

working scientifically skills progression

Intent

Why do we teach this? Why do we teach it in the way we do?

At Milwards Primary school and Nursery, we aim to prepare our children for their future with a “hands –on”, inquiry-based science curriculum that enables them to confidently explore and discover the world around them. We will motivate and actively engage our children, to nurture and grow their curiosity. Core scientific knowledge and skills is taught through direct teaching, experimentation and exploration. Our intent is for all our children to be life- long learners who are: inquisitive, independent thinkers, confident to ask ‘Big Questions’ and who are well prepared for their future in the ever-changing world.

Implementation

What do we teach? What does this look like?

We teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. We use a range of resources to plan from including ASE planning. Specific Science units are taught in each year group, building on from previously taught units and skill coverage. Teachers are free to change the order areas are taught to make cross curricular links as long as all areas are covered over the year. The school has designed and implemented a contentious prevision map so previous skills and content is revisited, helping to support children with long term memory.

Impact

The successful approach at Milwards Primary School and Nursery results in a fun, engaging, high-quality science education, that provides children with the foundations for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. So much of science lends itself to outdoor learning and so we provide children with opportunities to experience this. Through various workshops, trips and interactions with experts and local organisations, children have the understanding that science has changed our lives and that it is vital to the world’s future prosperity. Children learn the possibilities for careers in science as a result of our community links and connection with national agencies such as the STEM association. Pupil voice is used to further develop the Science curriculum, through questioning of pupil’s views and attitudes to Science to support the children’s enjoyment of science and to motivate learners.

	Strand	EFYS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ideas about science.		Can take part in exploration activities.	Can begin to talk about how science helps us in our daily lives e.g. our nose helps us to smell, we use a torch to see in the dark.	Can talk about how science helps us in our daily lives e.g. our nose helps us to smell, we use a torch to see in the dark,	Begin to understand that science is not about being right or wrong but is the search for new knowledge. Begins to know which things in science that have made our lives better e.g. computers, medicine and other inventions.	Understands that science is not about being right or wrong but is the search for new knowledge. Knows a variety of things in science that have made our lives better e.g. technologies, sports and leisure and other inventions.	Begins to identify the different parts of scientific enquiry. Begins to talk about how scientific ideas have changed over time. Begins to talk about the positive and negative effects of scientific development. Begins to see how science is useful globally. Begins to say which parts of our lives rely on science.	Begins to identify the different parts of scientific enquiry. Can talk about how scientific ideas have changed over time. Can talk about the positive and negative effects of scientific development. Can see how science is useful globally Can say which parts of our lives rely on science.
Plan	Questioning	Asks how and why questions about his or her experiences of the world.	Ask a few simple scientific questions about the world around them.	Ask and answer scientific questions about the world around them.	Ask questions about the world around them and begin to explain that they can be answered in different ways.	Ask relevant scientific questions about the world around them and identify the ways in which they can be answered.	Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.	Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge.
	Planning	Follows instructions involving several ideas or actions.	With support, follow instructions to perform simple tests	Follow a set of instructions to perform a range of simple tests and begin to talk about what they might do...	Follow a set of instructions when carrying out a test or plan within an adult led group.	Begin to independently plan, set up and carry out a range of comparative and fair tests using given equipment.	Plan and carry out a range of enquiries, identifying variables which could be changed.	Plan and carry out further enquiries in response to results, suggesting equipment they could use.
	Predicting	With support, make a simple prediction about what might happen.	Make a simple prediction about what might happen.	Make a simple prediction giving basic reasoning.	Make plausible predictions based on prior experiences and some scientific knowledge.	Make plausible predictions based on prior experiences and further scientific knowledge.	Make plausible predictions based on a variable, giving reason.	Make plausible predictions based on different variables, giving reason.
Do	Observing & pattern seeking	Makes observations of animals and plants and explains why some things happen. Look at patterns and changes. Look closely at similarities and differences.	Observe objects, materials, living things and changes over time	Observe more closely objects, materials, living things and changes over time	Make increasingly careful observations, identifying similarities, differences and changes, and making simple connections.	With support, choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.	Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect.	Independently, decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect

	Measuring	Can measure short periods of time in simple ways. Order and sequence familiar events. Use everyday language to talk about size, weight, capacity, distance and time.	With support, use simple equipment to measure and make observations.	Use simple equipment to measure and make observations	Take measurements in standard units, using a range of simple equipment.	Take accurate measurements in standard units, using a range of equipment.	Take increasingly accurate and precise measurements, in standard units, using a range of chosen equipment.	Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment.
	Safety in science	Can practise some safety measure without direct supervision.	Begins to understand that science can be dangerous.	Understands science can be dangerous.	Begins to identify risks to themselves in science when working scientifically.	Identify risks to themselves in science when working scientifically.	Begins to identify risks to themselves and others in science when working scientifically.	Identifies risk to themselves and others in science when working scientifically.
	Identifying and classifying.	Know about similarities and differences in relation to places, objects, materials and living things.	Begin to identify and classify. Begin to observe and identify, compare and describe. Begin to use simple features to compare objects, materials and living things and with help decide how to sort them.	Identify and classify. Observe and identify, compare and describe. Use simple features to compare objects, materials and living things and with help decide how to sort them.	Begin to identify difference, similarities or changes related to simple scientific ideas and processes. Begin to compare and group using their own criteria according to behaviour or properties, based on testing. Begin to use simple keys.	Identify difference, similarities or changes related to simple scientific ideas and processes. Talk about criteria for grouping sorting and classifying and use simple keys. Compare and group according to behaviour or properties, based on testing.	Begin to use and develop and develop keys and other information records to identify, classify and describe living things and materials.	Use and develop keys and other information records to identify, classify and describe living things and materials.
	Research	Knows that information can be retrieved from books and computers.	Use books and computers with support to find out scientific information.	Use books and computers with greater independence to find out scientific information.	Begin to recognise when and why secondary sources of information may need to be used to help answer a question.	Recognise when and why secondary sources of information may need to be used to help answer a question.	Begin to recognise which secondary sources will be the most useful to research their ideas.	Recognise which secondary sources will be the most useful to research their ideas.
Record	Gathering and recording data	Record using marks that they can explain.	With support, gather and record simple data in a range of ways (labelled photographs, templates, drawings, sorting diagrams).	Use a range of methods (tables – pre drawn, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy.	Gather and record findings in a variety of ways (diagrams, tables – partially complete, charts and graphs) with increasing accuracy.	Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).	Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, tables, graphs and models).	Choose an appropriate approach to record accurate results, including scientific diagrams, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge.
Review	analysing& concluding	With support, talk about what they have found out. Develops their own narratives by connecting ideas or events.	Talk about what they have done and say, with help, what they think they have found out.	Talk or write about what they have found out, linking this back to their prediction.	Talk or write about what they have found out, using simple evidence to support this. Link what they have found out back to the original prediction.	Talk or write about what they have found out, looking at patterns and trends in their results. Link what they have found out back to the original prediction.	Talk or write about what they have found out. With support look closely at patterns and trends in their results and discuss these. Begin to make possible suggestions for	Talk or write about what they have found out. Look closely at patterns and trends in their results and discuss these. Make possible suggestions for

		Express themselves effectively showing awareness of listener.					anomalies in results. Link what they have found out back to the original prediction.	anomalies and suggest improvements to their investigation. Link what they have found out back to the original prediction.
Vocabulary	Vocabulary & language	Use talk to organise, sequence and clarify thinking, ideas, feelings and events. Extends vocabulary, especially by grouping and naming, exploring the meaning of new sounds and words.	Use some simple scientific language. Begin to use some science words. Use comparative language with support – faster, bigger.	Use simple scientific language and words. Use comparative language.	Begin to use some scientific language to talk about and, later, write about what they have found out. Begin to use relevant scientific language. Use and begin to use comparative and superlative language (longest, furthest)	Use some scientific language to talk about and, later, write about what they have found out. Use relevant scientific language. Use and begin to use comparative and superlative language (longest, furthest)	Beginning to read, spell and pronounce scientific vocabulary correctly, Beginning to use relevant scientific language and illustrations to discuss, communicate and justify science ideas. Beginning to confidently use a range of scientific vocabulary.	Can read, spell and pronounce scientific vocabulary correctly, can use relevant scientific language and illustrations to discuss, communicate and justify science ideas. Can confidently use a range of scientific vocabulary.