timer (minutes)
 - rulers and metre sticks (cm, m)
 - scales (g, kg)
 - measuring vessels (ml, l)
 - thermometers (°C)

- ✿ make systematic and careful observations, using a range of equipment
- ✿ be able to, with increasing independence, make observations at regular intervals for their chosen period of time using their chosen simple equipment
- ✿ use standard units to take accurate measurements using a range of equipment safely to gather data
 - stop watches/clocks (seconds, minutes, hours, days)
 - rulers and metre sticks (mm, cm, m)
 - scales (g, kg)
 - measuring vessels (ml, l)
 - thermometers (°C)
 - data loggers (light, sound)
 - area (cm²)

- ✿ make increasingly systematic and sets of observations by choosing to use the most appropriate equipment from a scientific range and explain how to use it accurately
- ✿ be able to, with independence, make observations at regular intervals for their chosen period of time, taking repeat readings where appropriate
- ✿ take measurements, with increasing accuracy and precision, using a range of equipment safely to gather data
 - stop watches/clocks (milliseconds – where appropriate, seconds, minutes, hours, days, weeks & km/h, m/sec)
 - rulers, metre sticks & trundle wheels (mm, cm, m & inches)
 - scales (g, kg & pounds)
 - measuring vessels (ml, l & pints)
 - thermometers (°C)
 - data loggers (light, sound, temperature)
 - area (cm², m²)
 - force meters (N)
 - voltmeters (V)

<p>Pattern Seek</p>	<ul style="list-style-type: none"> know similarities and differences in relation to places, objects, materials and living things 	<ul style="list-style-type: none"> with guidance, begin to notice patterns and relationships use simple features to identify, compare and describe objects, materials and things with help, be able to decide how to sort and group things 	<ul style="list-style-type: none"> begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them see a pattern in their results identify differences, similarities or changes related to simple scientific ideas and processes discuss criteria for grouping, sorting and classifying with simple keys compare or group things based on testing, according to behaviour and properties 	<ul style="list-style-type: none"> identify patterns that might be found in the natural environment interpret data and find patterns use and develop keys and other information records to identify, classify and describe living things and materials
<p>RECORD</p>	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. 	<ul style="list-style-type: none"> gather data to help suggest answers to their questions record simple data record written results in a format provided by the teacher record and communicate their findings in a range of ways including... <ul style="list-style-type: none"> simple pictograms tally charts tables block diagrams 	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help answers their questions record data using standard units help make decisions about how to record results record and communicate their findings, using simple scientific language, in an increasing range of ways, including... <ul style="list-style-type: none"> drawings labelled diagrams keys tables pictograms bar charts (scaled) time graphs 	<ul style="list-style-type: none"> gather, record, classify and present results of increasing complexity in a wide range of ways to answers their questions record data using standard units of metric and some imperial measurements decide how to record data from a choice of familiar approaches decide how to best present their data record and communicate their findings, using scientific language, in an increasingly complex range of ways, including... <ul style="list-style-type: none"> labelled scientific diagrams classification keys tables bar charts (scaled) line graphs & scatter graphs pie charts mean averages

<p>REVIEW</p>	<ul style="list-style-type: none"> answer 'how' and 'why' questions about their experiences talk about the features of their own immediate environment and how environments might vary from one another 	<ul style="list-style-type: none"> say what happened in their investigation compare and order simple measurements including... <ul style="list-style-type: none"> lengths (cm, m) mass (g, kg) volume/capacity (ml, l) temperature (°C) say what they found out and how they found out use their observations and ideas to suggest answers to questions use simple secondary sources (<i>photos, books and videos</i>) to find answers identify and classify using their scientific enquiry begin to use simple scientific language to talk about what they have found out 	<ul style="list-style-type: none"> help decide how to analyse their data interpret discrete and continuous data compare, order, add and subtract and convert some measurements including... <ul style="list-style-type: none"> lengths (mm, cm, m) mass (g, kg) volume/capacity (ml, l) temperature (°C) time (seconds, minutes, hours) say what they found out linking cause and effect report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use their results to draw simple conclusions use secondary sources (<i>photos, books and videos</i>) to find answers identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or support findings 	<ul style="list-style-type: none"> decide how to analyse their data interpret discrete, continuous and comparison data compare, order, add and subtract and convert each way between measurements including... <ul style="list-style-type: none"> lengths (mm, cm, m, km & miles) mass (g, kg) volume/capacity (ml, l) temperature (°C) time (seconds, minutes, hours) 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 use their results to draw conclusions based on evidence proving a scientific point use a wider range of secondary sources (<i>photos, books and videos</i>) to find and support answers identify scientific evidence that has been used to support or refute ideas or arguments use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and findings
<p>Conclusion</p>				

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<p>Evaluation</p>	<ul style="list-style-type: none"> ✿ adjust their behaviour to different situations (<i>feelings and scientific discussions and discoveries</i>) 	<ul style="list-style-type: none"> ✿ use simple evaluation techniques including saying whether they were surprised with results or not and what they would change next time about their investigation 	<ul style="list-style-type: none"> ✿ find and suggest improvements for the investigations they have already completed and, with support, they will identify new questions arising from their data and make predictions for new values within or beyond data they have collected 	<ul style="list-style-type: none"> ✿ recognise and make improvements for the investigations they have already completed and use test results to identify when further tests and observations might be needed, along with making predictions to set up further comparative and fair tests
<p>Understanding</p>	<ul style="list-style-type: none"> ✿ explain why some things occur and talk about changes 	<ul style="list-style-type: none"> ✿ be able to talk about how scientific ideas and discoveries help us in our daily lives e.g. <ul style="list-style-type: none"> - discovering what plants need linked to us having food to eat - material properties to build homes - basic needs for humans to live longer and more healthily ✿ begin to understand that science can sometimes be dangerous 	<ul style="list-style-type: none"> ✿ know which things in science have made our lives better e.g. <ul style="list-style-type: none"> - importance of light and eye safety - electrical appliances in our daily lives - medical advancements in health and hospitals ✿ understand there is some risk in science 	<ul style="list-style-type: none"> ✿ see how science is useful in everyday life and which parts of our life rely on it ✿ talk about how scientific ideas have changed over time e.g. <ul style="list-style-type: none"> - belief the Earth was the centre of the universe - evolution - belief atom was smallest thing ✿ explain the positive and negative effects of scientific development e.g. <ul style="list-style-type: none"> - nuclear power - oil powered cars - plastic