**Working Scientifically – KS1 Progression**

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| **Statutory guidance** | **Y1 expectations** | **Y2 expectations** |
| asking simple questions and recognising that they can be answered in different ways | * Ask questions about new topic – teacher scribes and then mind map goes on the working wall. * Focus on one question the whole class answers.   Examples:   * Is…..waterproof? * Is a tiger a carnivore? | * Variety of questions are posed on post-it notes by the children based around the new topic and what they would like to learn. Some starter vocabulary cards might be given. * Different variables are investigated planning starts as a whole class and works towards planning in groups then with learning partners.   Examples:  Explain how you know…..is waterproof?  How do you know a tiger is a carnivore? |
| observing closely, using simple equipment | Teachers gives/guides choices of equipment   * Detail of observation – guided * Eyes * Hand lenses * Observational drawings * Cameras/iPads | * Child led choice of equipment * Detail of observation – child led * Eyes * Hand lenses * Observational drawings * microscopes   Comparing different methods |
| performing simple tests | * look at a question given by class teacher and investigate with teacher scaffolding. * All equipment is provided. | * Teacher gives an area of learning with children generating a testable question. * Teacher provides a recording scaffold * Teacher provides a range of materials that children can choose from with some irrelevant items included. |
| identifying and classifying | * Sorting objects and pictures into groups * As a class introducing sorting and recording into tables and pictograms. | * Sorting pictures and writing into groups as a table or individually. * Children are using scientific vocabulary * Children choose categories to sort groups * Children use caroll and venn diagrams for sorting |
| using their observations and ideas to suggest answers to questions | * Orally making predictions and questioning statements during sessions | * Write down answers to predictions and reasoning why. * Draw on observations to refer back to ideas |
| gathering and recording data to help in answering questions. | * Children choose how to record their findings * Introduction to sorting using hoops on the carpet * Basic pictograms collated as a whole class (1 picture represents 1) | * Tables * Pictograms (1 picture can represent 1/2/3/5/10) * Interpreting data into block graphs from tables or tally’s |

**Working Scientifically – Lower KS2 Progression**

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|  | Year 3 | Year 4 |
| Asking relevant questions and using different types of scientific enquiries to answer them | Ask scientific questions, answer with support. Teacher led/demonstrated  For example: what do we know? What would we like to find out? What links can we make? | Investigate to reach the answer more independently. Choose which type of enquiry (limited range)  Key question stems to inspire children. |
| Setting up simple practical enquiries comparative and fair tests | Introduce the vocab and content of fair test. Set up enquiries with scaffold with class discussion and adult support. | Decide when to use a fair test and understand the reason why. |
| Making systematic and careful observations and where appropriate taking accurate measurement using standard units, range of equipment including thermometers and data loggers | Pictorial observations (labelled) or verbal responses recorded by teacher. Given the correct equipment and modelled | Pictorial and written observations  Choose the appropriate equipment |
| Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. | Bar charts/Venn diagram  ~Keys for classifying and grouping (Geog link mapping)  A choice of how to present their data (guided and modelled by the teacher) | Decide how to collect data  Choose how to present – child led.  Ask further questions based on data.  Key questions to support the children |
| Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. | Labelled diagrams and drawings  Bar charts, pictograms (any number representations) and tables | Labelled diagrams and drawings  Bar charts and tables. Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. |
| Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions | Introduce secondary source and compare introduce a range of presentation skills (bar, tally)  Guidance on methods but a lot more verbal explanations and conclusions  Developing scientific language | Make decisions of how to record.  Drawing conclusions and beginning to make links.  Repeat readings for accuracy. |
| Using results to draw simple conclusions, make predictions | Record and explain results  Use results to make basic conclusions  Use conclusions to ask more questions | Suggest new questions to research  Predicting results for alternative investigations  Improving investigations through reflections  Developing cause and effect statements and ‘er’ and ‘er’ statements (greater the battery the brighter the bulb) |
| Identifying differences similarities or changes related to simple scientific ideas and processes | Cover vocab (differences, sim changes)  Identifying ways in which ideas/topics are different or similar and why  Could we change process to improve? | Raise questions as to why we have similarities/differences  Why and how we could change processes  Draw on secondary sources to support discussions |
| Using straight forward scientific evidence to answer questions or to support their findings | Use a range of sources to answer questions  Communicate findings using evidence | And clarify or justify reasons or results  Using an appropriate method and language |

**Working Scientifically – Progression Upper KS2**

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| **Statutory guidance** | **Y5 expectations** | **Y6 expectations** |
| **planning different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary** | * Plan investigations – introduce types of variables * Vocab as a class is discussed and variables decided. * One investigation idea is chosen * Structured with limited variables | * Variables are identified along with type of enquiry. * Each child carries out own investigations as an individual, pair or small group. |
| **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** | * Data loggers * Repeated readings are taken and averages looked at. * Choose equipment within a selection. | * Different situations/contexts given * Children choose equipment * Question posed of ‘what else would you need to do to answer this question? * use and accuracy of reading measurements and outcomes/ conclusion – following the investigation |
| **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** | * Line graphs * Scatter graphs * Bar graphs * Structure given such as axis but the children plot the data | * Design and create own methods of recording data. * Understanding pros and cons and choosing their own method of presenting findings. |
| **using test results to make predictions to set up further comparative and fair tests** | * Link lessons together using knowledge gained from previous sessions. | * Posed questions such as ‘what if……. At the end of an experiment. * Use knowledge to independently make predictions, set up and carry investigation * Articulate their understanding/reasoning. * Applying their understanding and reasoning to other contexts using their routines. |
| **reporting and presenting 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** | * What if questions posed orally. * Less formal such as newspaper reports or comic strips. * Teach causal relationships. | * Written forms * Formal * Use causal relationships * What if questions * Look into…… |
| **identifying scientific evidence that has been used to support or refute ideas or arguments.** | * Make a hypothesis and reflect on this at the end of the session. * Testing well known scienctific facts/challenge them. * Research – discuss – justify/ compare/analyse | * Researching and justifying with arrange of sources, open up investigations to prove or disprove theories. Find the sciencfic knowledge to support their testing. * Who discovered it?...... |