Freemantle C of E Community Academy
Progression of Scientific Skills

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking Questions	National Curriculum		Asking simple questions and recognising that they can be answered in different ways		Asking relevant questions and using different types of scientific enquiries to answer them		Planning different types of enquiries to answer questions, including recognising and controlling variables where necessary	
	What does this look like?	• Shows curiosity about objects, events and people. • Questions why things happen. • Asks questions to clarify understanding and aspects of their familiar world e.g. place they live or natural world. • Uses play as an opportunity to ask questions. • Questions what happens if they change something (e.g. I wonder…does the fruit have seeds in?)	• Explore the world around them and raise own questions (e.g. growing, animals in their habitat, everyday materials.). • Can answer questions supported by the teacher, often through scenarios. • Recognise questions can be answered in different ways. • Can begin to ask simple questions and use simple secondary sources to find answers. • Able to ask yes and no questions to sort and classify.	• Raise questions that help them become familiar with scientific processes (e.g. life processes that are common to all living things, their local environment, materials). • Can ask simple questions relevant to the topic that can be answered through investigating. • Can use a range of question stems. (e.g. Is a flame alive? Is a deciduous tree dead in winter? What makes the best habitat for a minibeast? Where in the school can we find something that is made of wood? Which animal belongs to which offspring? Do seeds grow quicker inside or out?) • Know their questions can be answered in different ways through investigating. • Use more than one secondary source to gather and present information clearly.	• Raise own questions about the world around them and why things happen the way they do (e.g. the role of the roots and stem in nutrition and support, or how rocks are formed). • Recognise how and when to use secondary sources to answer questions that cannot be answered in practical science. • Can write a range of questions relevant to the topic. • Can answer questions posed by the teacher, independently or with support. • Identify new questions from presented data. • Can raise questions and carry out tests with support to find things out. • Can carry out research using a small range of secondary sources and present information clearly.	• Can decide how to gather evidence to answer questions. • Raise questions to help identify, group and classify (such as how a habitat changes, animals and living things, including plants). • Can write a range of relevant questions using the world around them and their own scientific knowledge. • Can recognise when secondary sources can be used to answer questions and can select appropriate information from given sources.	• Can study and raise questions to answer (including about their local environment throughout the year). • Can ask relevant questions and suggest reasons for similarities and differences. • Use their scientific experiences to explore ideas and raise different questions. • Can create further questions from enquiries to investigate. • Independently uses secondary sources to find relevant facts about a topic. • Raise further questions from enquiries/research.	• Can raise questions about local animals and how they are adapted to their environment. • Can raise questions about a range of phenomena e.g., rainbows, colours on soap bubbles, objects looking bent in water. • Can ask questions about a range of materials in order to support classification. • Can ask appropriate questions to group and classify. • Can use secondary sources to research (e.g., unfamiliar animals and plants from a broad range of habitats). • Use ideas from secondary sources to support their ideas. • Can raise questions to further prove a scientific enquiry.

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		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making Predictions	National Curriculum		Using their observations and ideas to suggest answers to questions		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions		Using test results to make predictions to set up further comparative and fair tests	
	What does this look like?	• Shows curiosity about objects, events and people. • Questions why things happen. • Can make simple predictions about what they think will happen based on what they can see/their own experiences.	• Can make basic predictions about things they can see or their own ideas. • Can use some taught scientific vocabulary in predictions.	• Can draw on knowledge from observations to make a scientific prediction. • Can begin to test predictions and later answer questions (predictions can be a guess). • Ask questions about what might happen in the future.	• Can use evidence and subject knowledge to agree or refute statements. • Can make logical predictions from questions posed. • Can make further predictions from what is observed or tested.	• Can use subject knowledge or research to make logical predictions. • Raise further predictions from given or found results based on patterns. • Make predictions for new values.	• Use subject knowledge, observations, or previous learning to make logical predictions. • Can add further detail and explanations for their predictions when prompted, explaining why they think this. • Can base predictions on previous scientific enquiry and investigation. • Can identify a range of variables which could affect their investigation and make predictions based on this.	• Develops predictions not only based on results of a scientific enquiry but using own ideas and subject knowledge. • Can use scientific evidence to support predictions. • Can gather evidence through practical science to support predictions. • Can use test results to make predictions to set up further comparative and fair tests (predicting at the end of a test).

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		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Planning Enquires	**National Curriculum**		Asking simple questions and recognising that they can be answered in different ways. Performing simple tests.		Setting up simple practical enquiries, comparative and fair tests.		Planning different types of enquiries to answer questions, including recognising and controlling variables where necessary	
	What does this look like?	• Find ways to solve problems/find new ways to do things. • Can try to test out some ideas. • Take risks or try ideas through trial and error. • Engage in open-ended activities independently. • Choose the resources they need for their chosen activity from their environment.	• Begin to recognise different ways they may answer scientific questions. • Can discuss collaboratively in a group the best method to perform a test. • Experience different types of enquiry including practical activities. • Use practical resources provided by the teacher and can suggest some resources of their own. • Can carry out simple tests to classify, compare or pattern seek.	• Carry out simple comparative tests using own ideas. • Experience different types of enquiry including practical activities. • Can suggest resources they may need for the test from provided options. • Can carry out simple tests linked to the types of enquiry: observation, fair testing, pattern seeking, identifying and classifying and research.	• Can perform a range of scientific investigations including different types of scientific enquiry. • Set up practical enquiries: comparative, and fair tests (post-it-note approach scaffolded by the teacher). • Children investigate and answer own questions linked to shared post-it-note planning frame. • Understand there are different variables to be controlled (can identify some variables e.g. what was changed and what was kept the same). • Follow basic instructions scaffolded by the teacher to conduct investigation. • Use a range of equipment including thermometers, magnifying glasses, etc. (with support).	• Can identify the type of enquiry needed to answer a question. • Follow a plan to carry out observations and tests. • Can select from a range of resources to gather evidence and answer questions, to classify, compare and perform fair tests. • Use post-it-note planning approach with more independence in identifying variables and what needs measuring. • Can choose a method to carry out the investigation.	• Can recognise when and how to set up comparative and fair tests, explaining which variables need to be controlled and changed. • Can identify independent and dependent variables to identify causal relationships. • Understand what type of scientific enquiry is needed to answer and prove/disprove scientific questions or phenomenon. • Can give reasons, both orally and written, for the most effective ways to perform a test.	• Can choose the type of enquiry needed to carry out their investigation/answer the scientific question. • Can pose and answer their own questions, controlling variables where necessary independently. • Can decide whether they need to increase the sample size for validity. • Can understand how to gather data to prove a prediction. • Can identify a range of factors which may affect their investigation. • Can explain, both orally and in written forms, why they chose to carry out their investigation in the way they did.

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		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observing and Measuring	**National Curriculum**		Observing closely using simple equipment. Identifying and classifying.		Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.		Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where necessary.	
	Observing: What does this look like?	• Explore the natural world making observations (e.g. seasons, weather, etc.) • Explore different equipment and finding out its uses are. • Know similarities and differences between things in the natural world around them. • Observe and describe what they see using everyday language.	• Can use appropriate senses, aided by equipment such as magnifying glasses, to make observations. • With help and prompting, observe changes over time and can describe the changes (e.g. seasons, plants). • Can identify and group, compare and contrast using observations, videos and photographs. • Can use observations to suggest ideas to answers and questions.	• Observe closely, using simple equipment. • Can identify a variety of plants and animals using observations. • Observe how different plants grow and record findings, including similar plants at different stages of growth and notice similarities and differences. • Use their observations and ideas to suggest answers to questions. • Observe through video, first-hand observations and measurement how different animals, including humans, grow and offer explanations. • Compare objects (materials) based on observable features.	• Can make systematic and careful observations. • Look for naturally occurring patterns and relationships. • Collect data from their own observations and measurements. • Closely observe stages of plant life cycle over a period of time, noting patterns. • Observe how water is transported in plants. • Observe patterns in the way magnets behave in relation to each other. • Can make observations and decide how to record them to answer a scientific question.	• Can make systematic and careful observations to identify plants and animals in their habitats and how the habitat changes throughout the year. • Can use observations to ask questions and group objects using classification keys. • Observe closely and describe processes, such as changes of state. • Observe and record evaporation over a period of time. • Identify differences, similarities or changes related to simple scientific ideas or processes.	• Can observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world. • Observe changes over a period of time (e.g. animals, plants). • Can make own decisions about what to observe and when.	• Children answer their own and others' questions on observations they have made. Their answers are based on evidence. • Can observe and raise questions about animals and how they are adapted to their environment. • Can observe living things to group and classify based on their characteristics.

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	Measuring: What does this look like?	• Take measurements initially by comparisons then begin to use non-standard units. • Make links and notice patterns in their experiences and investigations.	• Use discrete (e.g., counting) and continuous data (e.g. liquid) to measure in common standard units. • Can use simple measurements and equipment such as hand lenses and timers to gather data. • Can use non-standard measures to compare and seek patterns.	• Use standard units to estimate and measure length, height, temperature, and capacity. • Can use rulers, scales, thermometers and measuring vessels with some degree of accuracy. • With support, make decisions about what measurements to use and how long to make them for.	• Take accurate measurements using standard units. • Can measure and compare. (e.g., amount of liquid and height of a plant to nearest *1⁄2* cm). • Use a range of equipment for measuring time, length, capacity and temperature, beginning to use a range of scales.	• Can use a range of scales. • Takes and records accurate measurements using standard units. • Can record measurements to 2dp (where applicable). • Can use and read thermometers to explore the effects of temperature on substances. • Use data loggers to record sound in decibels and observe patterns. • Use voltmeters to measure voltage in a circuit to observe patterns and answer questions. • Begin to gather repeat readings to increase accuracy, understanding why scientists do this.	• Can take repeat measurements where appropriate. • Can choose the middle value or can find the mean/average. • Select measuring equipment to give most precise results for the investigation e.g., ruler, tape measure, trundle wheels, force metres with suitable scales. • Can explain advantages and disadvantages of different measuring equipment in relation to the investigation. • Can make quantitative measurements about conductivity and insulation.	• Can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. • When collecting measurements, can decide whether they need to increase sample size for validity and reliability. • Can record measurements to 3dp in increase accuracy. • Can use protractors, rulers and force metres to measure accurately, choosing correct units.

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		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recording Results	**National Curriculum**		Gathering and recording data to help in answering questions. Identifying & classifying.		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.		Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	
	Diagrams, Scientific Drawings and Representations	• Draw pictures of objects/investigations in their own environment, verbally explaining their picture.	• Begin to show accuracy in drawings and use simple labels and/or captions. • Use key scientific vocabulary provided by the teacher.	• Can record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • Record findings using scientific language.	• Record findings using scientific language, drawings and labelled diagrams, with increasing independence.	• Record findings using systematic and careful observational drawings and labelled diagrams, with increasing accuracy.	• Can decide when to use scientific and observational drawings, with increasing accuracy and appropriate vocabulary.	• Can accurately draw scientific diagrams and labels, using appropriate vocabulary independently.
	Recording	• Can take photographs of investigations or phenomena that they have experienced in their environment.	• With support from the teacher, can record simple data to help answer questions.	• With increasing independence, can gather and record data to help in answering questions.	• Can gather and record data to answer questions in a variety of ways.	• With support, can present the same data in different ways. • Begin to have a choice over recording (options given).	• Children decide how to record data from a choice of familiar approaches. • Present results in a variety of ways to help in answering questions.	• Can present the same data in different ways to help answer a question. • Can record data and results with increasing complexity e.g., accuracy of measurements, multiple data sets and different scales.
	Sorting	• Can order items. • Can sort items in more than 2 groups using familiar categories.	• Can using sorting rings to classify in more than 2 groups, answering yes or no questions. • Can sort using a simple 2 criteria Venn diagram.	• Can identify and classify using simple keys based and yes or no questions. • Can sort into 2 groups, verbally explaining their reasons clearly.	• Can use simple classification keys and Venn diagram with 2 sorting criteria and 1 intersecting. • With support, can begin to use Carroll diagrams. • Can give reasons for their sorting criteria.	• With support, can record using classification keys. • Can use Venn and Carroll diagrams for classification, choosing own criteria.	• Can use and develop classification keys and other information. • Can record to identify, classify and describe. • Can classify in a number of ways.	• Can use and produce classification keys independently by posing their own questions.

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	Tables and Charts	• With support, can count results. • Can start to mark make to record results.	• With support, can complete a simple table of results (prepared and clearly modelled by the teacher). • Can add marks to a chart to collect data.	• Can count results using a tally chart. • Can use prepared tables to record results.	• Can complete a table (with given template) where they add headings (with support) and results.	• Can create own tables with own headings. • Can convert between units of measure.	• Can produce own results table indicating cause and effect. • Can record results systematically.	• Can calculate the mean and range of a set of data and add this to a table. • Can record multiple data sets.
	Graphs	• Can create a class chart using pictures and objects.	• Can complete a pre-prepared block graph/pictogram.	• Can record using pre-prepared vertical bar charts. • Can use results from tally charts to inform their graph.	• Can produce vertical and horizonal bar charts, adding own axis labels and bars.	• Can use discrete and continuous data to, with support, present data in a line/scatter graph. • Can construct a pictogram/bar chart independently, with appropriate axis labels.	• Can use line or scatter graphs to calculate range in a set of data. • Can produce bar graphs with various increments independently, with appropriate axis labels.	• Can independently collect data and produce scatter and line graphs using various scales and multiple data. • Can create bar charts with various increments independently. • Can create pie charts to present data.

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Interpreting Results

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum		Using their observations and ideas to suggest answers to questions.		Reporting on findings from enquiries, including oral and written explanations, displays, or presentations and raise further questions. 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.		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 presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.	
What does this look like?	• Can offer explanations for why things happen, making use of some recently introduced, taught scientific vocabulary. • Develop own narrative and explain ideas by connecting ideas or events. • Develop vocabulary which meets the breadth of their experiences.	• Can use evidence from simple tests when answering questions. • With support, can begin to notice patterns and relationships in data. • Can talk about what they have found out and how they found it out during an investigation. • Can make comparisons and recognise biggest/smallest, most effective/least effective from collected data.	• Can communicate findings using relevant scientific language and illustrations. • Can identify casual relationships and patterns in results. • Can identify which results do not fit the overall pattern and explain findings. • Can refer to the table of results when describing what has happened. • Can verbally state a basic conclusion (with support from the teacher) using own scientific knowledge, observations and comparisons. • Can use results of investigations to answer enquiry questions.	• Begin to look for naturally occurring patterns and relationships from data. • Can draw conclusions based on observations. • Can compare using results and the conclusion is consistent with the data. • Can change opinion and predictions based on results. • Can give reasons for results, including beginning to think about any anomalies. • Can use findings and results to answer questions raised. • Can use taught scientific language to discuss ideas and communicate their findings in ways appropriate for different audiences, both orally and written. • Can apply their knowledge of the topic when evaluating. • Can explain any amendments and how this impacted the investigation/test.	• Can draw simple conclusions from results to answer questions and support their ideas. • Can look for casual relationships in data and identify evidence that refutes/supports ideas. • Can report on findings to an audience, both orally and in writing, using appropriate scientific vocabulary for a range of audiences. • Can use evidence to suggest values for different items tested using the same method. • Can draw conclusions based on straightforward evidence and current subject knowledge to support their findings. • Can suggest improvements and raise further questions to be tested.	• Can identify patterns and casual relationships that may be found in the natural environment. • Can interpret data to generate simple comparative statements based on evidence. • Can use results to draw conclusions and can identify external factors that cannot be controlled (e.g. temperature inside and outside) that may have impacted on results. • Can use scientific language and illustrations to discuss, communicate and justify scientific ideas and findings. • Can use results to make future predictions and identify whether further observations, comparative tests, fair tests, pattern seeking, or research might be needed. • Can use comparative statements to explain results and how things work. • Can evaluate how effectively variables were controlled.	• Can use oral and written forms to report conclusions, casual relationships and explain the reliability in their results. • Can pose further questions which can be answered by extending the enquiry. • Can make suggestions for ideas that can be explored using pattern seeking. • Can spot anomalies and identify results that do not fit the overall pattern, suggesting why these may have occurred. • Can use data to refute or support ideas and arguments. • Focuses on scientific reasons for overall patterns rather than a comparison. • Can use labelled diagrams to support explanations. • Can use ideas from secondary sources to support their ideas, choosing appropriately.

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		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evaluating	National Curriculum		Using observations and ideas to suggest answers to questions.		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Using straightforward evidence to answer questions or to support their findings.		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 presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.	
	What does this look like?	• Can develop own narrative and explanations by connecting ideas or events. • Can talk about what they have found and say what worked well. • Can describe how things work in simple terms and make basic alterations and suggest things that did not work (e.g. this button does not work so press this one). • Questions why things happen. • Can come up with alternative ways of answering questions through exploration. • Can say or indicate by smiley faces/scale if they have achieved the learning objective/answered the scientific question.	• With scaffolds and modelling from the teacher, can suggest improvements to their enquiries. • Can talk about some changes that could be made to enquires. • Can use simple success criteria to evaluate their tests or understanding against the learning objective/scientific question.	• With support, can suggest improvements to their enquiries. • Can suggest some things that could be changed and evaluate why things went wrong. • Can use multiple success criteria to evaluate the test or their understanding against the learning objective/scientific question.	• Can suggest improvements to enquires and raises further questions. • Can use evidence and subject knowledge to refute statements. • Can make basic statements about what worked well and what they would change if they were to repeat the test. • Can use success criteria confidently to evaluate their tests or understanding against and suggest simple next steps.	• Can evaluate and communicate their methods and findings. • Can suggest ways to improve what they have already done. • Can begin to evaluate different aspects of their enquiries such as equipment. • Can begin to understand how the enquiry type improves outcomes from their questions. • Can use different charts to evaluate such as ranking scales, star diagrams and success criteria. • Can suggest points for development based on the weakest aspects.	• Can evaluate and decide when further observations, comparative and fair tests might be needed and why. • Can evaluate different aspects of their enquiries such as equipment and accuracy of measurements. • Can state how the enquiry type improves outcomes from their questions. • Can relate their results to the question and state if their test has enabled them to answer it. • Can use a range of charts to evaluate such as ranking scales, star diagrams including those with negative numbers. • Can suggest next steps based on the weakest aspects and state how this will help them or the test progress or give different results.	• Can describe and evaluate their own and other people's scientific ideas using evidence from a range of sources. • Can evaluate their choice of method, the control of variables, the precision and accuracy of measurements. • Can evaluate the credibility of secondary sources. • Can use scientific language and evaluates how their enquiry has answered the question.