

Science Curriculum Procedural Knowledge Progression Map

(Working Scientifically)

Planning			
Asking questions and Planning to answer a question			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Asking Questions	<p>LI: To learn to ask questions</p> <ol style="list-style-type: none"> 1. I can ask a question using sentence stems (how, what, why etc) 2. I can ask questions using scientific vocabulary 3. I can ask relevant scientific questions 	<p>LI: To learn to ask relevant questions</p> <ol style="list-style-type: none"> 1. To use precise scientific vocabulary to structure questions 2. I can use scientific knowledge to ask probing questions (I can use knowledge to ask further, more probing questions e.g. I know this.... I know this...., but what I want to know if....) 3. To recognise when a question is / is not able to be answered 	<p>LI: To learn to ask relevant questions</p> <ol style="list-style-type: none"> 1. I can generate testable question to: <ol style="list-style-type: none"> a) Observing over time (what type of sugar dissolves the fastest?) b) Identifying, classifying and grouping (How can we classify teeth into groups?) c) Pattern Seeking (Are the oldest children in the school the tallest?) d) Comparative and fair testing (controlled investigations) (Does sea water evaporate quicker than fresh water?) e) Researching using secondary sources (What do different types of microorganisms do?)
Planning to answer a question	<p>LI: To learn to recognise questions can be answered in different ways</p> <ol style="list-style-type: none"> 1. Suggest one way to answer a question 2. Suggest simple steps to answer a question 3. Suggest an order of steps to answer a question 	<p>LI: To learn how to plan a scientific enquiry to answer questions</p> <ol style="list-style-type: none"> 1. Suggest relevant ways to make observations 2. Know when observations would need to be recorded 3. Identify what needs to be measured 4. Know when measurements would need to be made 	<p>LI: To learn to plan a scientific enquiry to answer a question</p> <ol style="list-style-type: none"> 1. Suggest most appropriate enquiry and state what data / information this approach gives 2. Suggest a systematic method identifying variables and control variables 3. Suggest relevant measurements to provide evidence of findings (control and independent variables)

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<u>Using equipment and Making Observations</u>			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Equipment	<p>LI: To learn to use simple equipment</p> <ol style="list-style-type: none"> 1. To follow instructions to use scientific equipment accurately and safely 2. Explain what information scientific equipment tells us (weight, length, temperature etc) 3. Take measurements using simple scientific equipment (e.g. ruler cms, pipette 3 drops) 4. select appropriate scientific equipment (choice of 2-3) for a purpose 	<p>LI: To learn to take accurate measurements using a range of equipment</p> <ol style="list-style-type: none"> 1. Use knowledge of scientific equipment to measure correctly e.g. thermometers and data loggers, with use of correct units 2. To make systematic measurements to begin to improve accuracy 	<p>LI: To learn to take accurate and precise measurements using a range of scientific equipment</p> <ol style="list-style-type: none"> 1. Measure with accuracy 2. Repeat measurements and compare findings 3. Explain the differences between results 4. Understand where and why repeated readings are required (linked to reliability) 5. Question the reliability of results and explain why
Observing	<p>LI: To learn to observe closely</p> <ol style="list-style-type: none"> 1. I can verbally describe what I can see 2. Record what I can see (list of facts – usually nouns or simple drawing to represent facts) 3. I can make descriptive observations (verbs / adjectives, accurate drawing to show size, colour, texture) 4. I can make numerical observations 5. I can make comparative observations 	<p>LI: To learn to make systematic and careful observations</p> <ol style="list-style-type: none"> 1. Generate a criteria to observe 2. To make systematic observations by deciding when and how to record information 3. To make comparative observations 4. To make simple generalisations to support what is observed 	<p>LI: To learn to take accurate and precise observations using a range of scientific equipment</p> <ol style="list-style-type: none"> 1. Measure with accuracy 2. Repeat observations and compare findings 3. Explain the differences between results 4. Understand where and why repeated observations are required (linked to reliability) 5. Question the reliability of observations and explain why

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<u>Method</u>			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Set up tests / Method	<p>LI: To learn to carry out simple tests</p> <ol style="list-style-type: none"> 1. Follow safety instructions throughout a test 2. Follow given instructions in order 3. Explain methods being used orally 	<p>LI: To learn to set up simple comparative and fair tests</p> <ol style="list-style-type: none"> 1. Know if a test is fair or not 2. Explain why the test is fair / unfair 3. Know what a variable and controlled variable is and how this makes a fair / unfair test 4. Select an independent variable and control variable(s) to measure or observe 	<p>LI : Set up further comparative / fair tests using test results</p> <ol style="list-style-type: none"> 1. Set up tests to establish if prediction or trends are accurate 2. Set up tests to address data anomalies <p>(This could be given data or data from student data explored from predicting and evaluating.)</p>

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<u>Classifying Evidence and Recording Evidence</u>			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Classify Evidence	<p>LI: To learn to identify and classify (objects and living things)</p> <ol style="list-style-type: none"> 1. I can identify simple features 2. I can use features to classify / group 3. I can explain the reason behind groupings (including comparatives) <p>labelled diagrams, table or tally chart, pictograms and bar charts</p>	<p>LI: To learn to classify data / information to answer a question</p> <ol style="list-style-type: none"> 1. Classify information(sort) 2. Justify classification using criteria 3. Justify using scientific vocabulary and knowledge 	<p>LI: To learn how to gather and record complex data/information and results in a</p> <ol style="list-style-type: none"> 1. Collect relevant data/information 2. Choose an appropriate method to collect relevant data/information correctly e.g. list, table, chart, diagram 3. Use scientific labels, titles, layout and scales to record data accurately 4. Plot data accurately 5. Identify errors in accuracy and suggest changes in method to rectify errors
Recording Evidence	<p>LI: To learn to record and gather information</p> <ol style="list-style-type: none"> 1. I can collect information on a given template 2. I can record the information correctly on a given template <p>Photos, 2 – 3 column tables , Tally charts, list, grid, labelled diagram pictograms, bar charts Y1 – one picture / block = one; Y2 – one picture / block = 2,5,10</p>	<p>LI: To learn to gather and record data / information to answer a question in a (insert enquiry type)</p> <ol style="list-style-type: none"> 1. Complete provided templates without labels for headings etc (list, table, chart, diagram etc) 2. Systematically record data during the investigation (not at the end) 3. To reflect on information collected and evaluate its suitability <p>Note: Measuring devices needed on most tests</p>	<p>... Complex keys, Scientific diagrams, line graph, scatter graph</p>

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<u>Presenting, Explaining and Concluding</u>			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Presenting Findings	<p>LI: To learn to communicate their findings in a range of ways.</p> <ol style="list-style-type: none"> 1. I can orally explain what I have learned to others. 2. I can record findings in simple sentences or labels. 3. I can explain using simple scientific language 	<p>LI: To learn to report findings from an enquiry</p> <ol style="list-style-type: none"> 1. Choose how to present findings 2. Explain findings using simple scientific language and knowledge 3. Represent the same findings in two different ways and compare which is most effective 	<p>LI: To learn to report findings from an enquiry</p> <ol style="list-style-type: none"> 1. Identify relevant findings from the enquiry 2. Explain my findings from the enquiry using scientific language 3. Choose relevant ways to report and present
Draw Conclusions	<p>LI: To learn to use observations / data to answer questions</p> <ol style="list-style-type: none"> 1. I can talk about what I have found out 2. I can answer a question by using observations or data 3. I can use comparative observations to answer questions 	<p>LI: To learn to use results to draw simple conclusions</p> <ol style="list-style-type: none"> 1. Use scientific evidence to answer a question using comparatives 2. Use scientific evidence to find simple patterns and relationships 3. Use numerical data to support findings. 	<p>LI: To learn to use results to draw conclusions</p> <ol style="list-style-type: none"> 1. Use evidence discovered to answer questions / explain findings 2. Use numerical data to support findings 3. Use numerical data comparatively to support findings 4. To conclude on comparative findings using scientific vocabulary 5. To conclude by summarising causal relationships
Explaining		<p>LI: To learn to identify differences, similarities or changes between simple scientific ideas and processes</p> <ol style="list-style-type: none"> 1. Compare scientific ideas or processes 2. Use scientific vocabulary to explain the differences, similarities or change 	<p>LI: To learn to apply scientific evidence</p> <ol style="list-style-type: none"> 1. Identify scientific evidence from 2 sources 2. Use scientific evidence to support an idea 3. Use scientific evidence to refute an idea. 4. Use evidence in an argument

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<u>Predicting and Evaluating</u>			
	Year 1 / 2	Year 3 / 4	Year 5 / 6
Predict	<p>No requirement to predict or evaluate in KS1</p> <p>Pupils are required to notice patterns and gather precise declarative knowledge to ensure the pupils are in a position to predict in KS2.</p> <p>Predicting is scientific procedural knowledge. Declarative knowledge is needed to make an informed prediction (not an uninformed guess).</p>	<p>LI: To learn to make predictions for new values and ask further questions, using data</p> <ol style="list-style-type: none"> 1. Identify patterns to inform prediction 2. Suggest new values based on known information 3. Suggest further questions to ask based on the findings from an initial investigation 	<p>LI: To learn to use test results to make predictions</p> <ol style="list-style-type: none"> 1. Identify patterns and connections 2. Use patterns and connections to inform prediction 3. Establish further lines of enquiry
Evaluate	<p>Evaluation procedural knowledge is not included in KS1. Pupils will however draw conclusions</p>	<p>LI To learn to suggest improvements to an experiment</p> <ol style="list-style-type: none"> 1. Identify negatives in an investigation (evaluate) 2. Suggest ways to overcome the negatives in an investigation 3. To suggest improvements to address minor anomalies which effect the reliability of results. 	<p>LI: To learn to evaluate results</p> <ol style="list-style-type: none"> 1. I can identify positives and negatives (linked to method, quality of data collection and reliability of results) 2. I can identify ways to overcome these issues in future experiment