Science Working Scientifically Skills Progression

Science Intent Statement: At Milton Ernest C of E Primary School, we recognise the importance of science in our everyday lives. We believe that science teaching is essential for the development of children's curiosity and understanding of the world around them, respect for the living and non-living and how science is used in the real world. Where possible, we aim to provide a practical curriculum that supports the development and progression of scientific skills and enquiry, subject knowledge and vocabulary through the specific disciplines of biology, chemistry and physics. We intend to provide all children, regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced curriculum and aim to instil a lifelong love of science learning.

There are **five** areas of scientific enquiry:

- Pattern seeking
- Observation over time
- Comparative and fair testing
- Identifying, classifying and grouping
- Researching secondary sources

EYFS – Science enquiry from the Development Matters document:

EYFS	Characteristics of effective learning
Enquiry Skills	Show curiosity about objects, events and people Questions why things happen Answer simple questions through their observations Engage in open-ended activity Take a risk, engage in new experiences and learn by trial and error Say what might happen Find ways to solve problems / find new ways to do things / test their ideas Develop ideas of grouping, sequences, cause and effect Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world Use senses to explore the world around them Make links and notice patterns in their experiences Create simple representations of events, people and objects Build up vocabulary that reflects the breadth of their experience

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	KS1 Statutory requirements from NC	Lower KS2 Statutory requirements from NC	Upper KS2 Statutory requirements from NC
	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions.	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments.

Science Working Scientifically Skills Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking and answering questions	Use everyday language/begin to use simple scientific words to ask or answer a scientific question.	Suggest ideas, ask simple questions and know that they can be answered/investigated in different ways including simple secondary sources, such as books and video clips. Suggest ways of testing a question using equipment given to me	Use ideas to pose questions, independently, about the world around them. Begin to suggest ways to test a question	Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources such as ICT. Answer questions using straight forward scientific evidence. Put forward own ideas for how to answer a question	Raise different types of scientific questions, and hypotheses.	Pose/select the most appropriate line of enquiry to investigate scientific questions.
Making predictions	Begin to say what might happen in an investigation.	Begin to make predictions.	Make predictions and begin to give a reason.	Make predictions and give a reason using simple scientific vocabulary.	Make predictions and give a reason using scientific vocabulary.	Make predictions and give a reason using scientific vocabulary. Base predictions on findings from previous investigations.
Making observations	Observe objects, materials and living things and describe what they see.	Observe something closely and describe changes over time.	Make decisions about what to observe during an investigation.	Describe and make systematic and careful observations using scientific vocabulary.	Plan and carry out comparative and fair tests, making systematic and careful observations.	Make their own decisions about which observations to make, using test results and observations to make predictions or set up further comparative or fair tests.
Equipment and measurements	Use simple, nonstandard equipment and measurements in a practical task.	Use simple equipment to take measurements, make observations and carry out simple tests.	Take accurate measurements using standard units. Begin to select from a range of equipment	Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers. Select the equipment needed to carry out the investigation	Take measurements using a range of scientific equipment with increasing accuracy and precision.	Choose the most appropriate equipment in order to take measurements, explaining how to use it accurately. Check results with additional readings.

Science Working Scientifically Skills Progression

Identifying and classifying	Sort and group objects, materials and living things, with help, according to simple observational features.	Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.	Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.	Identify similarities/differences/changes when talking about scientific processes. Use and begin to create simple keys.	Use and develop keys to identify, classify and describe living things and materials.	Identify and explain patterns seen in the natural environment.
Engaging in practical enquiry (investigating)	Follow instructions to complete a simple test individually or in a group.	Do things in the correct order when performing a simple test and begin to recognise when something is unfair.	Discuss enquiry methods and describe a fair test.	Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables.	Plan a range of science enquiries, including comparative and fair tests.	Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests.
Recording and reporting findings	Begin to record simple data. Talk about their findings and explain what they have found out.	Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary.	Record their findings using scientific language and present in note form, writing frames, diagrams, tables and charts.	Choose appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations).	Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar, scatter and line graphs and models.	Choose the most effective approach to record and report results, linking to mathematical knowledge.
Drawing conclusions	Explain, with help, what they think they have found out.	Use simple scientific language to explain what they have found out.	Draw, with help, a simple conclusion based on evidence from an enquiry or observation.	Use recorded data to make predictions, pose new questions, predict further values and suggest improvements for further enquiries.	Use a simple mode of communication to justify their conclusions on a hypothesis. Begin to recognise how scientific ideas change over time.	Write conclusions using scientific vocabulary and scientific evidence. Discuss how scientific ideas develop over time.
Analysing data **Evaluating and raising further questions and predictions**	Use every day or simple scientific language to ask and/or answer a question on given data.	Identify simple patterns and/or relationships using simple comparative language.	Gather, record and use data in a variety of ways to answer a simple question. Begin to suggest how a test could be improved	Identify, with help, changes, patterns, similarities and differences in data to help form conclusions. Use scientific evidence to support their findings.	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.

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Working Scientifically – Key Vocabulary		
Key Stage 1	**Lower Key Stage 2**	**Upper Key Stage 2**
	All KS1 plus:	All previous Vocabulary plus:
observe changes patterns grouping sorting classifying compare identify (name) results measure record equipment questions test investigate explore predict same different	enquiry practical enquiry fair test comparative test relationships conclusion accurate thermometer data logger estimate data diagram key (identifying) table chart bar chart results prediction method reason similarity difference question properties characteristics	Variables Controlled variable evidence justify accuracy precision scatter graphs bar graphs line graphs argument (science) causal relationship