Shortlanesend

Working Scientifically Progression Overview – Science

Working Scientifically Skills:	Asking Questions	Planning and setting up different types of enquiries	Performing tests (Enquiries)	Using equipment	Observing and measuring	Identifying and classifying (Enquiries)	Gathering and recording data	Reporting, presenting and communicating data/findings
EYFS	**Playing & Exploring:** Show curiosity about objects, events and people Questions why things happen	**Playing & Exploring:** Take a risk, engage in new experiences and learn by trial and error. **The World** Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world **Creating & Thinking Critically**: Make links and notice patterns in their experience	Playing & Exploring: Engaging in open-ended activity. Creating & Thinking Critically: Find ways to solve problems / find new ways to do things / test their ideas	**ELG-Self Confidence & Self Awareness:** Choose the resources they need for their chosen activities. **ELG-Moving & Handling:** Handle equipment and tools effectively.	**The World** losely observes what animals, people and vehicles do. **Playing & Exploring:** Use senses to explore the world around them	**Creating & Thinking Critically:** Develop ideas of grouping, sequences, cause and effect. **ELG-The World:** Know about similarities and differences in relation to places, objects, materials and living things	**Being Imaginative-** Create simple representations of events, people and objects. **ELG-Speaking:** Develop their own narratives and explanations by connecting ideas or events. **Understanding** Builds up vocabulary that reflects the breadth of their experience.	**ELG-Understanding**: Answer how and why questions about their experiences. **ELG-The World:** Make observations of animals and plants and explain why some things occur, and talk about changes
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KS1	Explore the world around them and raise their own simple questions.	Begin to recognise different ways in which they might answer scientific questions. Ask people questions and use simple secondary sources to find answers With guidance, they should begin to notice patterns and relationships.	Experience different types of science enquiries, including practical activities. Carry out simple tests.	Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data.	Observe closely using simple equipment. With help, observe changes over time.	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying).	Record simple data. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.	Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out.
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LKS2	Raise their own relevant questions about the world around them.	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.	Should be given a range of scientific experiences including different types of science enquiries to answer questions. 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.	Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data logger and thermometers appropriately.	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	Talk about criteria for grouping, sorting and classifying; and use simple keys.	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. 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.	With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. 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.
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UKS2	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 and answer scientific questions. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	Talk about how scientific ideas have developed over time. Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.	Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.	Make their own decisions about what observations to make, what measurements to use and how long to make them for.	Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.	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. 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.	Identify scientific evidence that has been used to support or refute ideas or arguments. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed.
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KS3	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. Make predictions using scientific knowledge and understanding. Interpret observations and data, Identify patterns and using observations, measurements. and data to draw conclusions	Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.	Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. Evaluate the reliability of methods and suggest possible improvements. Evaluate risks. Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility. Apply sampling techniques.	Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature.		Make and record observations and measurements using a range of methods for different Investigations. 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. Present reasoned explanations, including explaining data in relation to predictions and hypotheses. Evaluate data, showing awareness of potential sources of random and systematic error. Identify further questions arising from their results.