

Working Scientifically Progression

Planning

Asking questions and Planning to answer a question

	Year 1 / Year 2	Year 3 / Year 4	Year 5 / Year 6
1. Asking Questions	<p>LO: To be able 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>LO: To be able to ask relevant questions</p> <ol style="list-style-type: none"> 1. I can 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. I can recognise when a question is / is not able to be answered 	<p>LO: To be able 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?)
2. Planning to answer a question	<p>LO: To be able to recognise questions can be answered in different ways</p> <ol style="list-style-type: none"> 1. I can suggest one way to answer a question 2. I can suggest simple steps to answer a question 3. I can suggest an order of steps to answer a question 	<p>LO: To be able to plan a scientific enquiry to answer questions</p> <ol style="list-style-type: none"> 1. I can suggest relevant ways to make observations 2. I can suggest when observations would need to be recorded 3. I can identify what needs to be measured 4. I can suggest when measurements would need to be made 	<p>LO: To be able to plan a scientific enquiry to answer a question</p> <ol style="list-style-type: none"> 1. I can suggest most appropriate enquiry and state what data / information this approach gives 2. I can suggest a systematic method identifying variables and control variables 3. I can suggest relevant measurements to provide evidence of findings (control and independent variables)



Using equipment and Making Observations

	Year 1 / Year 2	Year 3 / Year 4	Year 5 / Year 6
3. Equipment	<p>LO: To be able to use simple equipment</p> <ol style="list-style-type: none">1. I can follow instructions to use scientific equipment accurately and safely2. I can explain what information scientific equipment tells us (weight, length, temperature etc)3. I can measurements using simple scientific equipment (e.g. ruler cms, pipette 3 drops)4. I can select appropriate scientific equipment (choice of 2-3) for a purpose	<p>LO: To be able to take accurate measurements using a range of equipment.</p> <ol style="list-style-type: none">1. I can use knowledge of scientific equipment to measure correctly e.g. thermometers and data loggers, with use of correct units2. I can make systematic measurements to begin to improve accuracy	<p>LO: To be able to take accurate and precise measurements using a range of scientific equipment</p> <ol style="list-style-type: none">1. I can measure with accuracy2. I can repeat measurements and compare findings3. I can explain the differences between results4. I can understand where and why repeated readings are required (linked to reliability)5. I can question the reliability of results and explain why
4. Observing	<p>LO: To be able to observe closely</p> <ol style="list-style-type: none">1. I can verbally describe what I can see2. 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 observations5. I can make comparative observations	<p>LO: To learn to make systematic and careful observations</p> <ol style="list-style-type: none">1. I can generate a criteria to observe2. I can make systematic observations by deciding when and how to record information3. I can make comparative observations4. I can make simple generalisations to support what is observed	<p>LO: To be able to take accurate and precise observations using a range of scientific equipment</p> <ol style="list-style-type: none">1. I can measure with accuracy2. I can repeat observations and compare findings3. I can explain the differences between results4. I can understand where and why repeated observations are required (linked to reliability)5. I can question the reliability of observations and explain why

Method

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



Classifying Evidence and Recording Evidence

	Year 1 / Year 2	Year 3 / Year 4	Year 5 / Year 6
6. Classify Evidence	<p>LO: To be able 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>LO: To be able to classify data / information to answer a question</p> <ol style="list-style-type: none"> 1. I can classify information(sort) 2. I can justify classification using criteria 3. I can justify using scientific vocabulary and knowledge 	<p>LO: To be able to gather and record complex data/information and results in a</p> <ol style="list-style-type: none"> 1. I can collect relevant data/information 2. I can choose an appropriate method to collect relevant data/information correctly e.g. list, table, chart, diagram 3. I can use scientific labels, titles, layout and scales to record data accurately 4. I can plot data accurately 5. I can identify errors in accuracy and suggest changes in method to rectify errors <p>Complex keys, Scientific diagrams, line graph, scatter graph</p>
7. Recording Evidence	<p>LO: To be able to record and gather information</p> <ol style="list-style-type: none"> 1. I can collect information for 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>LO: To be able to gather and record data / information to answer a question in a (insert enquiry type)</p> <ol style="list-style-type: none"> 1. I can complete provided templates without labels for headings etc (list, table, chart, diagram etc) 2. I can systematically record data during the investigation (not at the end) 3. I can reflect on information collected and evaluate its suitability <p>Note: Measuring devices needed on most tests</p>	

Presenting, Explaining and Concluding

	Year 1 / Year 2	Year 3 / Year 4	Year 5 / Year 6
8. Presenting Findings	<p>LO: To be able 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>LO: To be able to report findings from an enquiry</p> <ol style="list-style-type: none"> 1. I can 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>LO: To be able to report findings from an enquiry</p> <ol style="list-style-type: none"> 1. I can identify relevant findings from the enquiry 2. I can explain my findings from the enquiry using scientific language 3. I can choose relevant ways to report and present
9. Draw Conclusions	<p>LO: To be able 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>LO: To be able to use results to draw simple conclusions</p> <ol style="list-style-type: none"> 1. I can use scientific evidence to answer a question using comparatives 2. I can use scientific evidence to find simple patterns and relationships 3. I can use numerical data to support findings. 	<p>LO: To learn to use results to draw conclusions</p> <ol style="list-style-type: none"> 1. I can use evidence discovered to answer questions / explain findings 2. I can use numerical data to support findings 3. I can use numerical data comparatively to support findings 4. I can conclude on comparative findings using scientific vocabulary 5. I can conclude by summarising causal relationships
10. Explaining		<p>LO: To be able to identify differences, similarities or changes between simple scientific ideas and processes</p> <ol style="list-style-type: none"> 1. I can compare scientific ideas or processes 2. I can use scientific vocabulary to explain the differences, similarities or change 	<p>LO: To learn to apply scientific evidence</p> <ol style="list-style-type: none"> 1. I can identify scientific evidence from 2 sources 2. I can use scientific evidence to support an idea 3. I can use scientific evidence to refute an idea. 4. I can use evidence in an argument

Predicting and Evaluating

	Year 1 / Year 2	Year 3 / Year 4	Year 5 / Year 6
11. 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>LO: To be able to make predictions for new values and ask further questions, using data</p> <ol style="list-style-type: none"> 1. I can Identify patterns to inform prediction 2. I can suggest new values based on known information 3. Suggest further questions to ask based on the findings from an initial investigation 	<p>LO: To be able to use test results to make predictions</p> <ol style="list-style-type: none"> 1. I can identify patterns and connections 2. I can use patterns and connections to inform prediction 3. I can establish further lines of enquiry
12. Evaluate	<p>Evaluation procedural knowledge is not included in KS1. Pupils will however draw conclusions</p>	<p>LO: To be able to suggest improvements to an experiment</p> <ol style="list-style-type: none"> 1. I can identify negatives in an investigation (evaluate) 2. I can suggest ways to overcome the negatives in an investigation 3. I can suggest improvements to address minor anomalies which effect the reliability of results. 	<p>LO: To be able 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



Vocabulary

	Year 1 / Year 2		Year 3 / Year 4		Year 5 / Year 6
Resources	egg timers stop watch ruler tape measure beaker pipette syringe hand lenses		Thermometers data loggers microscope		
Scientific Language	sort group test explore observe e compare e describe e Gather Measure e Record results	similarities/differences order patterns link secondary sources Questions Answers Equipment	scientific enquiry changes increase decrease identify Classify comparative tests fair tests method variable	accurate appearance e evidence present data evidence results unit results conclusion s prediction	opinion/fact variables independent variable dependent variable controlled variable precision reliable degree of trust evidence causal relationships support/refute
Presenting	pictogram tally chart block diagram table bar chart		Keys		classification keys scatter graphs line graphs