



## Romero Science Working Scientifically Progression Map

Working Scientifically Skills	EYFS Understanding the world	Year 1 and 2	Year 3 and 4	Year 5 and 6
Asking questions and recognising that they can be answered in different ways	-show curiosity and ask questions make observations using their senses and simple equipment -make direct comparisons -use equipment to measure -record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets	-Asking <b>simple</b> questions and recognising that they can be answered in different ways - While exploring the world, the children develop their <b>ability to ask questions</b> (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. -The children <b>answer questions developed with the teacher</b> often through a scenario. - The children are <b>involved in planning</b> how to use resources provided to answer the questions <b>using different types of enquiry</b> , helping them to recognise that there are different ways in which questions can be answered.	-Asking <b>relevant</b> questions and using different types of scientific enquiries to answer them - The children consider their <b>prior knowledge when asking questions</b> . They independently use a range of question stems. Where appropriate, they answer these questions. -The children <b>answer questions posed by the teacher</b> . -Given a range of resources, the children <b>decide for themselves how to gather evidence to answer</b> the question. They recognise when <b>secondary sources</b> can be used to answer questions that cannot be answered through practical work. They <b>identify the type of enquiry</b> that they have chosen to answer their question.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.  -Children <b>independently ask scientific questions</b> . This may be stimulated by a scientific experience or involve <b>asking further questions</b> based on their developed understanding following an enquiry. -Given a <b>wide range of resources</b> the children <b>decide for themselves</b> how to gather evidence to answer a scientific question. They <b>choose a type of enquiry</b> to carry out and <b>justify their choice</b> . They recognise <b>how secondary sources</b> can be used to answer questions that cannot be answered through practical work.
Making observations and taking measurements	- use their observations to help them to answer their questions - talk about what they are doing and have found out -identify, sort and group.	- <b>Observing closely, using simple equipment</b> -Children explore the world around them. -They make <b>careful observations to support identification, comparison and noticing change</b> . They use appropriate senses, aided by equipment such as <b>magnifying glasses or digital microscopes</b> , to make their observations. -They <b>begin to take measurements</b> , initially by comparisons, then using <b>non-standard units</b> .	<b>Making systematic and careful observations</b> and, where appropriate, taking <b>accurate measurements using standard units</b> , using a range of equipment, including <b>thermometers and data loggers</b> . -The children make <b>systematic and careful observations</b> . -They use a <b>range of equipment for measuring length, time, temperature and capacity</b> . They use <b>standard units</b> for their measurements.	- <b>Taking measurements</b> , using a range of scientific equipment, with increasing <b>accuracy and precision</b> , taking repeat readings when appropriate - The children <b>select measuring equipment</b> to give the most <b>precise results</b> e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. - <b>During an enquiry, they make decisions</b> e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
Engaging in practical enquiry to answer questions		<b>Performing simple tests</b> - The children <b>use practical resources provided</b> to gather evidence to answer questions generated by themselves or the teacher. - They carry out: <b>tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Identifying and classifying</b> -Children <b>use their observations and testing to compare</b> objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. -They <b>use simple secondary sources</b> (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	<b>**Setting up simple practical enquiries, comparative and fair tests</b>  - The children <b>select from a range of practical resources</b> to gather evidence to answer questions generated by themselves or the teacher.  -They follow their plan to carry out <b>observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking</b> .	<b>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</b> - The children select from a range of practical resources to gather evidence to answer their questions. <b>They carry out fair tests, recognising and controlling variables</b> . -They <b>decide</b> what observations or measurements to make over time and for how long. They <b>look for patterns</b> and relationships using a suitable sample.
Recording and presenting evidence		<b>Gathering and recording data to help in answering questions</b> - The children <b>record their observations</b> e.g. using <b>photographs, videos, drawings, labelled diagrams</b> or in writing. - They <b>record their measurements</b> e.g. using prepared <b>tables, pictograms, tally charts and block graphs</b> . - -They <b>classify</b> using <b>simple prepared tables and sorting rings</b>	<b>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</b> -Recording findings using <b>simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</b> -The children sometimes decide how to record and present evidence. -They <b>record their observation</b> e.g. using <b>photographs, videos, pictures, labelled diagrams or writing</b> . -They <b>record their measurements</b> e.g. using <b>tables, tally charts and bar charts</b> (given templates, if required, to which they can add headings). -They record classifications e.g. using <b>tables, Venn diagrams, Carroll diagrams</b> . - Children are <b>supported to present the same data in different ways</b> in order to help with answering the question.	<b>Recording data and results of increasing complexity</b> using <b>scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</b>  -The children <b>decide how to record and present evidence</b> . -They <b>record observations</b> e.g. using <b>annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing</b> . -They <b>record measurements</b> e.g. using <b>tables, tally charts, bar charts, line graphs and scatter graphs</b> . -They record classifications e.g. using <b>tables, Venn diagrams, Carroll diagrams and classification keys</b> . -Children <b>present the same data in different ways</b> in order to help with answering the question.



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Answering questions and concluding		<p>Using their observations and ideas to <b>suggest answers</b> to questions</p> <ul style="list-style-type: none"><li>-Children use their experiences of the world around them to <b>suggest appropriate answers to questions</b></li><li>- They are <b>supported to relate these to their evidence</b> e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.</li></ul> <p>Using their observations and ideas to <b>suggest answers</b> to questions</p> <ul style="list-style-type: none"><li>- The children recognise 'biggest and smallest', 'best and worst' etc. from their data.</li></ul>	<p>Using <b>straightforward scientific evidence</b> to <b>answer</b> questions or to support their findings.</p> <ul style="list-style-type: none"><li>-Children <b>answer their own and others'</b> questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The <b>answers are consistent with the evidence</b>.</li></ul> <p>Identifying <b>differences, similarities or changes</b> related to simple scientific ideas and <b>processes</b>.</p> <ul style="list-style-type: none"><li>-Children <b>interpret their data</b> to <b>generate simple comparative statements</b> based on their evidence. They begin to <b>identify naturally occurring patterns and causal relationships</b>.</li><li>-Using <b>results to draw simple conclusions</b>, make predictions for new values, suggest improvements and raise further questions</li><li>- They <b>draw conclusions based on their evidence</b> and current subject knowledge</li></ul>	<p>Identifying <b>scientific evidence</b> that has been <b>used to support or refute ideas or arguments</b></p> <ul style="list-style-type: none"><li>- Children <b>answer their own and others'</b> questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they <b>discuss whether other evidence</b> e.g. from other groups, secondary sources and their scientific understanding, <b>supports or refutes their answer</b>.</li><li>- They <b>talk about how their scientific ideas change</b> due to new evidence that they have gathered.</li><li>- They <b>talk about how new discoveries</b> change scientific understanding.</li></ul> <p>Reporting and presenting findings from enquiries, including <b>conclusions, causal relationships and explanations of and degree of trust in results</b>, in oral and written forms such as displays and other presentations.</p> <ul style="list-style-type: none"><li>-In their conclusions, children <b>identify causal relationships and patterns in the natural world</b> from their evidence; <b>identify results</b> that do not fit the overall pattern and <b>explain their findings</b> using their subject knowledge</li></ul>
Evaluating and raising further questions and predictions			<p>Using <b>results</b> to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>They <b>identify</b> ways in which they <b>adapted their method</b> as they progressed or how they <b>would do it differently</b> if they repeated the enquiry.</p> <p>Using <b>results</b> to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"><li>- Children <b>use their evidence to suggest values</b> for different items tested using the same method e.g. the distance travelled by a car on an additional surface.</li><li>- Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.</li></ul>	<p>Reporting and presenting findings from enquiries, including <b>conclusions, causal relationships and explanations of and degree of trust in results</b>, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"><li>- They <b>evaluate</b>, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the <b>credibility of secondary sources used</b>.</li><li>-They <b>identify any limitations</b> that reduce the trust they have in their data.</li></ul> <p>Using <b>test results</b> to make predictions to <b>set up further comparative and fair tests</b></p> <ul style="list-style-type: none"><li>- Children <b>use the scientific knowledge</b> gained from enquiry work to make predictions they can investigate using <b>comparative and fair tests</b></li></ul>
Communicating their findings			<p>Reporting <b>on findings</b> from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"><li>- They <b>communicate their findings</b> to an audience both orally and in writing, using appropriate scientific vocabulary.</li></ul>	<p>Reporting and presenting findings from enquiries, including <b>conclusions, causal relationships and explanations of and degree of trust in results</b>, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"><li>-They <b>communicate their findings</b> to an audience using <b>relevant scientific language and illustrations</b>.</li></ul>

\*\*EYFS - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

\*\* **Explanatory note** - A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.