Science Progression
To work scientifically

Essential characteristics of scientists	•The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings. •Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations. •Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings. •High levels of originality, imagination or innovation in the application of skills. •The ability to undertake practical work in a variety of contexts, including fieldwork. •A passion for science and its application in past, present and future technologies.	
	Key Skills	**Key Vocabulary**
EYFS	• Choose the resources they need for their chosen activities and say when they do or don't need help • Know about similarities and differences in relation to places, objects, materials and living things • Make observations of animals and plants • Explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Select and use technology for particular purposes • Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories • Talk about the features of their own immediate environment and how environments might vary from one another • Explain why some things occur and talk about changes	
Y1/2	• Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• question • answer • observe • observing • equipment • identify • classify • sort • group • record - diagram, chart, map • data • compare, contrast • describe
Y3/4	• Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions.	• **research** - relevant questions, scientific enquiry • comparative and fair test • systematic, careful observations • accurate measurements • oral and written explanations • • conclusion • predictions • differences, similarities,

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	• Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings.	• **equipment** - data logger, thermometer • **data** - gather, record, classify, present • **record** - drawings, labelled diagrams, keys, bar charts, tables	changes • evidence • improve • secondary sources • guides • keys • construct • interpret
Y5/6	• Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.	• plan • variables • measure • accuracy • precision • repeat readings • **record data** - scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph, line graph • predications • further comparative and fair tests	• **report and present** - conclusions, explanations, degree of trust, oral and written display and presentation • evidence - support, refute ideas or arguments • identify, classify and describe • patterns • systematic • quantitative measurements
KS3	***Scientific attitudes*** • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • 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 • evaluate risks		

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	Experimental skills and investigations • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • make predictions using scientific knowledge and understanding • select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables • use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques ***Analysis and evaluation*** • apply mathematical concepts and calculate results • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • 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 ***Measurement*** • understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature • use and derive simple equations and carry out appropriate calculations • undertake basic data analysis including simple statistical techniques