Progression of Working Scientifically Key Skills in Science

	EYFS	KS1		Lower KS2		Upper KS2		KS3
Key Skills	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Asking Questions	I question why things happen I have my own ideas	Explore the world around them and raise their own simple questions Experience different types of science enquiries, including practical activities Begin to recognise different ways in which they might answer scientific questions		Raise their own relevant questions about the world around them Should be given a range of scientific experiences including different types of science enquiries to answer questions AND Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions		Use their science experiences to explore ideas and raise different kinds of questions Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions Talk about how scientific ideas have developed over time		Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Understand that scientific methods and theories develop over time as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review
Practical Enquiry	I test my ideas	**Observation over time:** Observe changes over time **Comparative and fair testing:** Carry out simple tests. Use simple features to compare objects, materials and living things and carry out simple tests **Identifying and classifying** with help, decide how to sort and group objects, materials and living things **Pattern seeking** **Researching using secondary sources:** Ask people questions and use simple secondary sources to find answers		**Observation over time:** Observe changes over time **Comparative and fair testing:** Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and help to decide how to set it up **Identifying and classifying** Talk about criteria for grouping, sorting and classifying; and use simple keys **Pattern seeking** **Researching using secondary sources:** Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations		**Observation over time:** Observe changes over time 2**Comparative and fair testing:** Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why **Identifying and classifying** Use and develop keys and other information records to identify, classify and describe living things and materials, **Pattern seeking** Identify patterns that might be found in the natural environment or in data (use words like increases/decreases or stays the same) **Researching using secondary sources:** Recognise which secondary sources will be most useful to re- search their ideas and begin to separate opinion from fact Begin to suggest where to look for sources with help		**Observation over time:** Observe changes over time **Comparative and fair testing:** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Make predictions using scientific knowledge and understanding Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility **Identifying and classifying** Apply sampling techniques. Use appropriate techniques, apparatus, and materials during fieldwork, paying attention to health and safety **Pattern seeking** Identify patterns in data, including identification of outliers and how to mitigate for these when calculating mean values **Researching using secondary sources:** Separate opinion/bias from scientific fact. Evaluate which sources are the most suitable by paying attention to objectivity and concern for accuracy, precision, repeatability and reproducibility Be able to find own secondary sources
Observations **Equipment**	I notice similarities and differences I can use my senses and look closely	Observe closely with help.		Given help to make decisions about what observations to make, how long to make them for. Make systematic and careful observations		Make their own decisions about what observations to make, what measurements to use and how long to make them for		Make and record observations and measurements using a range of methods for different investigations (from the 5 methods of enquiry)

Measurements		Use simple measurements and equipment (e.g., hand lenses, egg timers) to gather data Take simple measurements with help	Given help to make decisions about the type of simple equipment that might be used. Learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately Take accurate measurements using standard units	Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.	Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature
Recording and Presenting Evidence	I use equipment and tools carefully	Record simple data With help, they should record their findings in a range of ways and begin to use simple scientific language	Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data	Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Present observations and data using appropriate methods, including tables and graphs Apply mathematical concepts and calculate results Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques
Answering Questions and Concluding	I can create simple representations of people and objects	With guidance, they should begin to notice patterns and relationships Use their observations and ideas to suggest answers to questions Talk about what they have found out and how they found it out	Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions	Look for different causal relationships in their data and identify evidence that refutes or supports their ideas Identify scientific evidence that has been used to support or refute ideas or arguments	Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
Communicating Findings Scientifically	I can talk about things like plants, animals, natural and found objects	With help, they should communicate their findings in a range of ways and begin to use simple scientific language	Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, Use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results	Present reasoned explanations using scientific vocabulary, including explaining data in relation to predictions and hypotheses Evaluate data, showing awareness of potential sources of random and systematic error
Evaluating and Raising Further Questions and Predictions	I begin to use science words		With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done	Use their results to make predictions and identify when further observations, comparative and fair tests might be needed	Evaluate the reliability of methods and suggest possible improvements Evaluate risks Identify further questions arising from their results

See pupil version below

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Key Skills	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Asking Questions	I question why things happen I have my own ideas	I ask simple questions I recognise that questions can be answered in different ways		I ask my own questions I use different ways to answer them		I ask different kinds of questions		I ask my own questions based on what I already know and have experienced
Practical Enquiry	I test my ideas	I perform simple tests		I set up my own simple tests		I plan different types of scientific enquiries to answer questions I can set up fair tests when necessary		I am beginning to choose which type of scientific enquiry to use I can make predictions using what I already know I am beginning to understand the difference between independent, dependent and control variables in investigations I consider health and safety and can identify hazards and suggest how to reduce risk I can evaluate my method and suggest improvements
Observations	I notice similarities and differences I can use my senses and look closely	I can compare things. I sort and group them. I observe closely		I make careful observations		I decide what observations to make		I know that my observations need to be as accurate as possible and are based on what I can see, not on what I think will happen I am beginning to learn the difference between qualitative and quantitative observations
Equipment and measurements	I use equipment and tools carefully	I use simple equipment to make measurements		I use different equipment to measure accurately in standard units		I decide what measurements to make I use different scientific equipment to measure with precision I take repeat readings when appropriate		I am beginning to choose what equipment to use and what measurements to make. I pay attention to units
Recording data	I can create simple representations of people and objects	I gather simple data in different ways		I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables		I decide how to record data and result. I can use scientific diagrams, labels, classification, keys, tables, scatter, bar and line graphs		I know how to use different methods of recording data e.g., how to draw tables and graphs correctly and where/how the independent and dependent variables should be recorded I am beginning to consider accuracy, precision, repeatability and reproducibility of my data I know what an outlier is
Answering Questions / Communicating Conclusions/ Raising Further Questions	I can talk about things like plants, animals, natural and found objects	I talk about what I have found out		I explain what I have found out using speaking and writing		I report and present findings using speaking and writing including displays and presentations I use results to make predictions and set up more tests		I use my data to draw conclusions e.g. by describing trends or patterns in graphs I refer to the variables in my conclusions e.g. As the IV increases the DV … I describe what has happened first, then try and explain why it has happened I give reasons for my conclusions based on my findings e.g., this is because… I refer back to my original prediction and ask was it correct? I can present my findings in a large variety of ways My results lead to further questions and I use results to make predictions and set up more tests
Scientific language	I begin to use science words	I use simple scientific language		I use relevant scientific language		I use relevant scientific language and illustrations		I am beginning to use relevant and scientific language with more skill when referring to data and when describing and explain concepts