

Science at Locks Heath Junior School

Progression of Disciplinary strands.

		Year 2 (infant school)	Year 3	Year 4	Year 5	Year 6
Disciplinary Knowledge	Asking Questions 	Can ask simple questions relevant to the topic. Know their questions can be answered in different ways. Can use a range of question stems.	Can raise questions can carry out tests with support to find things out. Can write a range of questions relevant to the topic. Can answer questions posed.	Can ask a range of questions to sort and classify. Can write a range of questions using own scientific knowledge. Can answer questions independently using secondary sources.	Use scientific experiences to explore ideas and raise different higher order questions. Can create further questions to investigate. Can raise questions and suggest reasons for similarities and differences	Can raise questions to further prove or disprove a scientific enquiry. Can raise questions about a range of phenomena.
	Make predictions 	Draws knowledge from observations to make predictions. Can begin to test predictions and later answer questions.	Draws on knowledge to make predictions. Can add detail to their predictions. Make further predictions based on what's observed or tested.	Predictions re detailed and explains their thinking, they link to tests, data and use scientific language. Raise further predictions from results based on patterns.	Use subject knowledge, observations or previous learning to make predictions. Add detail and explanations. Can identify a range of variables which could affect their investigations.	Use test results to make predictions to set up further comparative tests. Uses evidence to support predictions. Develop predictions based on research and scientific knowledge.
	Observation and Measurement 	Observe closely and select the correct equipment. Can identify a range of plants using ID charts. Observe how plants and animals grow and record findings. Notice similarities and differences. Use observations and ideas to suggest answers to questions. Use standard units to estimate and measure. Use rulers, scales, thermometers and measuring vessels with a degree of accuracy.	Make systematic and careful observations. Select own equipment for observing including digital cameras. Look for naturally occurring patterns. Collect data from own observations. Can make observations and decide how to record them to answer a question. Take accurate measurements using standard units. Use a range of equipment and begin to read digital measurements from data loggers and stop watches	Make systematic and careful observations to ask questions and group objects using classification keys. Observe closely and explain processes. Identify similarities, differences or changes related to simple scientific ideas or processes. Take and record accurate measurements using standards units to 2dp. Use data loggers to record. Use volt metres and begin to gather repeat readings to increase accuracy.	Observe carefully and make comparisons. Observe changes over a period of time. Make decisions about what to observe to answer questions. Use observation skills and ID kits to identify plants and animals. Take repeat measurements where appropriate. Can find the average of data. Select measuring equipment and use accurately e.g. ruler, tape measure, trundle wheel, force metres.	Can make accurate drawings of plants and animals based on observations. Take measurements using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where appropriate. When collecting measurements decide whether to increase sample size for validity and reliability. Record measurements to 3dp. Use protractors, rulers, force metres, volt meters accurately
	Planning enquiries 	Can plan and carry out simple tests linked to the different types of enquiry. They can carry out a simple comparative test using some of their own ideas. Can suggest their own resources to carry out tests.	Can set up practical enquiries using comparative and fair tests. Use a range of scientific enquiry. Can investigate and answer on questions linked to shared planning frame. Understand some of the variables needed to be controlled with support. Use a range of equipment e.g. thermometers and data loggers.	Can identify the type of enquiry needed to answer a question. Follow a plan to carry out observations and tests. Use a planning approach with more independence identifying variables and what needs measuring. Children choose their method to carry out their investigation.	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and changes. Understand what type of scientific enquiry is needed to answer and prove/disprove scientific questions or phenomenon.	Children choose the type of enquiry needed to carry out their investigation. Children can pose and answer their own questions, controlling variables where necessary independently. Decide whether sample size needs to be increased for validity. Identify a range of factors which may affect their investigation.

Disciplinary Knowledge

Recording 	<p>Gather and record data to help answer questions. Record observations using photo video, drawings, labelled diagrams or in writing. Count results using tally charts. Use prepared tables to record results more independently. Use simple keys based on yes and no questions. Can sort into 2 groups with own categories and explain reason for choices. Record using prepared bar charts.</p>	<p>Record findings using scientific language, drawings and labelled diagrams including detailed labelling and written explanations based on observations. Can complete a table where they can add own headings and results. Use simple classification keys and Venn diagrams. Can use Carroll diagrams and give reasons for criteria. Can produce bar charts adding own axis labels and headings.</p>	<p>Record findings using systematic and careful observational drawings and labelled diagrams using scientific vocabulary. Children to present the same data in different ways. Can create own tables with headings. Can record using classification keys. Can use Venn and Carroll diagrams with accuracy. Can use discrete and continuous data using line/scatter graphs. Can construct bar chart independently.</p>	<p>Present results in a variety of ways to help answer questions. Can decide how to record from a range of approaches. Can record ideas using accurate diagrams using scientific language. Create own results table including cause and effect. Record results systematically and repeat readings. Use and develop classification keys. Can classify in a number of ways. Use line or scatter graphs to calculate range in a set of data using different scales. Can produce line graphs with various increments.</p>	<p>Record data and results with increasing complexity e.g. accuracy of measurements. Use scientific diagrams, models and labels accurately with clarity and using precise scientific language. Calculate mean and range of a set of data. Can use and produce classification keys independently by posing questions. Can independently collect data and produce scatter and line graphs. Can create bar charts and pie charts to present data.</p>
Interpreting and concluding 	<p>Communicate findings to an audience using relevant scientific language and illustrations. Can identify causal relationships and patterns in results. Can identify which results do not fit the overall pattern and explain findings. Refers to the table of results when describing what has happened. Draws a basic conclusion (with support from the teacher) using own scientific knowledge, observations and comparisons. Uses results of investigations to answer enquiry questions.</p>	<p>Draws conclusions based on observations. Can compare something using results and the conclusion is consistent with the data. Able to adjust opinion and predictions based on results. Can give reasons for results including any anomalies. Use simple scientific language to discuss ideas and communicate their findings in ways appropriate for different audiences orally and written</p>	<p>Draws simple conclusions from results to answer questions and support their ideas. Look for causal relationships in data and identify evidence that refutes/supports ideas. Report on findings to an audience orally and in writing using appropriate scientific vocabulary for a range of audiences. Children use evidence to suggest values for different items tested using the same method. Draw conclusions based on straightforward evidence and current subject knowledge to support their findings. Suggest improvements and raise further questions.</p>	<p>Identify patterns and causal relationships that may be found in the natural environment. Children interpret data to generate simple comparative statements based on evidence. Use results to draw conclusions and can identify external factors that cannot be controlled e.g. temperature inside and outside. Use scientific language and illustrations to discuss, communicate and justify scientific ideas. Can use comparative statements to explain results and how things work.</p>	<p>Look for patterns and relationships using a suitable sample. Use oral and written forms such as displays to report conclusions, causal relationships and give an explanation of the degree of trust in their results. Makes suggestions for ideas that can be explored using pattern seeking. Can spot anomalies and identify results that do not fit the overall pattern. Use data to refute or support ideas or arguments. Focuses on scientific reasons for overall pattern rather than a comparison. Uses labelled diagrams to support their explanation. Use ideas from secondary sources to support their ideas, choosing appropriate websites. Create detailed models to explain processes such as circulatory system and lifecycles.</p>

	Evaluating	<p>With support can suggest improvements to their enquiries.</p> <p>Suggest some things that could be changed and evaluate why things went wrong.</p> <p>Use success ladders with multiple criteria to evaluate the test or their understanding against the learning objective.</p>	<p>Suggest improvements and raises further questions</p> <p>Use evidence and subject knowledge to refute statements.</p> <p>Make suggest improvements from enquiries.</p> <p>Make basic statements about what worked well and what they would change.</p> <p>Use success ladders confidently to evaluate their tests or understanding against multiple criteria and suggest simple next steps.</p>	<p>Evaluate and communicate their methods and findings.</p> <p>Suggest ways to improve what they have already done.</p> <p>Begin to evaluate different aspects of their enquiries such as equipment.</p> <p>Begin to understand how the enquiry improves outcomes from their questions.</p> <p>Use different charts to evaluate such as ranking scales, star diagrams and success ladders. Suggest points for development based on the weakest aspects.</p>	<p>Evaluate and decide when further observations, comparative and fair tests might be needed.</p> <p>Evaluate different aspects of their enquiries such as equipment and accuracy of measurements.</p> <p>State how the enquiry improves outcomes from their questions.</p> <p>Can relate their results to the question and state if their test has enabled them to answer it.</p> <p>Use a range of charts to evaluate such as ranking scales, star diagrams including those with negative numbers.</p> <p>Suggest next steps based on the weakest aspects and state how this will help them or the test progress or give different results.</p>	<p>Can describe and evaluate their own and other people's scientific ideas using evidence from a range of sources.</p> <p>Evaluate their choice of method, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources.</p> <p>Use scientific language and evaluate how their enquiry has answered the question.</p>
--	-------------------	---	--	---	---	--