Progression of Skills- Working Scientifically

	PLANNING AND TESTING *UKS2 - Using different types of scientific enquiry making decisions about and explaining choices for testing.* *LKS2 - Making decisions about and setting up simple practical enquiries, comparative tests and fair test.*	USING EQUIPMENT AND MEASURES *UKS2 - Increasing complexity and increasing accuracy and precision Make their own decisions about the data to collect.* *LKS2 - Making accurate measurements and gathering data.*	COMMUNICATING *UKS2 / LKS2 / KS1 Reporting findings, recording data, presenting findings.* *Read, spell and pronounce scientific vocabulary correctly linked to the relevant year group.*	DESCRIBING RESULTS / LOOKING FOR PATTERNS *UKS2 - Looking for patterns analysing functions, relationships and interactions more systematically.* *LKS2 - Describing their findings/ results.*	EXPLAINING RESULTS *UKS2 - Draw conclusions based on / supported by evidence.* *LKS2 - Reporting on findings saying why something happened*	TRUSTING RESULTS *UKS2 - Comment on how reliable the data is.* *LKS2 - Suggest improvements for further tests.*
Y1	1.With help, **carry out** a simple test/comparative test. 2.With help, make a simple prediction or suggestion about what might happen. 3.Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection. **4.Talk** about ways of setting up a test.	**1.Measure** using non-standard units e.g. how many lolly sticks/cubes/handfuls, etc. 2.Observe closely, using simple **equipment**(e.g. hand lenses, egg timers). 3.Use senses to **compare** different textures, sounds and smells.	1.Communicate their ideas to a range of audiences in a variety of ways. 2.Complete a pre-constructed table / chart using picture records or simple words. 3.Contribute to a class display. 4.Add annotations to drawings or photographs. 5.Begin to use some simple scientific language from Y1 PoS. **6.Record** simple visual representations of observations made.	1.Use recordings to talk about and describe what happened. 2.Sequence photographs of an event/observation.	1.Begin to use simple scientific language (from Y1 PoS) to talk about what they have found out or why something happened.	N/A
Y2	1.Carry out simple comparative tests as part of a group, following a **method** with some independence. 2.Make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct). 3.With support, make suggestions on a **method** for setting up a simple comparative test. 4.Talk about a practical way to find answers to their questions.	**1.Measure** using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy. 2.Begin to make decisions about which equipment to use. 3.Correctly and safely use **equipment** provided to make observations and/or take simple measurements.	**1.Record** and communicate their findings in a range of ways to a variety of audiences. 2.Use simple scientific language with increasing accuracy (from Y2 PoS). **3.Record** simple data with some accuracy to help in answering questions; With support or using frameworks, make decisions about how to complete a variety of tables/charts (e.g. a 2 column table, tally charts, Venn diagram,	1.With guidance, begin to notice **patterns** in their data e.g. order their findings, sequence best to worst, say what happened over time, etc. 2.Recognise if **results** matched **predictions** (say if results were what they expected). 3.Use their recordings to talk about and describe what has happened.	1.Begin to use simple scientific language (from Y2 PoS) to explain what they have found out. 2.Give a simple, logical reason why something happened (e.g. I think … because…).	▸ Begin to discuss if the test was unfair.

			pictograms, block graphs with 1:1 scale).vPresent findings in a class displays. Sequence / annotate photographs of change over time. Produced increasingly detailed drawings which are labelled/annotated.			
Y3	1.Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair. 2.Make a prediction based on everyday experience. 3.With support/as a group, set up simple practical enquiries including comparative and fair tests e.g. make a choice from a list of a things (variables) to change when conducting a fair test. (e.g. choose which magnets to compare and which method to use to test their strength). 4.As a group, begin to make some decisions about the best way of answering their questions.	1.Collect data from their own observations and measurements using notes/ simple tables/standard units. 2.Help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that might be used and how to work safely. 3.Make simple **accurate** measurements using whole number standard **units**, using a range of equipment. 4.Gather data in a variety of ways to help in answering questions. 5.Use equipment **accurate**ly to improve the detail of their measurements/observations(e.g. microscopes, measuring syringes, measuring cylinders, hand lenses).	1.Record and present findings using simple scientific language and vocabulary from the Y3 PoS, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations. 2.With scaffold / support record, and present data in a variety of ways to help in answering questions. Communicate their findings in ways that are appropriate for different audiences. (linked to Y3 PoS).	1.With scaffold/support, describe and compare the effect of different factors on something (e.g. we noticed that larger magnets are not always stronger). 2.With help, look for changes and simple patterns in their observations, data, chart or graph. 3.Use their results to consider whether they met their predictions.	1.Use their experience and some evidence or results to draw a simple conclusion to answer their original question. 2.Write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary from the Y3 PoS.	1.Say whether what happened was what they expected and notice any results that seem odd. 2.Begin to recognise when a test is not **fair** and suggest improvements.
Y4	1.Carry out simple fair tests with increasing confidence investigating the effect of something on something else (linked to Y4 PoS). 2.Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions (is a fair test the best way to investigate their question?) 3.Make a prediction based on the knowledge acquired from previous	1.Begin to identify where patterns might be found and use this to begin to identify what data to collect. 2.Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used. 3.Recognise obvious risks and how to keep themselves and others safe. 4.Learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius (°C)	1.Record findings using relevant scientific language and vocabulary (from Y4 PoS), including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations. 2.Begin to select the most useful	1.Notice / find patterns in their observations and data. (Describe the effect of something on something else). (e.g. as I lengthen the ruler I notice that the pitch gets lower). 2.With some independence, analyse results / observations by writing a sentence that matches the evidence i.e. deciding the important aspect of the result and summarising in a conclusion(e.g. metals tend to be good conductors of electricity).	1.Begin to develop their ideas about relationships and interactions between things and explain them. 2.Use relevant scientific language and vocabulary (from Y4 PoS) to begin to say / explain why something happened.	1.Use results to suggest improvements, new questions and/or predictions for setting up further tests. 2.Compare their results with others and give reasons why results might be different.

	explorations /observations and apply it to a new situation. 3.Explain their planning decisions and choices. 5.Make some of the planning decisions about what to change and measure/observe. 6.Begin to recognise when a fair test is necessary.	using a thermometer. 5.Collect data from their own observations and measurements, using notes / simple tables / standard units. 6.Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales.	ways to collect, record, classify and present data from a range of choices. 3.Make decisions on how best to communicate their findings in ways that are appropriate for different audiences.			
Y5	1.Carry our fair tests and other investigations with increasing independence. 2.Suggest more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the scientific concept. 3.Make decisions about which variables to change, measure and keep the same (linked to the appropriate units in the Y5 PoS). 4.Make most of the planning decisions for an investigation. 5.Recognise when it is appropriate to carry out a fair test.	1.Make their own decisions about what observations to make or measurements to use and how long to take them for (recognising the need for repeat readings on some occasions). 2.Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units. 3.Identify possible risks to themselves and others and suggest ways of reducing these. Choose the most appropriate equipment and make accurate measurements.	1.Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts (linked to Y5 PoS). 2.Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes. 3.Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models. 4.Make decisions about the most appropriate way of recording data.	1.Describe straightforward patterns in results linking cause and effect e.g. using er or the word 'more' (e.g. the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall). 2.Look for / notice relationships between things and begin to describe these. Comment on the results and whether they support the initial prediction.	1.Use their scientific knowledge and understanding and appropriate scientific language and terminology (linked to Y5 PoS) to explain their findings and data and answer their initial question. 2.Draw a valid **conclusion** (explain why it happened) based on their data and observations (from Y5 PoS).	1.Begin to recognise how repeated readings improve the reliability of results. 2.Compare results with others and comment on how reliable they are.
Y6	1.Predict what a graph might look like before collecting results. 2.Make a hypothesis where they say how one thing will affect another and give a reason for their suggestion with a developing understanding of the scientific concept. 3.Identify variables to change, measure and keep the same in order for a test to be fair.	1.Decide whether to repeat any readings and justify the reason for doing so. 2.Make their own decisions about what measurements to take (and begin to identify the ranges used). 3.Make, and act on, suggestions to control/ reduce risks to themselves and others. 4.Use equipment fit for purpose to take measurements which are	1.Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings (linked to the Y6 PoS). 2.Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models.	1.Spot unexpected results that do not fit the pattern (anomalies). 2.Identify patterns in results collected and describe them using the change and measure variables (causal relationships) (e.g. as we increased the number of batteries the brightness the bulb increased.	1.Identify evidence that refutes or supports their ideas. 2.Independently form a conclusion which draws on the evidence from the test (linked to Y6 PoS). Use scientific language and terminology (linked to Y6 PoS) to explain why something happened.	1.Be able to suggest reasons for unexpected results (anomalies). 2.Describe how to improve planning to produce more **reliable** results. 3.Say how confident they are that their results are reliable and give a reason.

	4.Independently plan investigations and explain planning decisions. Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.	increasingly accurate and precise. 5.Decide the most appropriate equipment to use to collect data.	3.Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology).			

	EXPLORING / OBSERVING	GROUPING AND CLASSIFYING	QUESTIONING	RESEARCH	MODELLING	COLLABORATING
	LKS2 - Developing their own ideas and their understanding of the world around them. ***KS1 - Observing closely*** ***Using their observations and ideas to suggest answers to questions.***	***LKS2 - Compare and contrast a variety of examples linked to LKS2 PoS.*** ***KS1 - Compare and contrast a variety of examples linked to KS1 PoS.***	***LKS2 - Asking relevant questions.*** ***KS1 - Asking simple questions.***	***LKS2 - Finding things out using a wide range of secondary sources of information.*** ***KS1 - Finding things out using secondary sources of information.***	***Non Statutory*** ***Using dance, drama or a visual aid to represent science in the real world.***	***Non Statutory*** ***Interacting effectively as part of a group.***
Y1	1.Begin to use simple scientific language (from Y1 PoS) to talk about or **record** what they have noticed. 2.Use observations to make suggestions and/or ask questions. 3.Look / **observe** closely and communicate changes over time. 4.Look / **observe** closely and communicate the features or properties of things in the real world. **5.Observe** closely using their	**1.Name**/identify common examples and some common features. 2.With help, decide how to sort and **group** objects, materials or living things. **3.Name** basic features of objects, materials and living things. 4.Say how things are similar or different. **5.Compare** and contrast simple observable features / characteristics of objects, materials and living things.	1.Ask simple questions about what they notice about the world around them. 2.Demonstrate curiosity by the questions they ask.	1.Ask people questions (e.g. an expert or hot-seating). 2.Use simple primary and secondary sources (such as objects, books and photographs) to find things out.	1.With help, follow movements (dance / drama) to act out their science.	1.Share ideas in a group and listen to the ideas of others. 2.Work with others on a science task.

	senses.					
Y2	1.Use simple scientific language from the Y2 PoS to talk about / **record** what they have noticed. 2.Use observations to make suggestions and/or ask questions. **3.Observe** and describe simple processes/cycles/changes with several steps(e.g. growth cycle, simple food chain, saying how living things depend on one another). **4.Observe** closely and communicate with increasing accuracy the features or properties of things in the real world.	**1.Name**/identify common examples and some common features. 2.With help, decide how to sort and **group** objects, materials or living things. **3.Name** basic features of objects, materials and living things. 4.Say how things are similar or different. **5.Compare** and contrast simple observable features / characteristics of objects, materials and living things.	1.Ask simple questions about what they notice about the world around them. 2.Demonstrate curiosity by the questions they ask.	1.Ask people questions (e.g. an expert or hot-seating). 2.Use simple primary and secondary sources (such as objects, books and photographs) to find things out.	1.With help, follow movements (dance / drama) to act out their science.	1.Share ideas in a group and listen to the ideas of others. 2.Work with others on a science task.
Y3	1.Observe and record relationships between structure and function (linked to Y3 PoS). 2.Observe and record changes /stages over time (linked to Y3 PoS). 3.Explore / observe things in the local environment / real contexts and record observations (linked to Y3 PoS) – see 'Communicating' section also re links to vocabulary.	1.Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics. 2.Compare and contrast and begin to consider the relationships between different things (e.g. structures of plants, functions of plant parts, diets, skeletons of humans and other animals, changes over time, etc.). 3.Record similarities as well as differences (e.g. what do all skeletons have? as well as the differences between skeletons.	1.Explore their own ideas about 'what if….?' scenarios e.g. humans did not have skeletons. 2.Ask questions such as 'What if we tried….? or 'What if we changed…?' 3.Begin to understand that some questions can be tested in the classroom and some cannot. 3.Within a group suggest questions that can be explored, observed, tested or investigated further. 4.Within a group suggest relevant questions about what they observe and about the world around them.	1.Find things out using a range of secondary sources of information (e.g. books, photographs, videos and other technology).	1.Act out or make a model of something to represent something in the real world using appropriate scientific vocabulary verbally.	1.Begin to make some decisions about an idea within a group from a list of choices (e.g. let's put them all in a pile first OR I think we should try…). 2.With help; support, listen to and acknowledge others in the group (e.g. Yes. I prefer that one too). 3.Build on / add to someone else's idea. (e.g. we could use x as well as y). 4.Begin to understand that it is okay to disagree with their peers and offer a reason for their opinion.
Y4	1.Suggest their own ideas on a concept and compare these with what they observe / find out. 2.Use observations to suggest what to do next.	1.Make a simple guide to local living things. 2.Use guides or simple keys to classify / identify [animals, flowering plants and non-flowering	1.Ask/raise their own relevant questions with increasing confidence and independence that can be explored, observed, tested or investigated further.	1.Make decisions about which information to use from a wide range of sources and make decisions about how to present their research. 2.Recognise when and how secondary	1.Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see. 2.Suggest their own ideas on a	1.Make some decisions about an idea within a group (e.g. I think we should find out by testing…) 2.Increasingly support, listen to and acknowledge others in the group.

	3.Discuss ideas and develop descriptions from their observations using relevant scientific language and vocabulary (from Y4 PoS). 4.Observe and record relationships between structure and function or between different parts of a processes(linked to Y4 PoS). 5.Observe and record changes /stages over time (linked to Y4 PoS).	plants]. 3.Use their observations to identify and classify. 4.Begin to give reasons for these similarities and differences. 5.Record similarities as well as differences and/or changes related to simple scientific ideas or processes or more complex groups of objects/living things/events (e.g. evaporation and condensation, different food chains, different electrical circuits).	2.Ask questions such as 'What will happen if…?" or 'What if we changed…? (linked with Y4 PoS). 3.Choose/select a relevant question that can be answered [by research or experiment / test].	sources might help them to answer questions that cannot be answered through practical investigations.	concept and compare these with models or images.	3.Build on / add to someone else's idea to improve a plan. 4.Understand that it is okay to disagree with their peers and offer reasons for their opinion.
Y5	1.Use their developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain their observations (incl. more abstract ideas from Y5 PoS (e.g. friction, air resistance, forces, Earth and space, reversible and irreversible changes). 2.Evaluate their observations and suggest a further test, offer another question or make a **prediction.** Observe (including changes over time) and suggest a reason for what they notice.	1.Suggest reasons for similarities and differences. 2.Compare and contrast things beyond their locality and use these similarities and differences to help to classify (e.g. features of animals, life cycles of different living things, melting compared with dissolving, etc). 3.Use secondary sources of information to identify and classify. 4.Decide which sources of information (and/or equipment and/or test) to help identify and classify.	1.Recognise scientific questions that do not yet have definitive answers (linked to Y5 PoS). 2.Refine a scientific question so that it can be tested e.g. 'What would happen to… if we changed…?' 3.Decide whether their questions can be answered by researching or by testing. 4.Independently ask their own scientific questions taking some ownership for finding out the answers.	1.Find out how scientific ideas have changed/developed over time (linked to Y5 PoS). 2.Articulate and explain findings from their research using scientific knowledge and understanding. 3.Make decisions about which information to use from a wide range of sources.	1.Perform / create simple models to exemplify scientific ideas using scientific terminology where appropriate (e.g. spheres to represent movements of the Sun and Earth, solar system models, shadow clocks, a simple lever or mechanism).	1.Propose their own ideas and make decisions with agreement in a group. 2.Support, listen to and acknowledge others in the group e.g. Yes. I prefer that one too. 3.Check the clarity of each other's suggestions e.g. are you saying you think this one is a herbivore? 4.Build on / add to someone else's idea to improve a plan or suggestion. 5.Understand that it is okay to disagree with their peers and offer a reasons for their opinion.
Y6	1.Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations and explorations (linked to Y6 PoS). 2.Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the	1.Recognise the importance of classification to the scientific world and form a conclusion from their sorting and classifying. 2.Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction). 3.Construct a classification key /	1.Recognise scientific questions that do not yet have definitive answers (linked to Y6 PoS). 2.Refine a scientific question to make it testable i.e. ask a testable question which includes the change and measure variables, e.g. what would happen to…if we	1.Research how scientific ideas have developed over time and had an impact on our lives. 2.Use evidence from a variety of sources to justify their ideas 3.Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.	1.Make / perform and use their own versions of simple models to describe and explain scientific ideas (e.g. circulatory system drama, periscopes to explain how light travels, burglar alarm to explain components in a circuit).	1.Propose their own ideas and make decisions with agreement in a group. 2.Support, listen to and acknowledge others in the group. 3.Check the clarity of each other's suggestions. 4.Build on / add to someone else's idea to improve a plan or

	world. 3.Explore more abstract systems / functions /changes / behaviours and record their understanding of these (e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels).	branching database using more than two items. 4.Compare and contrast things beyond their locality and discuss advantages/disadvantages, pros/cons of the similarities and differences. 5.Use research* to identify and classify things. 6.Use classification systems, keys and other information records [databases] to help classify or identify things.	changed…? e.g. What effect would we have on … if we…? e.g. How would exercise affect the pulse rate? 3.Use observations to suggest a further (testable or research) question. 4.Independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.	4.Interview people to find out information		suggestion. 5.Understand that it is okay to disagree with their peers and offer reasons for their opinion.