Harefield Working Scientifically Skills Progression (created using plan.com assessment resources and Hamwic documents)

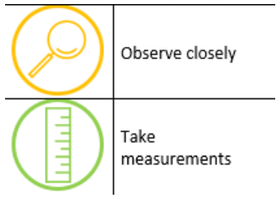
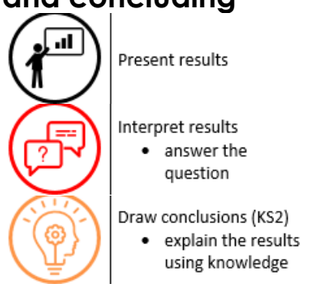
	EYFS	KS1	LKS2	UKS2
Asking questions and recognising that they can be answered in different ways **Engaging in practical enquiry to answer questions** 	Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. Make comments about what they have heard and ask questions to clarify their understanding.	**Asking simple questions and recognising they can be answered in different ways** Year 1 – Raise questions about the world around them and begin to recognise that they can be answered in different ways (i.e. by observing, researching etc.). Answer questions developed with support of the teacher. Year 2 – Ask questions that include scientific language and recognise that they can be answered in different ways (i.e. by observing, researching etc.). Begin to use simple secondary sources to answer questions (books, technology) **Performing simple tests** (They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time) Year 1 – Children have experience different types of scientific enquiries. Teacher models how to use resources provided to gather evidence to answer questions generated by themselves or the teacher. Teacher states the type of enquiry used. Year 2 – Children have experience different types of scientific enquiries. Children are involved in planning how to use resources provided to answer the questions using different types of enquiry. Teacher states the type of enquiry used. **Identifying and classifying** Year 1 – Children use their observations and testing to compare objects, materials and living things.With help , they sort and group these things according to given criteria. Year 2 - Children use their observations and testing to compare the simple features of objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.	**Asking relevant questions and using different types of scientific enquiries to answer them** Year 3 – Children independently use a range of question stems. Children consider prior knowledge when asking questions. Ask questions related to their scientific experiences and use different types of enquiry to answer them. With teacher support, children identify the type of enquiry they are using to answer a question. Year 4 – Ask relevant scientific questions and use different types of enquiry to answer them. Given a range of resources, the children decide for themselves how to gather evidence to answer a question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They can identify the type of enquiry that they have chosen to answer their question. Identify when fair tests are necessary and help decide how to set it up. **Setting up simple practical enquiries, comparative and fair tests** (They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; pattern seeking enquiries; and observations over time) Year 3 – Plan their enquiry with support of the teacher. The children select from a range of practical resources to gather evidence to answer questions generated by themselves of the teacher. Year 4 – They plan their enquiries in groups (with teacher support if necessary). Children begin to suggest their own practical resources to gather evidence to answer questions.	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** Year 5 – Use scientific experiences to explore ideas and raise different types of questions. Given a wide range of resources, decide for themselves how to gather evidence to answer a scientific question. They chose the type of enquiry to carry out and justify their choice. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample. Year 6 – Recognise which secondary sources will be most useful to research their ideas and begin to separate fact from opinion. Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. Plan different types of enquiries to answer their own and others questions, including carrying out fair tests by recognising and controlling variables where necessary.

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 a material or the area of a canopy. This leads to establishing a causative relationship.

		They use simple secondary sources (i.e. identification sheets) to name living things. They describe the characteristics the used to identify a living thing.		
Recording and presenting evidence  Gather and record results  Present results	Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.	**Gathering and recording data to help in answering questions** Year 1 – Children record their observations using photographs, videos, drawings or in writing. Children record their measurements in simple pre-prepared tables. They classify using simple prepared tables and sorting rings. Record data in pictograms (if still taught in Maths), lists, tables. Children make simple explanations (verbally recorded by teacher). Year 2 - Children record their observations using photographs, videos, drawings, labelled diagrams (with teacher support) or in writing. Children record their data using pre-prepared tables, pictograms, tally charts and block graphs. They classify using simple prepared tables and sorting rings. Gather and record data to help in answering questions, including from secondary sources of information. Children begin to record their own simple explanations in writing. Children communicate ideas: what they do and what they find out, in a variety of ways.	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** Year 3 – Teacher supports children to decide how to record and present evidence (class/ group discussions). Children independently record observations using photos, videos, pictures, labelled diagrams or writing. They independently record their measurements using tables, tally charts and bar charts (given templates, if required, to which they can add headings). With teacher support, they record classifications using Venn diagrams and Carroll diagrams. Year 4 – Children sometimes decide how to record and present evidence. Children independently record observations using photos, videos, pictures, labelled diagrams or writing. They independently record their measurements using tables, tally charts and bar charts (given templates, if required, to which they can add headings). Independently, they record classifications using tables, Venn diagrams and Carroll diagrams. Children should talk about criteria for grouping, sorting and classifying. Children are supported to present the same data in different ways in order to help with answering the question. **Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables** Year 3 – Interpret and present data using bar charts, pictograms and tables (Year 3 Maths: Stats). Children begin to use scientific language taught when recording their findings. Year 4 – Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs (Year 4 Maths: Stats).	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** Year 5 – Children present the same data in different ways in order to help with answering the question. Children decide how to record and present evidence. They independently record observations using annotated photographs (with teacher support), videos, labelled diagrams, observational drawings (with support), labelled scientific diagrams (with support) or writing. They record measurements using tables, tally charts, bar charts, line graphs (with support) and scatter graphs (with support). They record classifications using tables, Venn diagrams, Carroll diagrams and classification keys (with support). With support = TEACH SKILL Year 6 - Children present the same data in different ways in order to help with answering the question. Children decide how to record and present evidence. They independently record observations using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications using tables, Venn diagrams, Carroll diagrams and classification keys.

			Children use scientific language taught when writing their own findings.	
Making observations and taking measurements 	Explore the natural world around them, making observations and drawing pictures of animals and plants.	**Observing closely, using simple equipment** Year 1 – Children explore the world around them. They make careful observations (with support of teacher questioning) to support identification, comparison and noticing change. They use appropriate senses to make their observations. They begin to take simple measurements, initially by comparison, then using non-standard units (big, small, bigger, smaller, louder, faster, steps, cubes, hands/feet, cups, spoons, drops) Year 2 – They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially using non-standard units moving to equipment with simple scales (2s, 5s, 10s) to measure in standard units (cm, temperature). Use digital equipment to measure weight / temperature.	**Make systematic and careful observations, and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** Year 3 – Make systematic and careful observations. Use a range of equipment for measuring length, time, temperature and capacity. Use standard units for their measurements. Measure lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). Year 4 - Make systematic and careful observations. Where appropriate take accurate measurement using standard units (Measure lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)). Use a range of equipment including data loggers. Children should help to make decisions about what observations to make, how long to make the for and the type of simple equipment that might be used.	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat reading where appropriate** Year 5 – Take measurements using scientific equipment such as force meters, measuring cylinders and stop watches with increasing accuracy and precision. Take temperature measurements including negative numbers. Year 6 – Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with suitable scale. During an enquiry, they make decisions 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).
Answering Questions and concluding 	Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.	**Using their observations and ideas to suggest answers to questions** Year 1 – Children tell others what they did and what they found out. Children use their experiences of the world around them to suggest appropriate answers to questions. The children can recognise 'biggest and smallest', 'best and worst' etc from their data with adult support. Year 2 – Children are supported to relate their appropriate answers to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children can recognise 'biggest and smallest', 'best and worst' etc from their data. Children	**Use straightforward evidence to answer questions or support their findings** Year 3 – Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. Use evidence to explain what happened and why it happened. Year 4 – Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources and these answers are consistent with the evidence. Use evidence to draw	**Identifying scientific evidence that has been used to support or refute ideas or arguments** Year 5 – Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they (with teacher support) discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. With teacher support and guidance, they talk about how their scientific ideas change due to new evidence they have gathered and how new discoveries change scientific understanding.

		can notice similarities, differences and patterns in their data. Children explain what happened, what you found out and why this is the case using the scientific knowledge they have so far.	conclusions, explaining what you found out and why you believe it to be true. **Identifying differences, similarities or changes related to simple scientific ideas and processes** Year 3 – With teacher support, children interpret their data to generate simple comparative statements based on their evidence. Year 4 – Independently, children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** Year 3 – With teacher support, they draw conclusions based on their evidence and current subject knowledge. Year 4 – Independently, they draw conclusions based on their evidence and current subject knowledge.	Year 6 – Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they (independently) discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence they have gathered and how new discoveries change scientific understanding. **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.** Year 5 – In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge with teacher support. Draw conclusions, explaining what you have learned from the enquiry referring to evidence and data from the enquiry. Year 6 – In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. Share what you have found out and why you believe this to be the case clearly and succinctly.
Evaluating and raising further questions (KS2 ONLY)  Draw conclusions (KS2) • explain the results using knowledge  Make a prediction (KS2)		*Year 1 – With teacher support, as part of a verbal class discussion, children consider in advance what might happen or what they might found out. With teacher support, as part of a verbal class discussion, children recall what went wrong and why.* *Year 2 - With teacher support, as part of a verbal class discussion, children consider in advance what might happen or what*	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** Year 3 – With teacher support, they identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. With teacher support, children use their evidence to suggest values for different items tested using the	**Use test results to make predictions to set up further comparative and fair tests** Year 5 – With support, children use the scientific knowledge they gained from enquiry work to make predictions they can investigate using comparative and fair tests. Year 6 – Children use the scientific knowledge they gained from enquiry

 Evaluate an enquiry (KS2)		*they might found out and know this as a prediction. With teacher support, as part of a verbal class discussion, children recall what went wrong, why and how you could avoid this in the future.*	same method e.g., the distance travelled by a car on an additional surface. Year 4 – They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Children use their evidence to suggest values for different items tested using the same method e.g., the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	work to make predictions they can investigate using 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.** Year 5 – They evaluate, for example, the choice of method used, the control of variables and the precision and accuracy of measurements. Year 6 – They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. They identify any limitations tat reduce the trust they have in their data.
Communicating their findings (KS2 ONLY)  Present results  Draw conclusions (KS2) • explain the results using knowledge  Evaluate an enquiry (KS2)			**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** Year 3 – They communicate their findings to an audience both orally and in writing, using appropriate scientific language. Year 4 – Oral explanations Written explanation Display presentation	**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.** Year 5 – They communicate their findings to an audience using relevant scientific language and illustrations. Year 6 -